

VelaSync™

HIGH-SPEED TIME SERVER



Quick Reference Guide

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Introduction

VelaSync™ High-Speed Time Server with TimeKeeper™ inside is an enterprise-class time serving appliance designed for high-frequency trading and other network applications with low-latency requirements.

VelaSync's customized configuration, comprising state-of-the-art network synchronization software, precision GPS timing technology, and reliable server hardware allows it to provide high-performance time management over multiple Ethernet interfaces at speeds of up to 40 Gb.

This Quick Reference Guide is a supplement to the VelaSync User's Manual that is available via the Spectracom.com Support page. The goal of this Guide is to familiarize yourself with VelaSync's interfaces and general user features, and to help you access the time server configuration parameters through the web browser user interface.

Specifications

- ▶ Intel® Xeon® E5 Series quad-core processor, 8 GB RAM min.
- ▶ 2x Western Digital® Re 500 GB Enterprise-Class Hard Drives, RAID configuration
- ▶ 2x hot-swap power supplies, 100-240 V_{AC}, 50-60 Hz, 500 W each, with IEC60320 C14 inlet coupler
- ▶ Spectratime OCXO or Rubidium oscillator with GPS receiver
- ▶ 3x 1GbE network ports
- ▶ 2x 10 GbE (optionally 4x) network ports, or 2x 10 GbE plus optionally 2x 40 GbE
- ▶ All network ports offer hardware time stamping.
- ▶ I/O connectors: See Section "Rear Panel" on page 3.

Note: Specifications are subject to change without notice.

Environment

- ▶ Operation:..... 10°C to 35°C, RH: 8 to 90% (@ 35°C)
- ▶ Storage: -40°C to +50°C , RH: 5 to 95% (@ 70°C)

Size, Weight & Power

- ▶ Dimensions:(WxHxD) 17 x 1.7 x 25.6 in. (432 x 43 x 650 mm)
- ▶ Weight:.....23.5 lbs. (10.7 kg)
- ▶ Max. power draw (@ 20°C, 2 power supplies running, 2 hard disks installed)
 - ▶ 100 W typical; 120 W startup.

Safety Precautions



WARNING

Before connecting the unit to mains voltage, see manufacturer's safety warnings under: http://www.supermicro.com/about/policies/safety_information.cfm.

Electrical hazard. No user serviceable parts inside. Do NOT open panel before unplugging BOTH power supplies first (the POWER button will not de-energize the system!)



CAUTION

Do not use power supplies other than the model installed in your VelaSync, and do not mix power supplies with different power ratings.

In the unlikely event of a power supply failure, a replacement unit can be procured directly from Spectracom (part no. PS09R-070J-SL01).

Front Panel



NOTE

A more comprehensive description of the front panel elements is available in the VelaSync User's Manual: <http://manuals.spectracom.com/VS/Content/VS/Topics/INTRO/FroPa.htm>.

Control Buttons

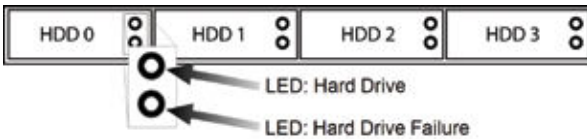
- ▶ **UID:** Unit identifier button – press button (or activate via IPMI) to turn blue LED in front and back of unit on/off, so as to identify the unit
- ▶ **Reset:** Reboot the system
- ▶ **Power:** Apply/remove power from the power supply of the server.
(**Note:** Standby power continues to be supplied to the system)

LEDs

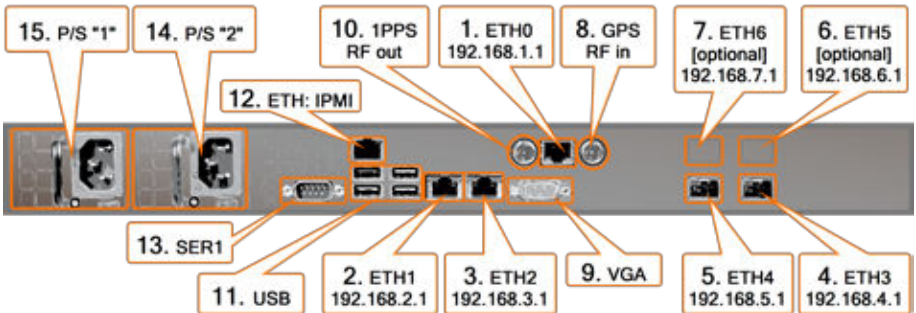


- ▶ **UID:** Blue Unit Identifier LED (also on unit rear panel)
- ▶ **Info** (red): Blinking fast: Fan fail; slow blinking: Power fail; solid red: CPU overheat
- ▶ **NIC2, 1:** Activity on GLAN 1,2 when flashing
- ▶ **HDD:** IDE channel activity when flashing
- ▶ **Power:** Power is applied to power supplies

Hard Disks



Rear Panel



- 1./2./3..... 1GbE ports (RJ-45)
- 4./5..... 10 GbE ports (SFP+)
- 6./7..... optional 10 GbE, or 40 GbE ports (SFP+, or QSFP+)
- 8..... GPS antenna connector
- 9..... VGA
- 10..... PPS Out
- 11..... USB (4x)
- 12..... IPMI
- 13..... Serial
- 14..... power supply
- 15..... power supply

TimeKeeper™

FSMLabs' TimeKeeper software is pre-installed on any VelaSync™ time server. TimeKeeper's browser-based UI allows you to configure and monitor your time distribution network. To find out more, see:

- ▶ How to access TimeKeeper: Chapter "Connecting & Configuring" below
- ▶ Monitoring functionality: Chapter "Operation/TimeKeeper" below

The screenshot displays the TimeKeeper configuration web interface. At the top, there are navigation tabs: Status, Configuration, Timing Quality, Time Map, Logs, and Support. Below these are sub-tabs for TimeKeeper configuration, Networking, Service & System Management, Update, and Licenses.

Application settings

- Serve NTP:
- Serve NTP on interface: All
- SNMP trap host: [text input]
- SNMP trap OID: [text input]
- Avoid network interfaces: [text input]
- Address for email notifications: [text input]
- Set time on startup:
- Enable timing map:
- Enable TK GPS device details:
- Enable sourcecheck:
- Bind TimeKeeper to CPU: -1
- Enable management query:
- Enable management response:
- Management query interval: 15
- Syncerror threshold throttle: 3
- Enable web management:
- Web management port: 80
- Web management IP address: [text input]
- Enable Solarflare UUID filtering:
- serve time (UTC offset): [text input]
- Days of TimeKeeper logs retained: 7

Verbose settings

- Enable verbose NMEA:
- Enable verbose tcpdump:
- Enable verbose PPS:
- Enable verbose server:
- Enable verbose management:
- Enable verbose PTP:
- Enable verbose timestamps:

Sources - PTP servers

Timing Sources - Click and drag to change priority

- 0 - PRIMARY) PPSDEV /dev/ttyUSB0**
- PPSDEV: /dev/ttyUSB0
- TimeKeeper GPS device:
- Sync error threshold: [text input]
- Major time: Choose one
- Low quality source: *
- Cable delay: [text input]
- Alternate PPS Source: /dev/ttyUSB0

Add a new source

NTP PTP PPS or Bus device

- NTP server: [text input]
- NTP sync rate: [text input]
- Sync error threshold: [text input]
- Major time: Choose one
- Cable delay: [text input]
- Low quality source: *
- Periodically re-resolve DNS name: *

Installation



NOTE

For detailed installation instructions, see the Chapter “Installation and Setup” in the VelaSync User’s Manual: <http://manuals.spectracom.com/VS/Content/VS/Topics/Admin/IntroCHAPTER2.htm>.

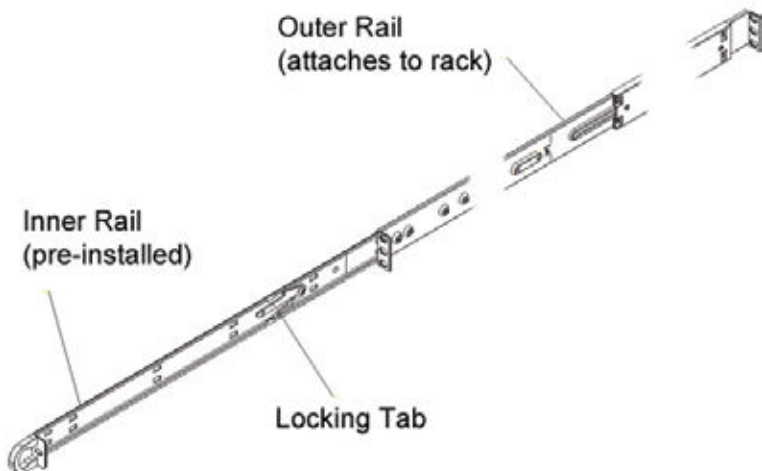
The following is a brief summary for experienced installation personnel:

Server Location Selection

- ▶ Dedicated room with restricted access
- ▶ Clean, dust-free, ambient temperature not to exceed 35°C [95°F]
- ▶ Virtually free of EMC noise
- ▶ Mechanically stable
- ▶ Electrically grounded rack with physical clearance for air flow and servicing: approx. 65 cm [25"] in front of rack, 75 cm [30"] in the back of rack
- ▶ Use of a UPS is recommended

Mechanical Installation

Each of the two rack rail assemblies comprise an **inner chassis rail** (pre-installed to the server chassis), and an **outer rail** that needs to be mounted to the rack:



1. Measure the distance from the front rail to the rear rail of the rack. Attach a **short bracket** to the front side of each of the outer rails, and a **long bracket** to the rear side of each outer rail.
2. Adjust both the short, and the long brackets to the distance measured earlier so that the rails fit snugly into the rack. Secure the short bracket to the front side of the outer rail with **two screws**, and the long bracket to the rear side of the outer rail with **three screws**. Take note of the **locking tabs**, which prevent the server from sliding out too far out of the rack.
3. Line up the rear of the inner rails at the chassis with the front of the outer rails at the rack. Slide the server chassis into the rack, keeping the pressure even on both sides. Depress the locking tabs, if needed (they will click upon proper engagement).

TELCO rack installation: Use two L-shaped brackets on either side of the chassis. Determine a balanced front-to-back position of the chassis. Remove bezel from server, if installed. Attach the two front brackets to each side of the chassis, then the two rear brackets, leaving enough space to accommodate the width of the telco rack. Slide the chassis into the rack, and tighten the brackets to the rack.

Connecting & Configuring

1. Connect a GPS antenna system to the GPS connector (see page 3, rear panel illustration, item number 8), using the supplied antenna cable, and an LMR-400 equivalent cable with surge suppressor and active GPS L1 antenna, such as Spectracom model 8230. Note the GPS receiver connection provides 5 V_{DC} power for the antenna.
2. Connect a PC with a configured LAN port via Ethernet cable to the VelaSync server e.g., using ETH0. Start a web browser, and go to 192.168.1.1 (= IP address for ETH0, see illustration on page 3) in order to log into the TimeKeeper™ software via its web user interface (“**Web UI**”). The default username is “**admin**”, and the password is “**fsmlabs**”.



CAUTION

For security reasons, please change the default **password** immediately by navigating to the **Configuration** menu > **Service & System Management: Set admin password**.

3. If this is the first time you are logging in after installing a software upgrade, it is recommended that you force a full page reload (**Ctrl-Shift-R** on many browsers). This will make sure your browser loads the latest web interface from the time server, and provides all of the latest features.

4. In the TimeKeeper Web UI, go to **Configuration > Networking** to configure the network ports. After entering your changes, click on **Save network changes** in the upper right-hand corner. Then click on **Restart TimeKeeper & Network** in the same location to apply the changes.

The changes will take a moment to apply after which you can reconnect to the newly configured address.

Please see below for details on enabling additional access methods.

Verifying Configuration

After logging into the unit and connecting a GPS antenna, verify the synchronization status in TimeKeeper under the **Status** tab. Once synchronization is established, the server will answer NTP queries and provide any PTP service on the default domain (domain 0) on all network interfaces.

Note that initial GPS startup can take up to 15 minutes.
No further server configuration should be necessary.

Default Network Configuration

The unit is shipped with static IP addresses: ETH0 = for 192.168.1.1, ETH1 = 192.168.2.1, etc. This also applies to the optional 10/40 Gbps SFP+ ports: ETH5 (192.168.6.1) and ETH6 (192.168.7.1).

Access via RS232, keyboard/monitor, or SSH needs to be enabled through TimeKeeper™ – see User Manual for details.



NOTE

TimeKeeper does not support having multiple network interfaces on the same subnet or multipath routing.

About IPMI

IPMI is a protocol that allows for out-of-band management of computer systems, even when they are turned off. IPMI is active whenever the server is powered.

VelaSync has a dedicated IPMI Ethernet interface (see page 3: rear panel illustration, item number 12.) By default, the IPMI interface uses DHCP to obtain an IP address.

The IP address of the IPMI interface is listed under the TimeKeeper™ **Configuration > Networking** tab: **Network Interfaces**. A static IP address can also be set if DHCP is not desired.

Operation



NOTE

For more detailed information pertaining to TimeKeeper operation, please consult the VelaSync User's Manual, Chapters "TimeKeeper" and "How to.../Frequently Performed Tasks": <http://manuals.spectracom.com/VS/Content/VS/Topics/INTRO/Intro.htm>.

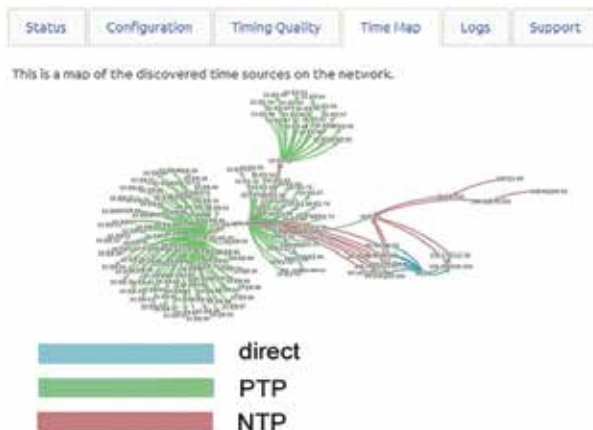
Keep the server panels and door closed at all times, to maintain proper cooling air flow.

Maintenance

Check the front bezel filter for contamination regularly. Other than that, if operated in accordance with its environmental specifications, VelaSync will be virtually maintenance-free.

TimeKeeper™

Under the **Time Map** tab, the time sources on a network discovered by TimeKeeper are shown in a graphical presentation. This visual aid assists in understanding the topography of a timing network. The directions and colors of the arrows provide additional information on synchronization and reference time sources.



Quantifiable information on signal accuracy, frequency, and delay is displayed under the tab **Timing Quality**: Choose between available sources and clients (1), time source IP addresses (2), type of data (accuracy, frequency, delay—3), and time window (4), to display a line graph showing raw and average data:



Powering OFF VelaSync

To power off VelaSync, in TimeKeeper navigate to the **Service & System Management** tab, and then, under **Manage System**, select **Shutdown system** to gracefully shutdown TimeKeeper, and power down VelaSync.

Power Supply Replacement

For redundancy purposes, VelaSync is equipped with two hot-swap power supply modules. Should either of the modules fail, the other will take the full load, and supply power without interruption to the server. The LED on the control panel will blink slowly until the defective module has been replaced.



NOTE

For detailed information about power supplies, see <http://www.superni-cro.com.tw/manuals/superserver/1U/MNL-1328.pdf>, Chapter 2 on page 2-1.

The following is a brief summary for experienced installation personnel:

In the event of a power supply failure: In order to replace a power supply, determine which of the two units is defective by checking both LEDs at the back of the server. Unplug the defective power supply, push the release tab to the side, and pull the module out. Replace it with another identical-model power supply.



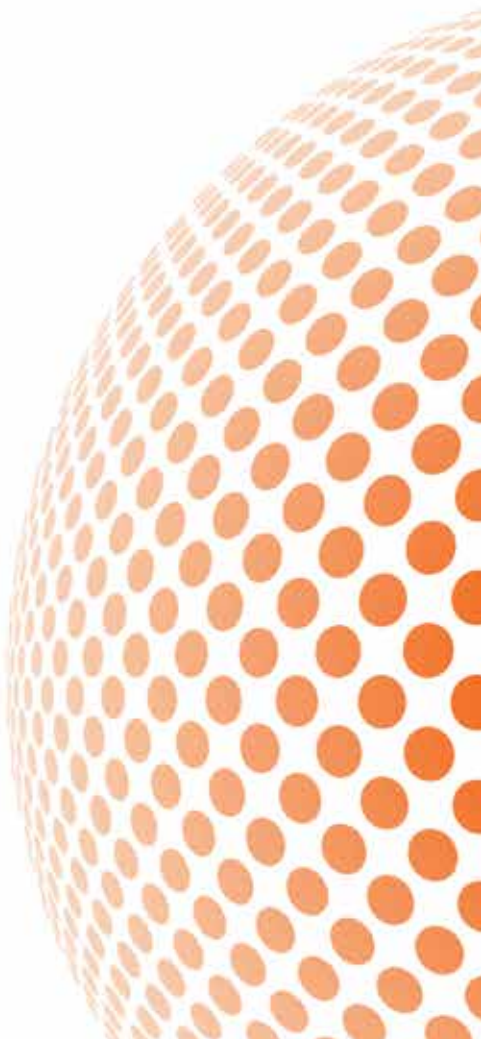
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