

# TimeKeeper® GrandMaster Second Generation

The **TimeKeeper GrandMaster Second Generation** is a time serving appliance designed for high frequency trading and other financial applications that leverages the capabilities and cost-advantages of commodity hardware to combine exceptional performance with a significant price reduction compared to traditional products.

## What's New

The latest generation TimeKeeper GrandMaster builds on the stability and accuracy of the previous platform and expands capacity, accuracy and provides more options.

## New Features

- ▶ Multi-GNSS receiver can track GPS, GLONASS, Beidou and Galileo
- ▶ 2x 25/10/1G network ports standard (previously 10/1G)
  - ▶ Up to 4x 25/10/1G network ports available
  - ▶ 6x 25/10/1G ports coming soon
- ▶ SFP+ ports replaced with SFP28
- ▶ Improved oscillator with 4 us/day holdover (previously 25)
  - ▶ Optional Rubidium oscillator with 0.6 us/day holdover
- ▶ More convenient SMA connectors for antenna, 10Mhz and PPS input/output (previously BNC)
- ▶ Increased capacity for more client load



## Security from the ground up

TimeKeeper GrandMasters are able to track multiple sources of time as cross checks and are able to detect GNSS spoof attacks, jamming attacks and equipment failures.



## Flexible Server Configuration

The web interface simplifies configuration. For example: the clock can be easily setup to use a PTP source as a backup to the on-board GNSS and multiple NTP/PTP source as cross checks.



## Transparent Failover

GrandMasters can be setup to back up each other so that if one has a failure time service continues.



## Enterprise Reliability

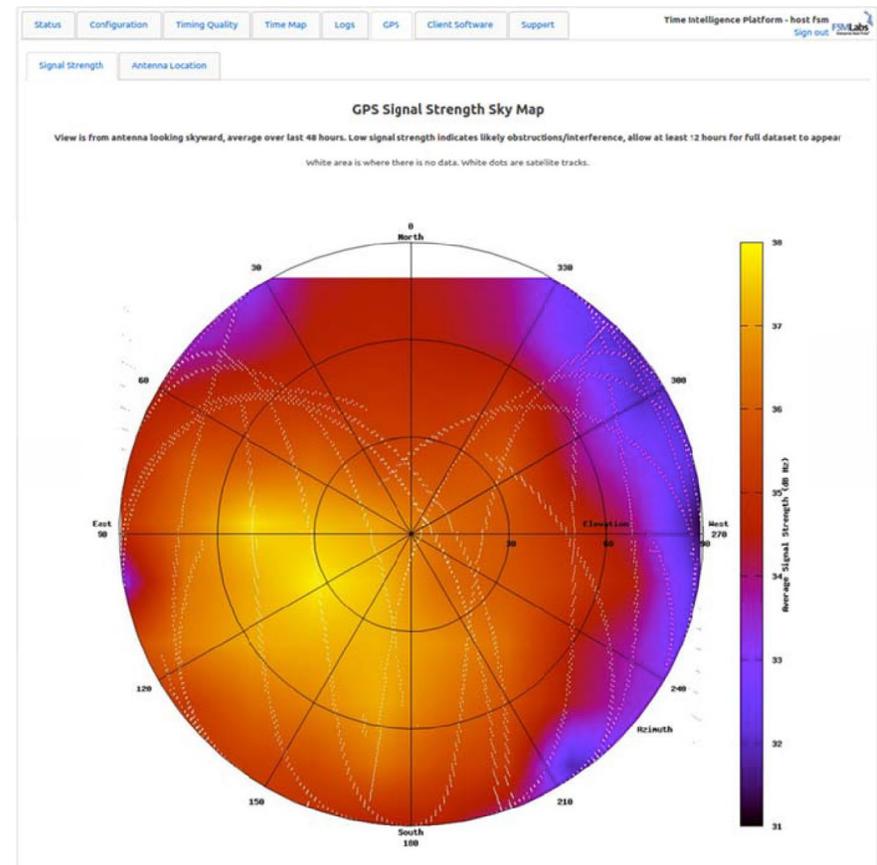
Includes hot-swap power supplies, multiple network ports, redundant storage, client monitoring and multi-source redundancy



## Standard Features

- ▶ Dual, redundant hot-swappable AC power supplies and storage
- ▶ PTP, NTP on all ports - low 100's of nanoseconds accuracy
- ▶ 5x 1G and 2x 25/10/1G network ports standard
- ▶ Improved oscillator with 4 us/day holdover (previously 25)
- ▶ Standard datacenter cooling requirements for easy install
- ▶ Can act as Grandmaster and/or boundary clock for NTP and PTP
- ▶ Time Intelligence Platform gathers statistics from clients, detects problems
- ▶ Auto-discovers your time network topology and displays it for single-pane-of-glass enterprise management
- ▶ Remote monitoring/configuration
- ▶ Multiple time sources for redundancy/security
- ▶ Detect/self-heal from network failure and GPS spoof attack
- ▶ GNSS jamming detection and recovery, Skymap visualization
- ▶ Scalable operation, including support for remote servers outside the local network and high performance implementation of both PTP and NTP
- ▶ Advanced time network administration via web interface

Get an accurate view of your GPS signal coverage with TimeKeeper's Skymap.

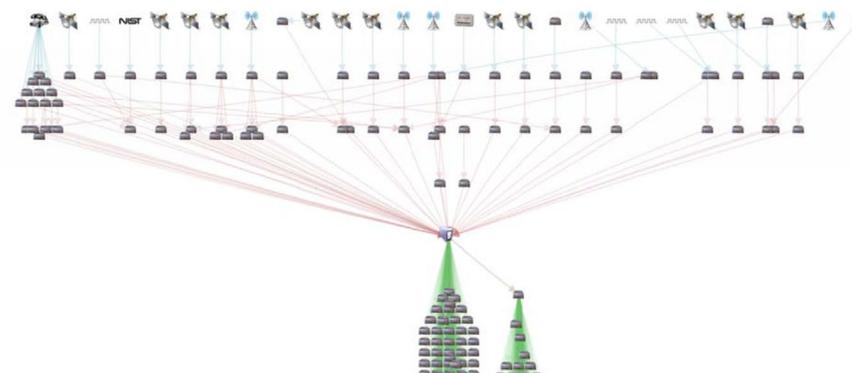


## Specifications

<b>Chassis</b>	1U rack-mountable, dual (redundant) power supplies, redundant (RAID) storage
<b>Networking</b>	5x 1G Ethernet RJ45 2x 25G Ethernet SFP28 Additional networking* Infiniband*
<b>Non-Packet Time Signals</b>	PPS output/10MHz output via SMA connector
<b>Time Source</b>	GPS, GLONASS, Beidou, Galileo
<b>Oscillator</b>	< 4 $\mu$ s/24hr holdover < 0.6 $\mu$ s/24hr holdover*
<b>Management</b>	TimeKeeper Time Intelligence Platform for configuration of GrandMaster, monitoring, clients plus real-time performance data and network visualization
<b>Authentication</b>	RADIUS, TACACS+, local passwords
<b>Fault Detection</b>	TimeKeeper Multi-Source self-check, additional GPS sources and patent pending threat detection
<b>Audit Trace</b>	Full logging and alerting of sources and of any TimeKeeper Clients
<b>Protocol Support</b>	PTP, NTP, PTP telecom profile, PTP hybrid mode, TIME (RFC 868)

\* optional—please call

TimeKeeper's Time map capability automatically visualizes your timing network.





## How to Purchase

TimeKeeper GrandMaster Clocks (TK-GM, TK-GM-RB), TimeKeeper Server Software, and TimeKeeper Client Software are all available from FSMLabs and FSMLabs resellers.

For purchase information or for a live demonstration of TimeKeeper please contact FSMLabs at [sales@fsmlabs.com](mailto:sales@fsmlabs.com)



FSMLabs, Inc  
11701 Bee Caves Road  
Suite 200  
Austin, TX 78738

[sales@fsmlabs.com](mailto:sales@fsmlabs.com)  
[+1 512 263 5530](tel:+15122635530)  
[www.fsmlabs.com](http://www.fsmlabs.com)

© 2018 FSMLabs, Inc.  
TimeKeeper and FSMLabs are registered trademarks of Finite State Machine Labs Inc.