

VersaSync

Getting Started Guide



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About this Guide

This Getting Started Guide is a supplement to the main user manual for VersaSync. The latest version of the main user manual can be found online under manuals.orolia.com.

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Product Overview

This section is designed to help you become familiar with the structure, features, and functions of the VersaSync.

1.1 Interfaces Overview

All of VersaSync's interfaces are integrated into the unit's connectors, which are located on the front panel:

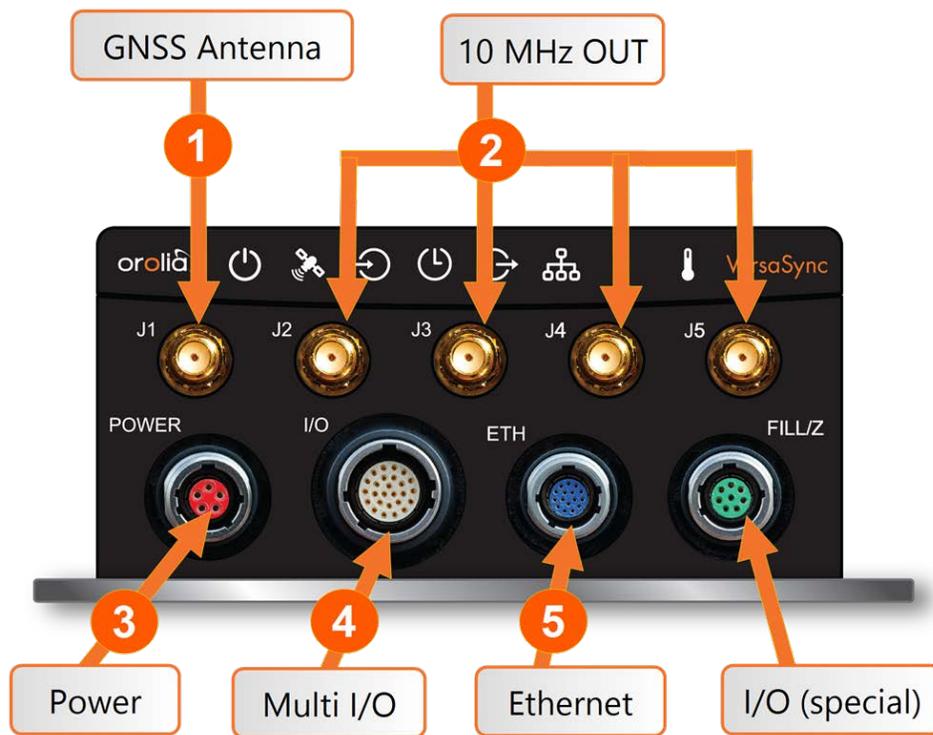


Figure 1-1: VersaSync front panel connectors

Note: VersaSync is highly configurable and the connections can be adjusted many different ways. Your interface configuration may vary based on options you selected during the ordering process.

The following interfaces are provided:

1.1.1 Input Timing Interfaces

Table 1-1: VersaSync inputs (default setup)

INPUT SIGNAL	Total available	DCLS		RS-232	RS-485	ETH	Connector No. (see Fig. above)
		TTL	10V				
1PPS	(1)	1					4
ASCII/HaveQuick/IRIG B	(1)				1		4
ASCII/NMEA	(1)			1			4
GNSS (GPS) antenna connection	(1)	SMA					1
Network Interface (10/100/1000bT): NTP (Stratum 2), PTP	(2)					1	5

All **Multi I/O** interfaces (connector no. 4) are software-configurable, see "[Assigning I/O Pins](#)" on page 21.

1.1.2 Output Timing Interfaces

Table 1-2: VersaSync outputs (default setup)

OUTPUT SIGNAL	Total available	DCLS		RS-232	RS-485	ETH	Connector No. (see Fig. above)
		TTL	10V				
10 MHz	(4)	SMA					2
1PPS	(2)	1	1				4
ASCII/HaveQuick	(1)				1		4
ASCII/NMEA	(1)			1			4
NTP server, PTP v2 master	(1)					1	5

All **Multi I/O** interfaces (connector no. 4) are software-configurable, see "[Assigning I/O Pins](#)" on page 21.

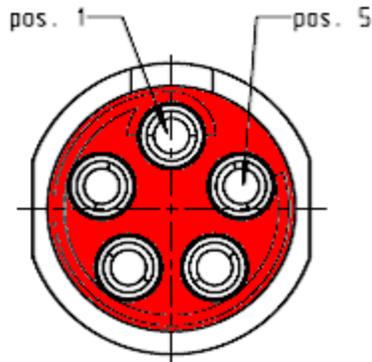
1.1.3 Other Interfaces

- » USB serial equivalent: CLI interface (Connector 4)

1.2 Connectors and their Pinouts

All of VersaSync's connectors are provided at the front panel of the unit, below the Status LEDs.

1.2.1 Power Connector



Note: View in mating direction from front.

Table 1-3: Power connector pinout

Pin	Signal
1	V _{Main} (10 to 32 V)
2	-not used-
3	V _{Standby} (10 to 32 V)
4	GND (to Standby)
5	GND (to Main)

This product is designed to handle a **maximum voltage of up to 32 V_{DC}**. Power supplies with higher voltage or transient/ cranking power will require a power conditioner or surge blocker.



Caution: Reversed polarity can blow an internal fuse that protects the product from damage. Use care when building power cables.

Test any new cables to safely power the unit before connecting your VersaSync to any other inputs or outputs (such as a GNSS antenna), and before grounding your unit to a vehicle.

1.2.2 Input/Output Connector

VersaSync has a 26-pin input/output connector that offers 8 software-configurable CHANNELS, plus one fixed DCLS channel, and a USB interface. To learn more about types of interfaces and signals, and how to configure them, see "[Assigning I/O Pins](#)" on page 21.

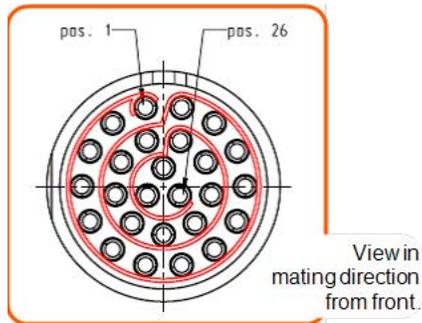
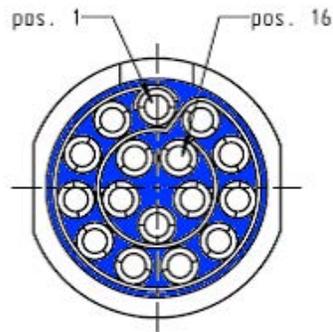


Table 1-4: Default I/O connector pinout

Pin	Channel	Signal	Pin	Channel	Signal
1	0	1PPS output (5V)	15	7	Have Quick output (RS-485 signal +)
2		GND	16		GND
3	1	Have Quick input (RS-485 signal +)	17	8	Have Quick output (RS-485 signal -)
4		GND	18		GND
5	2	Have Quick input (RS-485 signal -)	19	9 (USB dedicated)	GND
6		GND	20		GND
7	3	1PPS output (10 V)	21		Not connected
8		GND	22		GND
9	4	ASCII output (RS-232)	23		USB D-
10		GND	24		GND
11	5	1PPS input	25		USB D+
12		GND	26		GND
13	6	ASCII input (RS-232)			
14		GND			

1.2.3 Ethernet Connector



Note: View in mating direction from front.

The Ethernet connector provides two 1GbE network connections, using 8 wires (pinout below).

Table 1-5: Ethernet connector pinout

Pin	Signal	Pin	Signal
1	Ethernet_1 A+	9	Ethernet_2 A+
2	Ethernet_1 A-	10	Ethernet_2 A-
3	Ethernet_1 B+	11	Ethernet_2 B+
4	Ethernet_1 B-	12	Ethernet_2 B-
5	Ethernet_1 C+	13	Ethernet_2 C+
6	Ethernet_1 C-	14	Ethernet_2 C-
7	Ethernet_1 D+	15	Ethernet_2 D+
8	Ethernet_1 D-	16	Ethernet_2 D-

It is also possible to wire your connector to 100MbE, using only 4 wires. Contact Tech Support for more information.

1.2.4 Optional I/O Connector

The Optional I/O connector ("SAASM" or "FILL/Z") is used in conjunction with the Option Board that is available for VersaSync. If the unit is not equipped with an Option Board, this connector is not used.

1.2.5 Coaxial Connectors

VersaSync offers five (5) coaxial connectors, three (3) of which can be configured at the factory to accommodate requirements for e.g., additional 10 MHz outputs. The minimum configuration includes the **GNSS antenna** and a **10 MHz sinewave** output.

Unless otherwise ordered at the factory, all coaxial connectors (aside from the GNSS connection) produce a 10MHz output that can be all disabled through the Web UI..

All coaxial connectors are **standard SMA connectors**. Avoid tightening past the maximum torque.

ETHERNET connector wiring:

- » 1 through 8: A Ethernet Connect, 4 pairs, 1000bT (in the software, eth0)
- » 9 through 16: B Ethernet Connect, 4 pairs, 1000bT (in the software, eth1)

POWER connector pinout

- » 1: V_{Main} , 10 to 32 V_{DC}
- » 2: -not used-
- » 3: $V_{Standby}$, 10 to 32 V_{DC} (Standby Power)
- » 4: Ground return, standby power
- » 5: Ground return, main power

1.3 Included Cables

The VersaSync Evaluation Kit contains the following cables (antenna cable not shown):

Power Cable

P1
PLUG, ODU AMC SERIES, B KEY, 5 PIN, M, SOLDER, 22AWG, 10A, 450V

P2
P3
PLUG, POWER BARREL 2.1mm, MALE, 24VDC, 4A

VIEWED IN DIRECTION "A"
(TERMINATION SIDE)

WIRE DATA										
CUT					ROUTE FROM			ROUTE TO		
WIRE ITEM No.	PAIR	REFERENCE COLOR	AWG	LGTH	LOC.	TERMINAL ITEM No.	CONNECTOR ITEM No.	LOC.	TERMINAL ITEM No.	CONNECTOR ITEM No.
10	1	WHITE	24	12 IN	P1-1	-	8	P2-PIN	-	9
10	1	BLACK	24	12 IN	P1-5	-	8	P2-SHELL	-	9
10	2	RED	24	12 IN	P1-3	-	8	P3-PIN	-	9
10	2	GREEN	24	12 IN	P1-4	-	8	P3-SHELL	-	9
10	-	DRAIN	24	12 IN	P1-SHELL	-	8	-	-	-
-	-	-	-	-	P1-2	-	-	-	-	-

I/O Cable

ODU AMC SERIES, A KEY, 26 Pin M, SOLDER, 26 AWG, 5A, 300 V

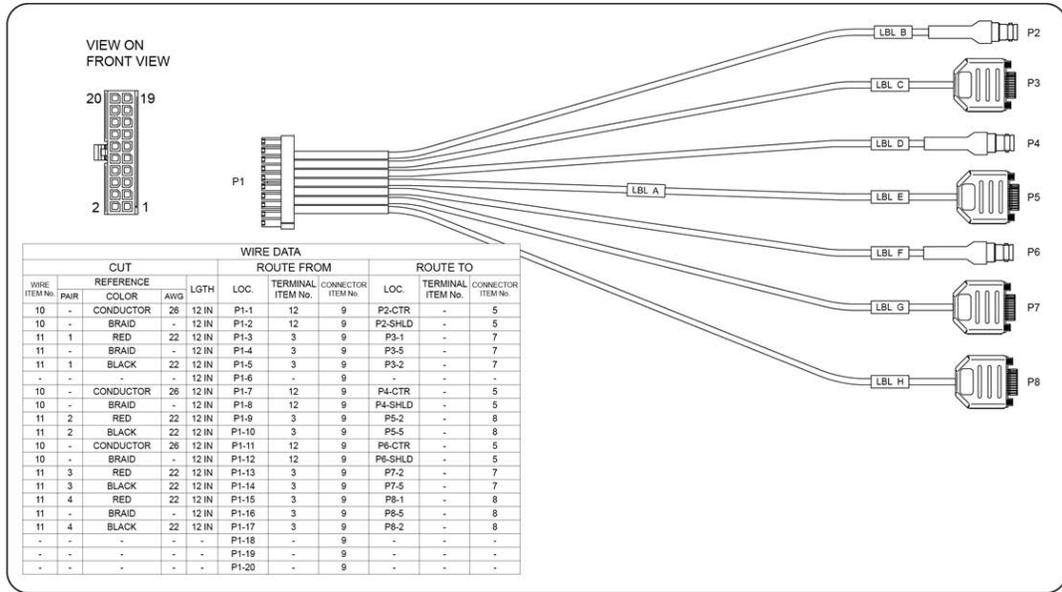
CABLE USB TYPE A

VIEW ON TERMINATION SIDE

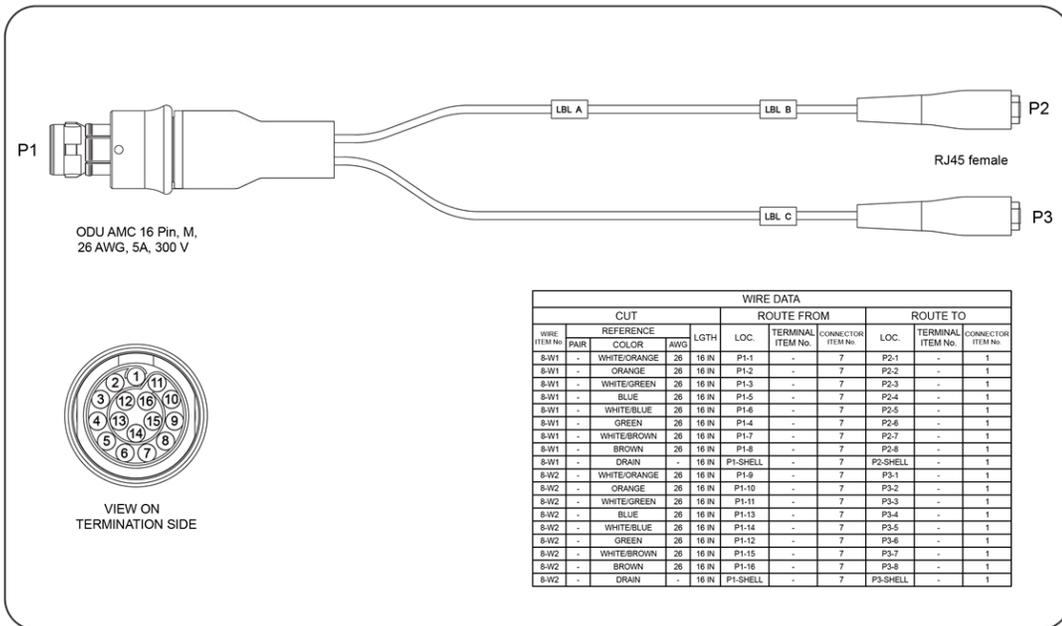
VIEW ON FRONT VIEW

WIRE DATA										
CUT					ROUTE FROM			ROUTE TO		
WIRE ITEM No.	PAIR	REFERENCE COLOR	AWG	LGTH	LOC.	TERMINAL ITEM No.	CONNECTOR ITEM No.	LOC.	TERMINAL ITEM No.	CONNECTOR ITEM No.
11	1	BLACKRED	28	12 IN	P1-1	-	8	P2-1	10	9
11	1	REDBLACK	28	12 IN	P1-2	-	8	P2-2	10	9
11	2	BLACKWHITE	28	12 IN	P1-3	-	8	P2-3	10	9
11	2	WHITEBLACK	28	12 IN	P1-4	-	8	P2-4	10	9
11	3	BLACKGREEN	28	12 IN	P1-5	-	8	P2-5	10	9
11	3	GREENBLACK	28	12 IN	P1-6	-	8	P2-6	10	9
11	4	BLACKBLUE	28	12 IN	P1-7	-	8	P2-7	10	9
11	4	BLUEBLACK	28	12 IN	P1-8	-	8	P2-8	10	9
11	5	BLACKYELLOW	28	12 IN	P1-9	-	8	P2-9	10	9
11	5	YELLOWBLACK	28	12 IN	P1-10	-	8	P2-10	10	9
11	6	BROWNBLACK	28	12 IN	P1-11	-	8	P2-11	10	9
11	6	BLACKBROWN	28	12 IN	P1-12	-	8	P2-12	10	9
11	7	BLACKORANGE	28	12 IN	P1-13	-	8	P2-13	10	9
11	7	ORANGEBLACK	28	12 IN	P1-14	-	8	P2-14	10	9
11	8	REDWHITE	28	12 IN	P1-15	-	8	P2-15	10	9
11	8	WHITERED	28	12 IN	P1-16	-	8	P2-16	10	9
11	9	REDGREEN	28	12 IN	P1-17	-	8	P2-17	10	9
11	9	GREENRED	28	12 IN	P1-18	-	8	P2-18	10	9
11	10	REDBLUE	28	12 IN	P1-19	-	8	P2-19	10	9
11	10	BLUERED	28	12 IN	P1-20	-	8	P2-20	10	9
1	-	RED	-	-	P1-21	-	8	P3-1	-	1
-	-	-	-	-	P1-22	-	8	-	-	-
1	-	WHITE	28	3.5 IN	P1-23	-	8	P3-2	-	1
1	-	BLACK	28	3.5 IN	P1-24	-	8	P3-4	-	1
1	-	GREEN	28	3.5 IN	P1-25	-	8	P3-3	-	1
-	-	-	-	-	P1-26	-	8	-	-	-
11	-	SHIELD	-	12 IN	P1-SHELL	-	8	-	-	-
1	-	DRAIN	-	3.5 IN	P1-SHELL	-	8	P3-SHELL	-	1

I/O Breakout Cable



Ethernet Data Cable



1.4 Status LEDs

VersaSync's front panel status LEDs provide a real-time status overview: Eight (8) LEDs indicate the unit's current operating state:



The LEDs can be disabled, see "[Blackout Mode](#)" on page 11.

1.4.1 Blinking Intervals

The status LEDs can communicate five different operating states:

- » "OFF"
- » "ON"
- » "FAST": blinking interval @ 8Hz
- » "SLOW": blinking interval @ 2Hz
- » "HEARTBEAT": sinus-shaped interval @ 1Hz

1.4.2 LED Lighting Patterns

The table below indicates LED status light patterns for common VersaSync operating statuses.

Table 1-6: Common light patterns

								
Start-up	HEARTB.	OFF	OFF	OFF	OFF	OFF	OFF	OFF
Acquiring fix	ON	FAST	FAST	FAST	FAST	FAST	HEARTB.	FAST
Software upgrade	FAST	OFF	OFF	FAST	OFF	FAST	HEARTB.	OFF

1.4.3 Legend, individual LEDs

Table 1-7: Legend for Status LEDs

Icon	Light	Meaning
	OFF	No power
	HEARTBEAT	Booting
	ON	Powered
	OFF	No GNSS reception (0 satellites)
	HEARTBEAT	GNSS acquisition in process (≥ 1 satellite(s), or 1PPS OK, or Time OK)
	SLOW	Jamming detected
	FAST	Antenna short circuit
	ON	GNSS is available as reference (1PPS and Time OK)
	OFF	Inputs not detected/all inputs are disabled
	FAST	1 or more input is missing, or invalid timing on 1 or more input detected
	ON	Inputs are enabled
	OFF	Unit is in Holdover (valid)
	ON	System Clock OK (valid)
	FAST	Invalid Time (Holdover period exceeded, or oscillator damaged)
	OFF	No output signal(s) detected/all outputs are disabled
	FAST	Malfunction detected (short circuit, or overload)
	ON	Outputs are enabled

Icon	Light	Meaning
	OFF	No network detected
	FAST	Network malfunction detected (e.g., no auto-negotiation)
	ON	Network OK, configuration OK
	OFF	Unit OK
	FAST	Unit requires attention; check other status LEDs, see Web UI
	HEARTBEAT	See table " LED Lighting Patterns " on page 9
	OFF	Temperature OK
	FAST	High temperature detected

1.4.3.1 LED Patterns during Boot Sequence

For the first five seconds after power-up all LEDs will be OFF. Then the Power LED will be blinking before it will be lit permanently. If you have configured your unit to operate in Blackout Mode, this will take effect once the blinking cycle ends.

1.4.4 Blackout Mode

All LEDs can be turned off via the Web UI.

The LED brightness level can be set from **63** (as bright as possible) to **0** (not visible).

To disable all LED activity via the WebUI:

- » Navigate to **MANAGEMENT > OTHER: LED Configuration**, and set the Brightness level to "0".

1.5 The VersaSync Web UI

VersaSync has an integrated web user interface (referred to as "Web UI" throughout this documentation) that can be accessed from a computer over a network connection, using a standard web browser. The Web UI is the most complete way to configure the unit, and for status monitoring during everyday operation.



Note: If you prefer, an integrated Command-Line Interpreter interface (CLI) allows the use of a subset of commands.

1.5.1 The Web UI HOME Screen

The **HOME** screen of the VersaSync web user interface ("Web UI") provides comprehensive status information at a glance, including:

- » vital **system** information
- » current status of the **references**
- » key **performance**/accuracy data
- » major **log events**.

The **HOME** screen can be accessed from anywhere in the Web UI, using the HOME button in the **Primary Navigation Bar**:



The **Primary Navigation Bar** provides access to all menus:

- » **HOME**: Return to the HOME screen (see above)
- » **INTERFACES**: Access the configuration pages for ...
 - » ... references (e.g., GNSS, NTP)
 - » ... outputs (e.g. 10 MHz, PPS, NTP) and
 - » ... installed input/output option cards.
- » **MANAGEMENT**: Access the NETWORK setup screens, and OTHER setup screens e.g., to configure Reference Priorities, System Time, and the Oscillator.
- » **TOOLS**: Opens a drop-down menu for access to the system maintenance screens and system logs.
- » **HELP**: Provides Orolia Service Contact Information and high-level system configurations you may be required to furnish when contacting Orolia Service.

Quick Start

During the procedure described below, you will connect the **Power** cable, the **Multi I/O** cable, and the **Ethernet** cable to the unit. These cables are included in the Evaluation kit. If you plan to use your own cables, some of these instructions may not apply.

The step-by-step instructions below outline the VersaSync installation and configuration process:

1. **Install VersaSync** in the designated vehicle:
 - » Choose a mounting location within reach of your antenna and networking cables
 - » Optionally, ground the unit by connecting the DC negative terminals to the chassis of the unit, and to the vehicle metallic structure.
 - » The mounting plate should be in direct contact with the unit base plate, and the mounting surface is even and heat conductive.
2. **Connect the power supply**. The unit will power up, and the ON/OFF status LED will pulsate.

Requirement	Action	Evaluation kit cable
Power up	Connect 12 V _{DC} to the power connector.	Attach a cable and apply 12 V _{DC} to the plug labeled "Main" (CA08R-CRPB-0002)



Caution: If your unit does not power up, there may be a problem with your cables. If this is your first installation using your cables, check the polarity of the wires and confirm that the unit will power up normally before proceeding with these steps or making any other connections.

3. **Install the GNSS antenna(s)**. Follow your antenna manufacturer's instructions.
4. **Wire the antenna cables and interface cables**. (Most customers will require the Multi I/O and Ethernet cables for these connections.)
 - » **USB:** Connect the **Multi I/O** connector to the VersaSync unit. If you are using the Evaluation Kit, connect the Multi I/O USB output to a PC. Install a **terminal emulator** program on the PC (e.g., TeraTerm® or PuTTY®).
 - » **Ethernet:** Connect the **Ethernet** cable to the ETH port of the unit. If you are using the Evaluation Kit, connect at least one of the two I/O cable Ethernet

ports (ETH0 or ETH1) to a network switch/hub, or to the PC mentioned above (using a standard Ethernet patch cable, or a crossover cable).

Requirement	Action	Evaluation kit cable
USB connection	Connect USB to the Multi I/O connector.	Connect the USB connector to a PC with a terminal emulator program (CA08R-CRUB-0002)
Network connection	Connect at least one of the two Ethernet connectors to a network.	Connect the RJ45 jack labeled ETH0 or ETH1 to a network hub/switch or directly to a PC (CA08R-CRET-0002)

For pinout tables, see "[Connectors and their Pinouts](#)" on page 3.

5. **Establish a network connection** so as to allow access to the web user interface ("Web UI"). See "[Network Setup](#)" below for information on the USB driver installation and network address configuration.



Note: On a DHCP network, you can also use Zeroconf to access the Web UI (see "[Zero Configuration Setup](#)" on page 19).

6. Using the Web UI, **configure** the following:
 - » Software-configurable I/O pins, see "[Assigning I/O Pins](#)" on page 21.
 - » Other VersaSync INTERFACES settings and MANAGEMENT settings e.g., network settings, reference priorities (see main product user manual).

2.1 Network Setup

After making the connections outlined in the Quick Start list, the following information will help you to establish a network connection.

VersaSync has a **Command Line Interpreter** ("CLI"). The CLI is available either through the USB serial or Ethernet direct VersaSync-to-PC connections.

The **web user interface** ("Web UI") is used to configure and monitor the unit. The Web UI is available through one of the Ethernet ports via a network connection.

Default settings:

VersaSync network settings default to static IP addresses. The Ethernet ports come pre-configured with IP addresses as follows:

Eth0 - 192.168.1.1

Eth1 - 192.168.1.2

Default subnet mask: 255.255.255.0

Note: VersaSync supports **zeroconf**: If you have a DHCP-enabled network, you can use zeroconf for initial setup. For more information, see "Zero Configuration Setup" on page 19. Otherwise follow the instructions below for conventional setup.

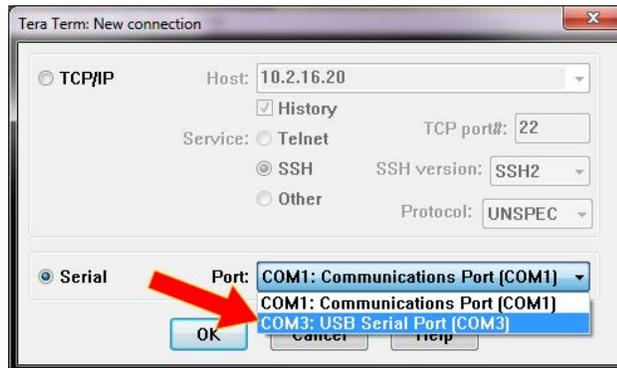
Network connection:

1. **USB Driver**

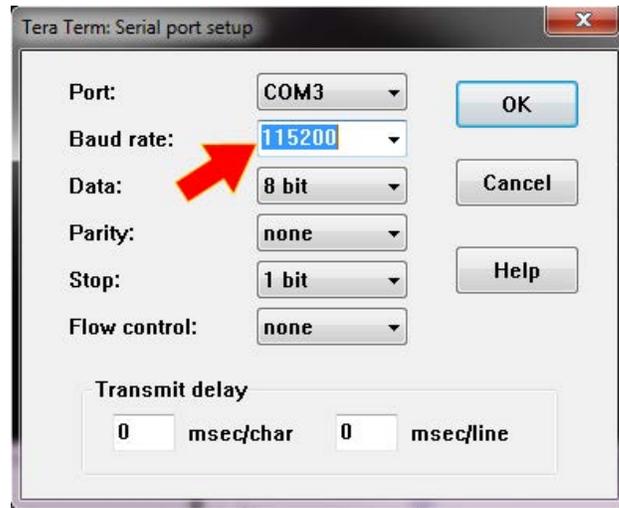
- » If you are using a USB connection through the multi I/O connector, driver installation may be necessary. On the PC connected to your unit, new hardware (the USB interface) will be detected. The correct driver should be installed automatically. If not, download the driver from www.ftdichip.com/Drivers/VCP.htm, and install it manually via the instructions for your operating system.

2. **Network Address**

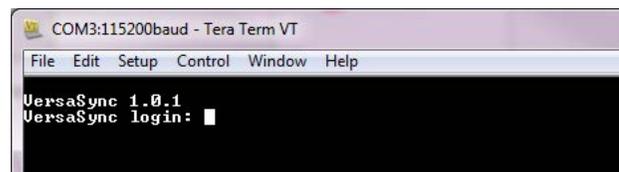
- a. Start the terminal emulator program on the PC. Select the COM port that is assigned to the USB interface:



Access the CLI via ssh or telnet: The required port configuration is 115200 8N1:



Press the **Return** key, and enter the login credentials:



Note: The default login credentials are:

User name = `spadmin`

Password = `admin123` (will not be displayed on the screen)



Note: For your reference, the command `helpcli` produces a list of available commands. Press the `space` key to display the next page, or the `b` key to display the previous page.



Note: Should it become necessary to leave the command help mode (indicated by a command line prompt `:"`), press `Q`, or `Ctrl C`.

- b. If you are on a DHCP-enabled network, you **can assign an IP address by enabling DHCP on your unit**. Use the `dhcp4set <x>` on command, (x being 0/1 for ETH0 and ETH1, respectively).

Retrieve the IP address assigned to VersaSync by typing the `net4` command. The command should return the network settings, including the IP address.

```

COM3:115200baud - Tera Term VT
File Edit Setup Control Window Help
VersaSync 1.0.1
VersaSync login: spadmin
Password:
Spectracore VersaSync Version 1.0.1
Hash 79d2ef5de72d
VersaSync:~$ net4
Hostname: VersaSync
Main IPv4 default gateway (eth0): 10.2.1.1
eth0
IP:10.2.100.167/16
DHCPv4(eth0)=Enabled
DC4=10.2.1.1
DNS1:10.1.1.26
DNS2:10.1.1.27
eth1 (Disabled)
00:0c:0c:0d:00:19
3.0.0.0.0
DHCPv4(eth1)=Enabled
DC4=0.0.0.0
VersaSync:~$
    
```

- c. If you are NOT on a DHCP-enabled network, your unit's **IP address is set to the default** for each Ethernet port (unless you have assigned a new static IP address). You can access the unit via the default address with a PC configured to the same subnet mask (255.255.255.0).
- d. You can **set a static IP address through the CLI** using the command: `ip4set <x>.<IP address>.<subnet mask>` Example: `ip4set 0 10.2.100.245 255.255.0.0`

If required, also set your gateway address: `gw4set <x> <gateway address>`.

Or, follow the steps below to set an IP address through the Web UI.

3. Log In to the Web UI

- a. On a PC connected to VersaSync via ETH0 or ETH1, start a web browser.
- b. Navigate to the IP address obtained or assigned in Step 2.
- c. Login to the VersaSync Web UI, using the same credentials as mentioned above.
- d. If so required, you can also change VersaSync's IP configuration (address, subnet, gateway, ...):
 - i. Navigate to **MANAGEMENT > Network Setup**.
 - ii. In the **Ports** panel on the right, click the GEAR button next to ETH0 or ETH1: The **Edit Ethernet Port Settings** panel will open.



- iii. If necessary, disable DHCP by unchecking **Enable DHCP**.
- iv. Click submit, and start a new Web UI session by entering the new IP address into your browser and logging in.
- e. You have now established a network connection with VersaSync. To continue with other configurations e.g., NTP settings, references, outputs, etc., see the full user manual: manuals.orolia.com.

2.2 Zero Configuration Setup

As an alternative to conventional network configuration, VersaSync can also be set up using the zero-configuration networking technology ("zeroconf").



Note: You can use Zeroconf on either Ethernet port if DHCP is enabled. Zeroconf must be used with a DHCP server.

When using zeroconf, a TCP/IP network will be created automatically, i.e. without the need for manual configuration: Once VersaSync's ETH connector is connected to a network, you can directly access the VersaSync Web UI, using a standard web browser, without any configuration.

Zeroconf can be used to connect to the unit through the Web UI:

- » when you need to identify the IP address assigned to your unit through DHCP (DHCP must be enabled through the Web UI or CLI)
- » in circumstances when your unit is not connected directly to a PC
- » when you wish to access the Web UI of your VersaSync without using the CLI commands or serial connection
- » anytime the IP address of a unit is not known

2.2.1 Using Zeroconf

Connect to the Web UI of your VersaSync unit in these steps:

1. Check the serial number label on the side of the unit, and write down the last 6 digits of the **MAC O** address: e.g., "0C 00 19". Note that you will use the same MAC address for either Ethernet port.
2. Connect the VersaSync to a router on your LAN via the ETH connector.
3. Connect the power supply to the VersaSync unit.
4. On a connected computer, open your web browser and in the URL field type the following:

`versasync-[xxxxxx].local/`

where the [xxxxxx] of the hostname are the last six digits of the MAC O address you copied from the serial number label on the unit.

You should now be prompted for a username and password. The factory default credentials are:

Username: **spadmin**

Password: **admin123**



Note: If you do not have physical access to the unit, you can obtain the MAC O address by accessing VersaSync's CLI via the I/O connector USB port, using e.g., the `ifconfig` command.

Once you logged into the VersaSync via zeroconf, you can retrieve the DHCP address for future use:

- » Navigate to **MANAGEMENT: NETWORK > Network Setup**. In the **Ports** panel, click on the information button next to each Ethernet port. The popup window will display the assigned DHCP IP address for the selected port.

2.3 Assigning I/O Pins

VersaSync's I/O connector is software configurable, i.e. the pin interfaces and the signal modulations can be configured by the user via the VersaSync Web UI.

The software-configurable 26-pin I/O connector comprises 9 user-configurable Channels, plus one fixed USB interface. Channels can be used for the following input or output interfaces:

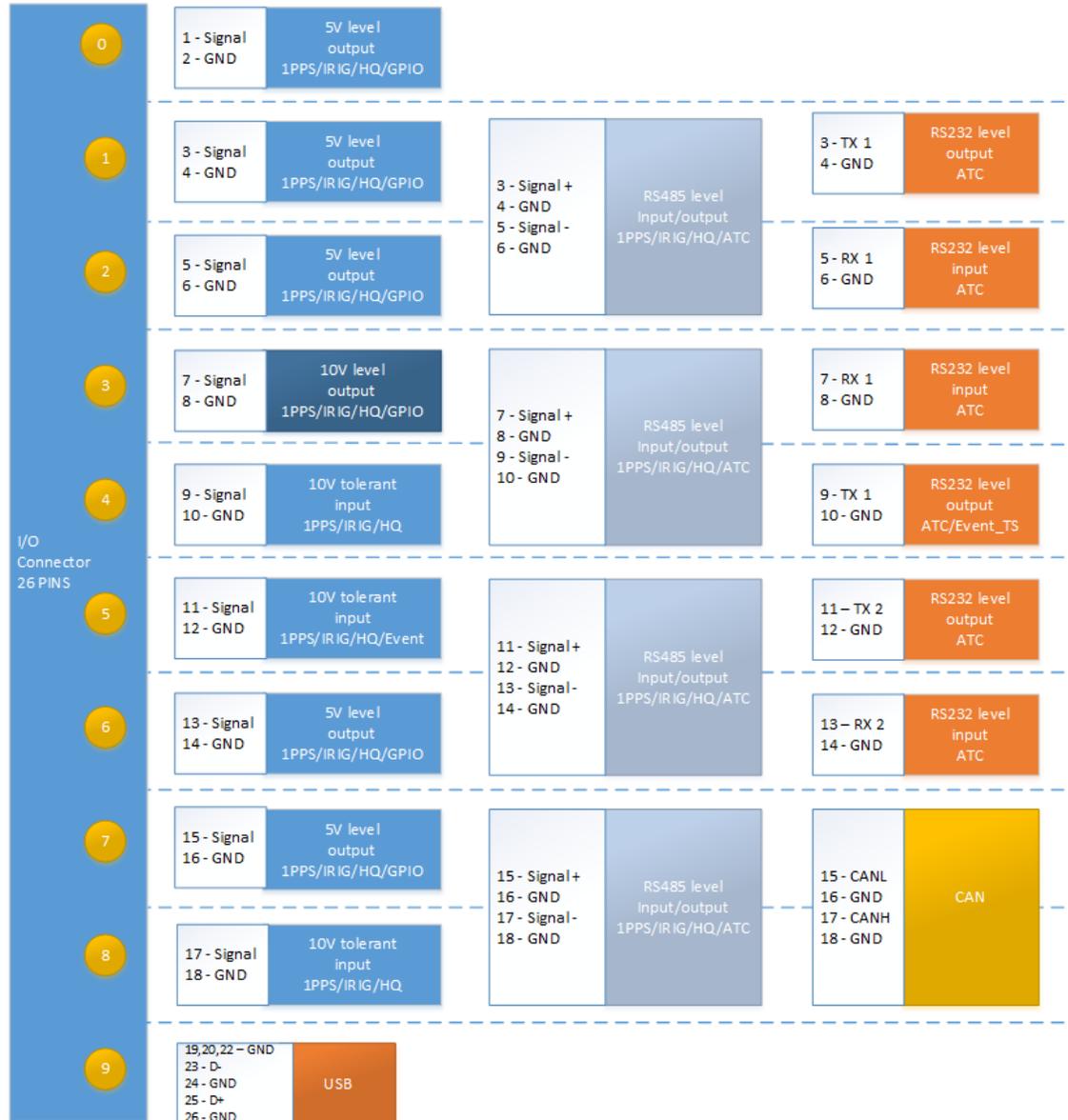


Figure 2-1: I/O configuration options

2.3.1 Signal Types

The table below shows the maximum number of available interfaces for each signal type. Note that you can assign only one signal for each pin pair, hence only four to nine input and output signals can be transmitted/received at any given time. For details, see the signal mapping table below.

Table 2-1: Available signal types

	DCLS, TTL	DCLS, 10V	RS485	RS 485, 120 Ω	RS232
PPS	out (5), in (2)	out (1), in (1)	out (4), in (4)	in (4)	
IRIG	out (5), in (2)	out (1), in (1)	out (4), in (4)	in (4)	
HQ	out (5), in (2)	out (1), in (1)	out (4), in (4)	in (4)	
GPIO	out (5)	out (1)			
ASCII			out (4), in (4)	in (4)	out (3), in (3)

Note: ASCII Time Code is abbreviated in the UI as **ATC**.

DCLS Signal Lines

Up to six TTL (5V) or 10V **DCLS** outputs and three DCLS inputs are available for e.g., 1PPS, xPPS, IRIG, HaveQuick, ASCII ToD signal transmission.

Single-ended Serial Lines

VersaSync provides up to 3 RX and 3 TX **RS232** interfaces for e.g., ASCII ToD – NMEA 0183 (ICD-GPS-153).

Differential Serial Lines

Up to four differential serial lines are available. Each of them can be set to **RS485** electrical standard, and used as input or output. PPS or Time-of-Day messages are available, as well as HAVE QUICK and other formats. Note that this kind of interface uses two Channels.

Non-Configurable Pins

Channel # 0 provides a DCLS TTL output signal that is not user-configurable.

Also note that **pins # 19 through 26** are reserved for the USB command line interface.

2.3.2 I/O Signal Mapping Table

Each Channel (i.e., each pin pair e.g., "3&4" = Channel 1) can serve as only one interface, and not all combinations are possible due to the internal multiplexer architecture.

The table below illustrates the signal combinations that can be assigned to the 18 configurable pins.

Table 2-2: I/O signal mapping to Channels

		Channel													
		0	1	2	3	4	5	6	7	8	9				
		Pin Position													
		1 & 2	3 & 4	5 & 6	7 & 8	9 & 10	11 & 12	13 & 14	15 & 16	17 & 18	19-25				
Time & Frequency	PPS	out	DCLS	TTL	Y	Y	Y				Y	Y			
	IRIG	out	DCLS	TTL	Y	Y	Y				Y	Y			
	HQ	out	DCLS	TTL	Y	Y	Y				Y	Y			
	GPIO	out	DCLS	TTL	Y	Y	Y				Y	Y			
	ATC	out	RS232												
	PPS	out	RS485				Y	Y							
	IRIG	out	RS485				Y	Y	Y				Y		
	HQ	out	RS485				Y	Y	Y				Y		
	ATC	out	RS485				Y	Y	Y				Y		
	PPS	in	RS485				Y	Y	Y				Y		
	PPS	in	RS485	Load			Y	Y	Y				Y		
	IRIG	in	RS485				Y	Y	Y				Y		
	IRIG	in	RS485	Load			Y	Y	Y				Y		
	HQ	in	RS485				Y	Y	Y				Y		
	HQ	in	RS485	Load			Y	Y	Y				Y		
	ATC	in	RS485				Y	Y	Y				Y		
	ATC	in	RS485	Load			Y	Y	Y				Y		
	ATC	in	RS232								Y				
	PPS	out	DCLS	10V			Y								
	IRIG	out	DCLS	10V			Y								
	HQ	out	DCLS	10V			Y								
	GPIO	out	DCLS	10V			Y								
	PPS	in	DCLS	10V					Y						
	IRIG	in	DCLS	10V					Y						
	HQ	in	DCLS	10V					Y						
	PPS	in	DCLS	TTL						Y				Y	
	IRIG	in	DCLS	TTL						Y				Y	
	HQ	in	DCLS	TTL						Y				Y	
	OPTION CARD														
	ATC EVENT	out	RS232				Y	Y	Y	Y	Y	Y	Y	Y	
	GPIO EVENT	in	DCLS	TTL						Y					
	CAN BUS	in/out												Y	

Notes:

Pins to Channels (e.g., pins 3 & 4= Channel 1)

green = Signal Message Type can be assigned to this Channel (RS485 requires two Channels)

red = This Signal Message type cannot be assigned to this Channel

ATC = ASCII Time Code

Configuring a new Input or Output

1. In the VersaSync Web UI, navigate to **MANAGEMENT > NETWORK: Pin Layout**. The **Pin Layout** screen will be displayed.
2. Prior to assigning the new output, identify a pin pair in the pin **Layout** table that is not used (Signal = "None") or not needed. You can **Delete** it, but you may also simply assign the new PPS Output as described below, thus overwriting the existing Input or Output.
3. Add a pin configuration by clicking the PLUS icon in the top-right corner. The **Add Pin** window will display.
4. Start with the **Type Filter** drop-down menu (second line in the window) and select a signal type.

5. From the **Signal** drop-down menu, select a signal.
6. From the **Pins** drop-down menu in line 3, select the pin pair you chose in Step 2. (Note that you will need 4 pins if you selected a RS485 signal Type.)
7. Click **Submit**.
8. In the **Actions** panel, click **Apply Changes**.

Restoring the Default I/O Configuration

VersaSync is shipped with a default I/O configuration that you can be customized. However, if required you can restore the default configuration at any time after applying changes.

The following illustration shows the **default I/O pin configuration**:

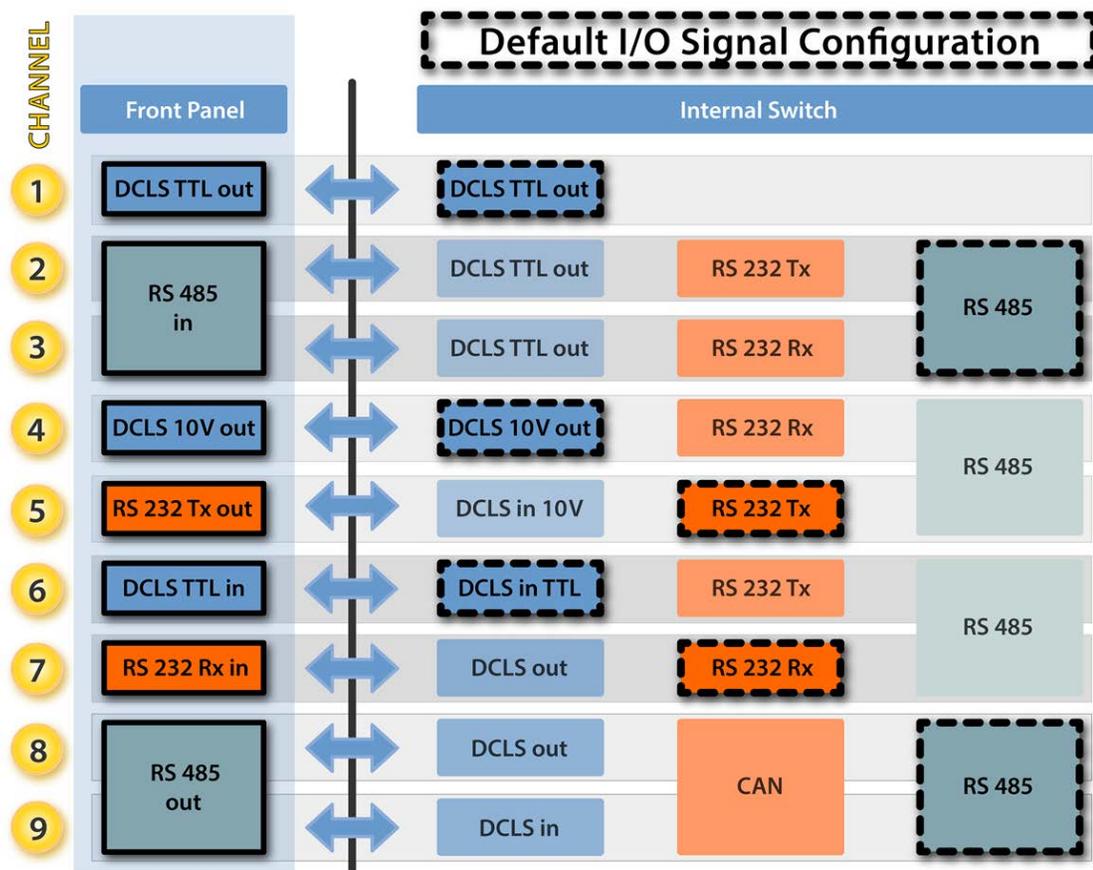


Figure 2-2: Default I/O configuration

To restore the default I/O pin configuration:

- A. Navigate to the **MANAGEMENT: NETWORK > Pin Layout** screen.
- B. In the **Actions** panel on the left, click **Restore Default Layout**.

Reloading the Current I/O Configuration

To reload the currently used I/O configuration after adding pin layout changes, but before clicking **Apply Changes**:

- A. Navigate to the **MANAGEMENT: NETWORK > Pin Layout** screen.
- B. In the **Actions** panel on the left, click **Reload Layout**.

SAFETY

Table 3-1: Safety symbols used on this product or in this document

Symbol	Signal word	Definition
	DANGER!	Potentially dangerous situation which may lead to personal injury or death! Follow the instructions closely.
	CAUTION!	Potential equipment damage or destruction! Follow the instructions closely.
	NOTE	Tips and other useful or important information.
	ESD	Risk of Electrostatic Discharge! Avoid potential equipment damage by following ESD Best Practices.
	CHASSIS GROUND	This symbol is used for identifying the functional ground of an I/O signal. It is always connected to the instrument chassis.
	Analog Ground	Shows where the protective ground terminal is connected inside the instrument. Never remove or loosen this screw!
	Recycle	Recycle the mentioned components at their end of life. Follow local laws.

3.1 SAFETY: Before You Begin Installation



DANGER! If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

DANGER! — INSTALLATION OF EQUIPMENT:



Installation of this product is to be done by authorized service personnel only. This product is not to be installed by users/operators without legal authorization.

Installation of the equipment must comply with local and national electrical codes.

DANGER! — DO NOT OPEN EQUIPMENT, UNLESS AUTHORIZED:



The interior of this equipment does not have any user serviceable parts. Contact Spectracom Technical Support if this equipment needs to be serviced. Do not open the equipment. Follow Spectracom Safety Instructions, and observe all local electrical regulatory requirements.

Caution: Electronic equipment is sensitive to Electrostatic Discharge (ESD). Observe all ESD precautions and safeguards when handling Spectracom equipment.



3.2 Regulatory Compliance

While the Evaluation Kit (EVK) of this product has not been tested against all standards below, the production version is planned to be in compliance with the following regulatory publications:

MIL compliance

- » Tested in accordance with MIL-STD-810G:
 - » MIL-STD 810G, 506.6
 - » MIL-STD 810G, 509.6
 - » MIL-STD 810G, 516.7
 - » MIL-STD 810G, 514.7

- » MIL-461F Testing (EMI/EMC):
 - » MIL-STD-461F CE102 Conducted Emissions, Power Leads
 - » Note: Frequency Range: 10 kHz to 10 MHz; Test Limits: Figure CE102-1
 - » MIL-STD-461F CS101 Conducted Susceptibility, Power Leads
 - » Note: Frequency: 30 Hz to 150 kHz; Test Levels: Figure CS101-1 (Curve #2)
 - » MIL-STD-461F RE102 Radiated Emissions, Electric Field
 - » Note: Frequency Range: 10 kHz to 18 GHz; Test Limits: Figure RE102-3
 - » MIL-STD-461F CS114 Conducted Susceptibility, Bulk Cable Injection
 - » Note: Frequency Range: 10 kHz to 200 MHz

FCC compliance

This equipment has been tested and found to comply with the limits for a **Class A digital device**, pursuant to **Part 15 of the FCC Rules**.

These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a **commercial environment**. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the user documentation, may cause harmful interference to radio communications.

Operation of this equipment in a **residential area** is likely to **cause harmful interference** in which case the user will be required to correct the interference at his/her own expense.

Other compliance

- » EN 60068-2-6
- » RoHS, WEEE compliant.

Technical Support

To request technical support for your VersaSync unit, please go to the ["Timing Support" page](https://www.orolia.com/support/timing) of the Orolia website (<https://www.orolia.com/support/timing>), where you can not only submit a support request, but also find additional technical documentation.

Phone support is available during regular office hours under the telephone numbers listed below.

To speed up the diagnosis of your VersaSync, please send us:

- » the current **product configuration** (navigate to TOOLS > Upgrade/Backup > System Configuration panel), and
- » the **events log**.

Thank you for your cooperation.

4.1 Regional Contact

Orolia operates globally and has offices in several locations around the world. The Orolia (Spectracom) main offices are listed below:

Table 4-1: Orolia contact information

Country	Location	Phone	Address
France	Les Ulis	+33 (0)1 64 53 39 80	Orolia France Parc Technopolis – Bat. Sigma 3, Avenue du Canada 91974 Les Ulis Cedex
USA	West Henrietta, NY	+1 585 321 5800	Orolia USA 45 Becker Rd, Suite A West Henrietta, NY 14586

Additional regional contact information can be found on the [Contact page](https://www.orolia.com/contact-us) of the Orolia website (<https://www.orolia.com/contact-us>).