**ARBITER SYSTEMS**

# -DISCONTINUED PRODUCT-

## Internal Network Time Protocol Server
**Available for Models 1084, 1088, and 1093**

The Internal Network Time Protocol Server option allows an Arbiter Systems®, Inc. GPS Satellite-Controlled Clock to act as a time server over an ethernet network using the Network Time Protocol (NTP). Operating as a primary or stratum 1 server (symmetric operation modes are not supported), time is distributed to connected systems, such as workstations, PCs, servers and routers via the Ethernet interface(s). The Internal Network Time Protocol Server understands NTP version 1, version 2 and version 3 frames while optionally supporting authentication via DES and MD5 cryptographic checksums as defined in RFC 1305. Typical accuracy for the NTP server is one millisecond on a LAN to a few tens of milliseconds on a WAN as compared to UTC (Coordinated Universal Time); accuracy will vary depending upon network traffic.

### Principles of Operation

Synchronizing a client to a network server consists of several packet exchanges where each exchange is a pair of request and reply. The client stores its local time into the packet being sent. The server receives the packet and then stores its own estimate of the current time into the packet and returns the updated packet. The client receives the updated packet and will once more log its own receipt time to estimate the travelling time of the packet.

These time differences are used to estimate the time it took for the packet to be transmitted from the server to the requestor. That round-trip time is taken into account when estimating the current time. The shorter the round-trip time, the more accurate the estimate of the current time.

It takes several packet exchanges before the client believes the server time is correct. Only when the replies from the server satisfy the conditions defined in the protocol specification, is the server considered valid. Time cannot be synchronized from a server that is considered invalid by the protocol. Multistage filters are used to estimate the quality of the time samples. Usually it takes about five minutes (five good samples) until an NTP client is synchronized to a server.

The quality estimate of a client, obtained using multistage filtering, usually improves over time. If the client has a more accurate estimate than a server, such a server may be considered invalid after some time.

Time can be passed from one time source to another, typically starting from a reference clock connected to a stratum 1 server. Servers synchronized to a stratum 1 server will be stratum 2. Generally the stratum of the server will be one more than the stratum of the reference.

### Specifications

**Performance**

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|---|---|
| Accuracy | Less than one millisecond, depending on network load and clock accuracy |
| Management | Serial and Telnet login |

**System Interface**

| | |
|---|---|
| Network | One (1) or two (2) RJ45 (10/100Base-T) Option 32 or Option 33 respectively |
| Compatibility | Ethernet Version 2.0/IEEE 802.3 |
| Protocols | IP-ARP, UDP, ICMP, SNMP, TCP, TFTP, NTP |
| Serial | RS-232; 1200 to 19,200 baud; 7 or 8 data bits; 1 or 2 stop bits; even/odd/no parity |
| | RJ11 connector |

**Operator Interface**

| | |
|---|---|
| Status LEDs | Synch (green) Fault (red) Link (green) |
| Setup | IP number Net Mask Gateway UDP Broadcast parameters (port, interval, up to eight target addresses) MD5 and DES authentication keys are optional |