

ELECTRONICS & DEFENSE

SecureSync

2400 MODEL



Getting Started Guide

Document Part No.: 2400-5000-0051

Revision: 4

Date: 6-June-2023



About this Guide

This Getting Started Guide is a supplement to the main user manual for SecureSync 2400. The latest version of the main user manual can be found online on the Safran Navigaiton & Timing website at: safran-navigation-timing.com/manuals.

© 2023 Safran.

Information furnished by Safran is believed to be accurate and reliable. However, no responsibility is assumed by Safran for its use, nor for any infringements of patents or other rights of third parties that may result from its use. Safran reserves the right to make changes without further notice to any products herein. Safran makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does Safran assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation consequential or incidental damages. No license is granted by implication or otherwise under any patent or patent rights of Safran. Trademarks and registered trademarks are the property of their respective owners. Safran products are not intended for any application in which the failure of the Safran product could create a situation where personal injury or death may occur. Should Buyer purchase or use Safran products for any such unintended or unauthorized application, Buyer shall indemnify and hold Safran and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable legal fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that Safran was negligent regarding the design or manufacture of the part.

Safran Electronics & Defense

safran-navigation-timing.com

Blank page.

CONTENTS

| | |
|-------------------------------------------------------|-----|
| About this Guide | iii |
| Product Overview | 1 |
| 1.1 SecureSync Front Panel | 1 |
| 1.1.1 Front Panel Keypad, and Display | 1 |
| 1.1.1.1 Using the Keypad | 2 |
| 1.1.1.2 Using the Front Panel Display | 2 |
| 1.2 Unit Rear Panel | 7 |
| 1.3 Mechanical and Environmental Specifications | 8 |
| 1.4 Interfaces | 9 |
| 1.4.1 GNSS Receiver | 9 |
| 1.4.2 10 MHz Output | 9 |
| 1.4.3 Multi I/O | 10 |
| 1.4.4 DCLS Output | 12 |
| 1.4.4.1 1PPS Output | 12 |
| 1.4.5 10/100/1000 Ethernet Port (RJ45) | 13 |
| 1.4.6 10/100/1000 Ethernet Port (SFP) | 13 |
| 1.4.7 RS-232 Serial Port (Rear Panel) | 13 |
| 1.4.8 USB Serial Port (Front Panel) | 13 |
| 1.4.9 Input Power | 13 |
| 1.5 The SecureSync Web UI | 14 |
| 1.5.1 The Web UI HOME Screen | 14 |
| Installation | 17 |
| 2.1 Main Installation Steps | 17 |
| 2.2 SAFETY | 17 |
| 2.3 Unpacking and Inventory | 19 |
| 2.4 Required Tools and Parts | 20 |
| 2.4.1 Required GNSS Antenna Components | 20 |
| 2.5 Mounting the Unit | 20 |
| 2.5.1 Rack Mounting (Ears) | 21 |
| 2.6 Connecting Network Cables | 23 |

| | |
|------------------------------------------------|----|
| 2.7 Connecting the GNSS Input | 24 |
| 2.8 Powering Up the Unit | 24 |
| 2.8.1 Hot Swap Power Supply | 25 |
| 2.8.1.1 Hot Swap Installation | 26 |
| 2.8.1.2 Hot Swap Monitoring | 26 |
| 2.9 Network Setup | 30 |
| 2.9.1 Network connection (common tasks): | 30 |
| Technical Support | 33 |
| 3.1 Regional Contact | 33 |

Product Overview

This section is designed to help you become familiar with the structure, features, and functions of the SecureSync 2400.

1.1 SecureSync Front Panel

The front panel of a SecureSync unit consists of:

- » an LED time display
- » seven illuminated status LED menu buttons
- » a front panel control keypad
- » an OLED information display menu
- » micro-B USB serial console
- » intake for temperature-controlled cooling fans

The OLED information display is configurable using the front panel controls. The micro USB serial interface and the front panel controls provide a means to configure the unit's network settings and perform other functions without requiring access to the Web UI.

SecureSync units with the SAASM GPS receiver option module installed also have an encryption key fill connector and key zeroize pin switch on the left-hand side of the front panel.

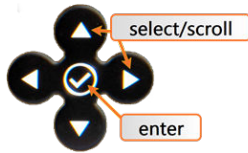


Figure 1-1: SecureSync front panel layout

1.1.1 Front Panel Keypad, and Display

To simplify operation and to allow local access to SecureSync, a keypad and an OLED information display menu are provided on the front panel of the unit.

1.1.1.1 Using the Keypad



The functions of the five keys are:

- » ◀▶▲▼ arrow keys: Navigate to a menu option (will be highlighted); move the focus on the screen; switch between submenus
- » ▲▼ arrow keys: Scroll through parameter values in edit displays; move the focus on the screen
- » ✓ ENTER key: Select a menu option, or confirm a selection when editing
- » ⏻ ⚙️ ↺ ⏻ ⏴ ⚙️ ⚠️ menu buttons: Press these buttons to navigate to each of the seven main menus.

1.1.1.2 Using the Front Panel Display

There are seven main menu screens on the SecureSync front information display.



Figure 1-2: Status LED menu buttons

1. Your front panel screen will timeout and darken after two minutes of inactivity. If your screen is dark, press any menu or keypad button to wake.
2. Press a menu button to enter that menu on the front panel display.
3. After entering a menu, the cursor will automatically begin on the submenu selection that you last visited.
4. Use the left and right buttons to switch between submenus if necessary.
5. To enter into a submenu body, press the down button. You will only be able to highlight fields that can be changed.

6. If the field has arrows on either side of your selection, use the directional arrow keys;
OR:
7. If the line is highlighted, press the ENTER button to change a value, and use the directional keys to obtain the desired setting.
8. Once your editing is done, press the ENTER button.
9. Press ENTER again to confirm your choice in the confirmation menu that will appear on the right side of the screen.

The main menu options and their functions are as follows:



Power Menu:

» Management

```

⏻ _MANAGEMENT _SYSTEM _____
Halt
Reboot
Restore Factory Default
    
```

- » halt the unit
- » reboot the unit
- » restore the factory defaults

» Monitoring

```

⏻ _MANAGEMENT _MONITORING _SYSTEM _____
Board Temp: 38 C
CPU Temp: 36.7 C
OSC Temp: 31.8 C
Fans Speed: 5610
    
```

- » view the temperature status: Board Temp, CPU Temp, and OSC (oscillator) Temp
- » view the Fan(s) Speed

» System

```

⏻ _MANAGEMENT _MONITORING _SYSTEM _SYSTEM _____
Model number: 2406-013      Serial Number: 324
Version: 1.2.0-rc6
Licenses: GNSS,AGPS,BSH,PTP
Option Card(s): None 2:None 3:PPS I/O 4:ATC 232 5:PPS T
    
```

- » view model number
- » view serial number
- » view software version
- » view licenses
- » view a rolling ribbon of option cards installed

» Hot Swap

- » this sub menu will only be available if you have a Hot Swap Power Supply configuration. See "[Hot Swap Power Supply](#)" on page 25 for more information.



GNSS Antenna Menu:

» Constellations

```

% _/CONSTELLATIONS _/SETTINGS _/MONITORING _
GPS      ON   Galileo OFF
GLONASS  ON   QZSS  ON
BeiDou   OFF  SBAS   OFF

```

- » view the status for GPS, GLONASS, BeiDou, Galileo, QNSS, and SBAS
- » turn reception OFF or ON to any satellite system by selecting the status

» Settings

```

% _/CONSTELLATIONS _/SETTINGS _/MONITORING _
Receiver Mode: Mobile - Land
Position: N 43 4 '0" I W 77 35 '0" I 167.79 m
Delay: 000 ns

```

- » view or change receiver position mode
- » view or set position
- » view or change delay

» Monitoring

```

%  CONSTELLATIONS  SETTINGS  (MONITORING)
      ^GPS^
Antenna: OK   sat  003  004  007  008  009
PPS:   Valid SNR   42   43   46   43   48
Time:   Valid sat  022  023  026  027  029
State:   30   SNR   34   49   51   48   29

```

- » view the following information:
- » antenna status
 - » PPS validity
 - » time validity
 - » state
- » view for each satellite system:
- » chart of all visible satellites



Inputs Menu:

» Settings

```

% _/SETTINGS _/MONITORING
Priority References (Time/PPS) State Time PPS
1      gps0                    ON    OK   OK
2      wrd0                    ON    NO   NO
3      asc0                    ON    NO   NO
4      asc1                    ON    NO   NO

```

- » view reference table
- » enable or disable references

» Monitoring

```

⏻ _ SETTINGS _ /MONITORING \
                                0: gps0
State:      Enabled
Time:      Valid
PPS:      Valid
Phase error: 279405ns

```

- » view each input reference
- » view reference state, time, validity, and phase error

⏻ Time Menu:

» Settings:

```

⏻ (SETTINGS) MONITORING
      Turkey      Indiana-Starke
Timezone: US      Michigan
      Universal   Mountain

```

change the current time display

» Monitoring:

```

⏻ _ SETTINGS _ /MONITORING \
Oscillator type: OCXO Std. Performance
Disciplining state: Lock
TFOM value: 2

```

view the oscillator type, disciplining state, and TFOM value

» Date:

```

⏻ _ SETTINGS _ MONITORING _ /DATE \
11 OCT 2022

```

view the Day Month Year.

↺ Outputs Menu:

» Settings

```

↺ _ /SETTINGS \
References  State  Format
0 PPS Output 0 ON    Pulse
1 ASCII Output 0 ON    None/None/None
2 IRIG Output 0 ON    DCLS/IRIG-B
3 IRIG Output 1 ON    AM/IRIG-B

```

- » view list of outputs available
- » see outputs format
- » enable or disable outputs

**Network Menu:**

- » Settings: Scroll to each ETH connection to view information or perform actions:

```

[SETTINGS] MONITORING
eth0
DHCP:      ON
IPv4 addr: 010.010.224.098/19
Gateway:   010.010.224.001
MAC addr:  00:0C:EC:0E:51:7A

```

- » enable or disable DHCP
- » view or set IP address
- » view or change gateway
- » view MAC address

- » Monitoring: View a graph for each ETH connection (highlight eth0 or eth1 and toggle left and right)

```

[SETTINGS] MONITORING
eth0
Link: Up/FullDuplex
SFP: NoModule
BR: 9840 Bps
BSR: 434866 Bps

```


**Alerts Menu:**

- » Status

```

[STATUS] MONITORING TESTS
1 Major Alarm(s):
Cause 1: Not In Sync
1 Minor Alarm(s):
Cause 1: Hot Swap Warning, Minor Alarm

```

- » show current major or minor alarms and descriptions

- » Monitoring

```

[STATUS] MONITORING TESTS
Memory Used: 28.2%
CPU Used:    49%
Disk Used:   13.3%

```

- » monitor memory usage
- » monitor CPU usage
- » monitor disk usage

- » Test

```

[STATUS] MONITORING TESTS
Press VALID to start testing the buttons

```



- » confirm that the buttons on your front panel are working (highlight Press VALID to start testing buttons and push the ✓ ENTER key).

1.2 Unit Rear Panel

The SecureSync rear panel contains the connectors for all input and output references.

- » GPS/GNSS antenna connector (SMA)
- » 10 MHz output (BNC female connector)
- » Multi I/O (sub HD15 connector)
- » 1PPS out, configurable DCLS Output (BNC female connector)
- » ETH0 1GB Ethernet (RJ45 connector)
- » ETH1 Ethernet (SFP connector)
- » Serial console (RJ45 connector)
- » Two or six slots for option cards
- » AC power input connection

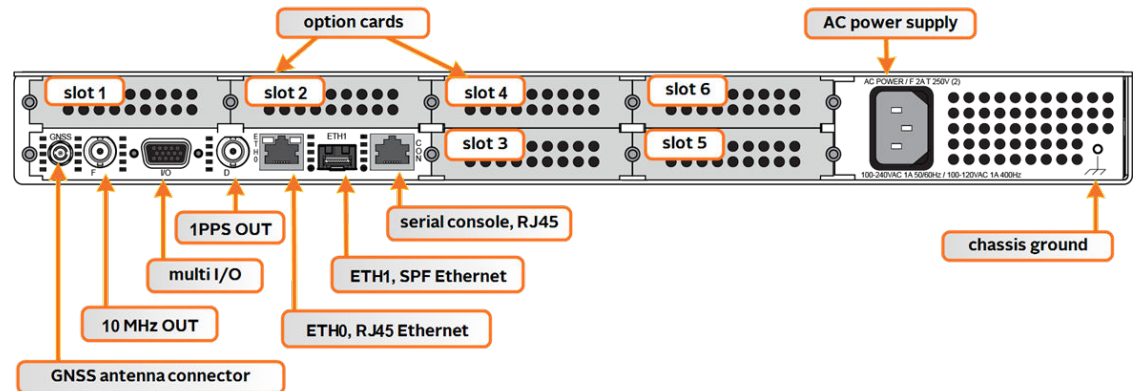


Figure 1-3: Standard rear panel

Optional input/output connectors depend on the installed option cards.

Typically, option cards will be installed at the factory. Should you purchase an extra option card at a later point, you will need to undergo field installation (for technically proficient service personnel only).

1.3 Mechanical and Environmental Specifications

Dimensions:

- » Designed for EIA 19" rack mount:
- » Housing w/o connectors and brackets:
 - » 17.1" W x 1.74" H [1U] x 15.17" D actual
 - » (434 mm W x 44 mm H x 385 mm D)

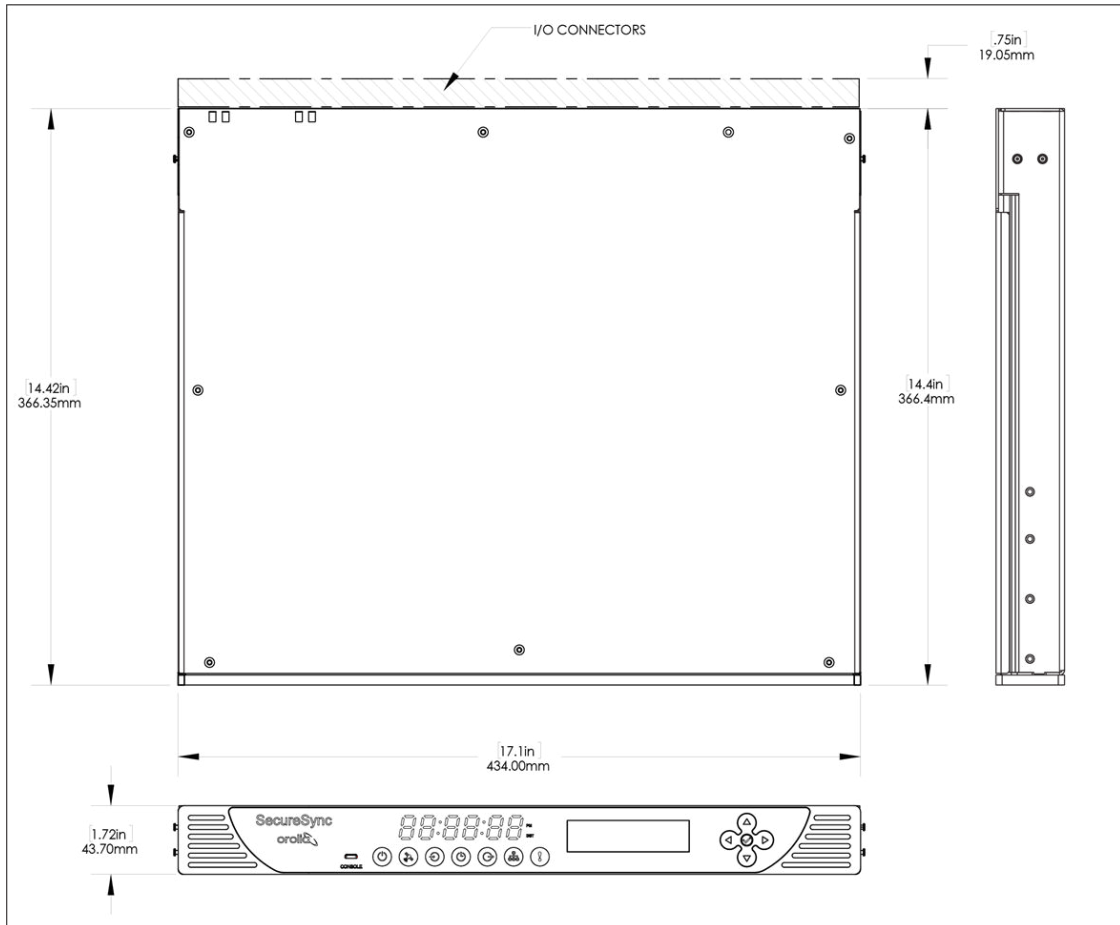


Figure 1-4: Mechanical dimensions

Weight: 6.0 lbs (2.72 kg) for base unit with AC power supply

Temperature:

- » Operating: -20°C to +65°C (55°C with Rubidium oscillator option)
- » Storage: -40°C to +85°C

Humidity: 10% - 95% relative humidity, non-condensing @ 40°C

Altitude:

- » Operating: 100-240 V_{AC}: up to 13120 ft (3999 m)
- » Storage range: up to 45000 ft (13716 m)

Shock and Vibration (Operating and Storage):

- » Shock: 516.8 15g, 11 ms halfsine
- » Vibration: 514.8C-2 cat 4 and 514.8D-11, cat 21 1.1 g rms vertical and 0.8 g rms longitudinal

MIL-STD-810G: 500.6, 501.6, 502.6, 503.6, 507.6

MIL-STD-810H: 514.8, 516.8

1.4 Interfaces

The following specifications apply to the standard configuration of SecureSync. Information on option card specifications can be found in the main user manual.

1.4.1 GNSS Receiver

Model: u-blox M8T

Compatible signals:

- » GPS L1 C/A Code transmissions at 1575.42 MHz
- » GLONASS L1 OF transmissions centered at 1602.0 MHz
- » Galileo E1 B/C transmissions at 1575.42 MHz
- » BeiDou B1 transmissions centered at 1561.098 MHz
- » QZSS L1-SAIF transmissions at 1575.42 MHz

Satellites tracked: Up to 72 simultaneously

Update rate: up to 2Hz (concurrent)

Acquisition time: Typically < 27 seconds from cold start

Antenna requirements: Active antenna module, +5V, powered by SecureSync, 16 dB gain minimum

Antenna connector: SMA (SMA to N-type conversion cable included in auxiliary kit)

1.4.2 10 MHz Output

- » Signal: 10 MHz sine wave
- » Signal Level: +13 dBm ±2dB into 50 Ω

- » Harmonics: -40 dBc minimum
- » Spurious: -70 dBc minimum; -60 dBc minimum (Rb)
- » Connector: BNC female
- » Accuracy rating depends on the oscillator selected during the ordering process.

1.4.3 Multi I/O

The Multi I/O HD15-pin connector can be configured to provide different output and input types.

Connector: 15 pin D-Sub (HD15) female

Available signals:

- » DCLS IN:
 - » Input level 1.5 V (min), impedance 50 Ω
- » DCLS OUT:
 - » Output level 5 V (peak), impedance 50 Ω
- » IRIG AM OUT:
 - » Output impedance - 50 Ω
 - » Output level: 10 V (peak to peak max, user configurable)
- » RS232:
 - » Output level: ± 5.0 V, impedance 300 Ω
 - » Input level: -15 to 15 V (max), threshold 0.6 V min to 2.4 V max, impedance 3 k Ω min
- » RS485 (2):
 - » Output level: ± 1.5 V, impedance 54 Ω
 - » Input level: -7 to 12 V (max), sensitivity - ± 200 mV, impedance 12 k Ω min

Available Output Types : 1PPS, ASCII Time Code, IRIG (DCLS), IRIG (AM), HAVEQUICK, GPO

Available Input ("Reference") Types: 1PPS, ASCII Time Code, HAVEQUICK, IRIG (DCLS)

Pinout:

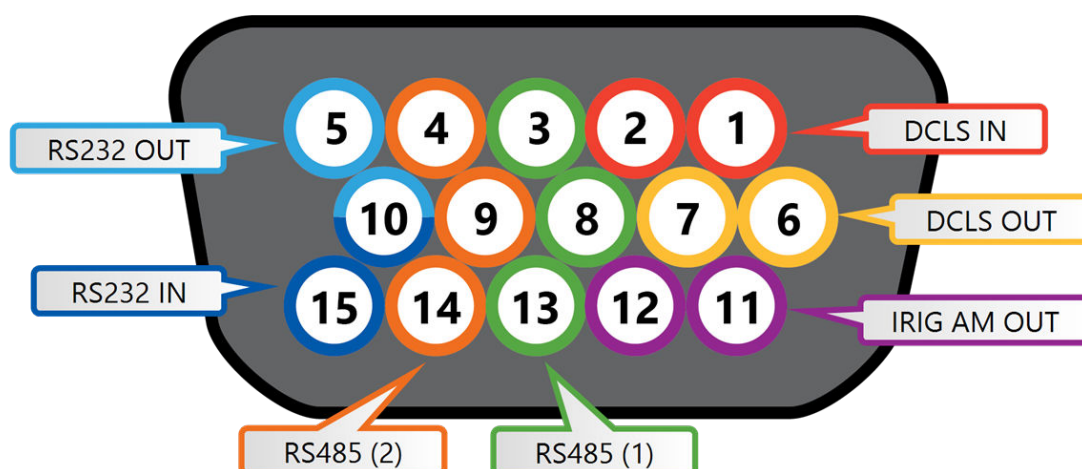


Figure 1-5: Multi I/O connector, viewed in mating direction on rear of unit

Table 1-1: Multi I/O connector signal pinout

| Pin | Signal |
|-----|----------------------------------------|
| 1 | DCLS IN |
| 2 | GND |
| 3 | (First signal) RS485 A, non-inverting |
| 4 | (Second signal) RS485 A, non-inverting |
| 5 | RS232 TX OUT |
| 6 | DCLS OUT |
| 7 | GND |
| 8 | GND |
| 9 | GND |
| 10 | GND |
| 11 | IRIG AM OUT |
| 12 | GND |
| 13 | (First signal) RS485 B, inverting |
| 14 | (Second signal) RS485 B, inverting |
| 15 | RS232 RX IN |

Table 1-2: Multi I/O signal defaults

| Pins | Channel | Default Signal |
|----------|-------------|--------------------|
| 6 & 7 | DCLS OUT | IRIG OUT |
| 1 & 2 | DCLS IN | IRIG IN |
| 15 & 10 | RS232 IN | ATC IN |
| 5 & 10 | RS232 OUT | ATC OUT |
| 3, 8, 13 | RS485 (1) | HAVEQUICK OUT |
| 4, 9, 14 | RS485 (2) | HAVEQUICK IN |
| 11 & 12 | IRIG AM OUT | IRIG OUT (AM ONLY) |

1.4.4 DCLS Output

The rear panel DCLS OUT BNC female connector defaults to a 1PPS Output (see below), but can be configured to produce different output signals: IRIG Output, HaveQuick Output, and GPIO Output.

1.4.4.1 1PPS Output

Signal: One pulse-per-second square wave (ext. reference connected to GNSS receiver)

Signal level: TTL compatible, 4.3 V minimum, base-to-peak into 50 Ω

Pulse width: Configurable pulse width (200 ms by default)

Pulse width range: 20 ns to 900 ms

Rise time: <10 ns

Accuracy: Positive edge within ± 50 ns of UTC when locked to a valid, traceable input reference

Connector: BNC female

Table 1-3: 1PPS output accuracies

| Oscillator Type | Accuracy to UTC (1 sigma locked to GPS) | Holdover (constant temp. after 2 weeks of GPS lock) | |
|--------------------------|--------------------------------------------|-----------------------------------------------------|----------------|
| | | After 4 hours | After 24 hours |
| Low-phase noise Rubidium | ± 15 ns | 0.2 μ s | 1 μ s |
| Rubidium | ± 15 ns | 0.2 μ s | 1 μ s |
| Low-phase noise OCXO | ± 15 ns | 0.5 μ s | 10 μ s |
| OCXO | ± 15 ns | 1 μ s | 25 μ s |
| TCXO | ± 50 ns | 12 μ s | 450 μ s |

1.4.5 10/100/1000 Ethernet Port (RJ45)

ETH0

Function: 10/100/1000 Base-T, auto-sensing LAN connection for NTP/SNTP and remote management and configuration, monitoring, diagnostics and upgrade

Connector: RJ45, Network IEEE 802.3

1.4.6 10/100/1000 Ethernet Port (SFP)

ETH1

Function: 10/100/1000 (speed depends on connection) Base-T, auto-sensing LAN connection for NTP/SNTP and remote management and configuration, monitoring, diagnostics and upgrade

Connector: Ethernet via SFP

1.4.7 RS-232 Serial Port (Rear Panel)

Function: Accepts commands to locally configure the IP network parameters via CLI for initial unit configuration.

Connector: RJ45

Character structure: ASCII, 115200 baud, 1 start, 8 data, 1 stop, no parity

1.4.8 USB Serial Port (Front Panel)

Function: Accepts commands to locally configure the IP network parameters via CLI for initial unit configuration.

Connector: micro-B USB (requires installed driver; if your driver does not automatically install, visit: <https://www.ftdichip.com/Drivers/VCP.htm>)

Character structure: ASCII, 115200 baud, 1 start, 8 data, 1 stop, no parity

1.4.9 Input Power

AC power source:

» 100 to 240 V_{AC}, ±10 %, 50/60 Hz

DC power source (option):

» 12-17 V_{DC} -15%, +20%, or

» 21-60 V_{DC} -15%, +20%, secure locking device

Maximum power draw:

- » TCXO/OCXO oscillator installed: 40 W normal (50 W start-up)
- » Rubidium (Rb) oscillator installed: 50 W normal (80 W start-up)
- » Low-Phase Noise (LPN) Rubidium oscillator installed: 52 W normal (85 W start-up)

Backup Battery: SecureSync has an internal battery to support the Real Time Clock. The battery is a small recharging lithium coin cell that is not customer-replaceable. This battery will keep approximate time and date in a shutdown state over ~135 days before requiring recharge. After full drain, the battery will require ~5 days to fully recharge. Minimum battery life is ~30+ years.

Hot Swap Power Supply: Some SecureSync models have hot-swappable power supplies and can ensure power redundancy in case of failure. Each power sled has the same specifications as the standard AC or DC specifications.

1.5 The SecureSync Web UI

SecureSync 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 SecureSync 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 Safran Service Contact Information and high-level system configurations you may be required to furnish when contacting Safran Navigation & Timing Service.

BLANK PAGE.

Installation






2.1 Main Installation Steps



1. Read the Safety instructions: "[SAFETY](#)" below.
2. Unpack the unit, and take inventory: "[Unpacking and Inventory](#)" on page 19.
3. Obtain required tools and parts: "[Required Tools and Parts](#)" on page 20.
4. Mount the unit: "[Mounting the Unit](#)" on page 20.
5. Connect Input References such as your GNSS antenna, and network cable(s): "[Connecting the GNSS Input](#)" on page 24, and "[Connecting Network Cables](#)" on page 23.
6. Power up the unit: "[Powering Up the Unit](#)" on page 24.
7. Setup basic network connectivity.

2.2 SAFETY

Safety: Symbols Used

Table 2-1: Safety symbols used in this document, or on the product

| Symbol | Signal word | Definition |
|-------------------------------------------------------------------------------------|-------------|--------------------------------------------------------------------------------------------------------------|
|  | DANGER! | Potentially dangerous situation which may lead to personal injury or death! Follow the instructions closely. |
|  | CAUTION! | Caution, risk of electric shock. |
|  | 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. |

| Symbol | Signal word | Definition |
|-----------------------------------------------------------------------------------|---------------|-------------------------------------------------------------------------------------------------------------------|
|  | 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. |

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 Safran Navigation & Timing Technical Support if this equipment needs to be serviced. Do not open the equipment, unless instructed to do so by Safran Navigation & Timing Service personnel. Follow Safran Navigation & Timing Safety instructions and observe all local electrical regulatory requirements.



DANGER! - IF THE EQUIPMENT MUST BE OPENED:

Never remove the cover or blank option card plates while power is applied to this unit. The unit may contain more than one power source. Disconnect AC and DC power supply cords before removing the cover to avoid electrical shock.


DANGER! – GROUNDING:

This equipment must be EARTH GROUNDED.

This product is grounded through the power supply. There is an additional, supplementary chassis ground on the rear panel.

Never defeat the ground connector or operate the equipment in the absence of a suitably installed earth ground connection. Contact the appropriate electrical authority or an electrician if you are unsure that suitable earth grounding is available.



DANGER! This unit might have more than one power supply connection. All connections must be removed to de-energize the unit

SAFETY: User Responsibilities

- » The equipment must only be used in technically perfect condition. Check components for damage prior to installation. Also check for loose or scorched cables on other nearby equipment.
- » Make sure you possess the professional skills, and have received the training necessary for the type of work you are about to perform.
- » Do not modify the equipment.
- » Use only spare parts authorized by Safran Navigation & Timing.
- » Observe generally applicable legal and other local mandatory regulations.

2.3 Unpacking and Inventory



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

Unpack the equipment and inspect it for damage. If any equipment has been damaged in transit, or you experience any problems during installation and configuration of your Safran Navigation & Timing product, please contact Safran Navigation & Timing.



Note: Retain original packaging for use in return shipments if necessary.

The following items are included with your shipment:

- » SecureSync unit
- » QuickStart Guide (printed version)
- » Ancillary items (except for rack mounting items, the contents of this kit may vary based on equipment configuration and/or regional requirements)
- » Purchased optional equipment (note that option cards listed on the purchase order will be pre-installed in the unit).

2.4 Required Tools and Parts

Depending on your application and system configuration, the following tools and parts may be required:

- » Phillips screwdrivers to install the rack-mount ears, and to mount the unit in a 19"-rack
- » Ethernet cables

2.4.1 Required GNSS Antenna Components

Should you plan on using a GNSS reference with your SecureSync, you will also need the following items (sold separately):

- » Antenna cable with SMA connector, or conversion cable



Note: The SMA-to-N-type conversion cable included in the ancillary kit is approved for pull weight of up to 60 lbs. If you are using a heavier cable, you will need to apply appropriate strain relief.

- » GNSS antenna with mounting bracket
- » GNSS antenna surge suppressor (recommended)
- » GNSS antenna inline amplifier (optional for short cable lengths)

2.5 Mounting the Unit

SecureSync units can be operated on a desktop or in a rack in a horizontal, right-side-up position. The location needs to be well-ventilated, clean and accessible.



Caution: For safety reasons the SecureSync unit is intended to be operated in a HORIZONTAL POSITION, RIGHT-SIDE-UP.

The SecureSync unit will install into any EIA standard 19-inch rack. SecureSync occupies one rack unit of space for installation, however, it is recommended to leave empty space of at least one rack unit above and below the SecureSync unit to allow for best ventilation.

Rack mounting requirements:

- » The maximum ambient operating temperature must be observed.
- » If the SecureSync unit is to be installed in a closed rack, or a rack with large amounts of other equipment, a rack cooling fan or fans should be part of the rack mount installation.
- » Installation of the unit in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.
- » Follow the mounting directions described below to prevent uneven mechanical loading, possibly resulting in a hazardous condition.
- » Do not overload power supply circuits. Use only supply circuits with adequate overload protection. For power requirements, see ["Input Power" on page 13](#).
- » Reliable grounding of rack-mounted equipment must be maintained. Particular attention must be given to supply connections other than direct connections to the branch circuit (e.g., use of power strips).

2.5.1 Rack Mounting (Ears)

The SecureSync **ancillary kit** contains the following parts needed for rack mounting:

- » 2 each 2400-1000-0714 equipment rack mount ears
- » 6 each HM20R-04R7-0010 M4 flat head Phillips screws

The 2400-0000-0704 ruggedization ancillary kit (optional) contains additional mounting items available for purchase:

- » 2 each 2400-1000-0706 rear rack mount ears
- » 2 each HM20R-04R7-0010 M4 flat head Phillips screws

The following customer supplied items are also needed:

- » 4 each #10-32 pan head rack mount screws
- » 1 each #2 Phillips head screwdriver
- » 1 each 3/32" straight screwdriver

To rack mount the SecureSync unit:

1. Attach the 2400-1000-0714 rack mount ears to the sides of the SecureSync with the ears facing outward, aligned with the front edge of the SecureSync front panel. (See image below). To secure, use the #2 Phillips screwdriver, and 3 each of the HM20R-04R7-0010 M4 flat head Phillips screws per side.

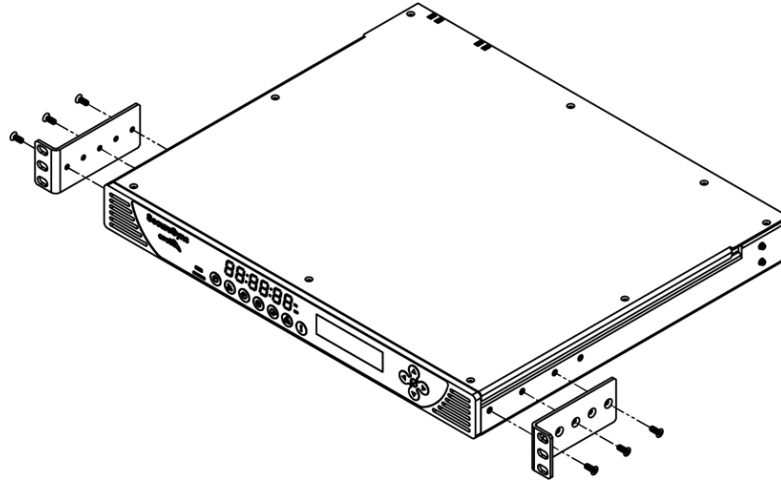


Figure 2-1: Rack mount installation

2. Secure the rack mount brackets to the rack using the #10-32 rack mount screws and #2 Phillips head screwdriver, 2 each per side of the rack.
3. If you purchased additional rear rack mounts, you will align the holes with the available pegs near the rear of the unit and slide the rail forward into place.

Secure the mount with the screw hole closest to the front of the chassis using 1 each of the supplied HM20R-04R7-0010 screws per side.

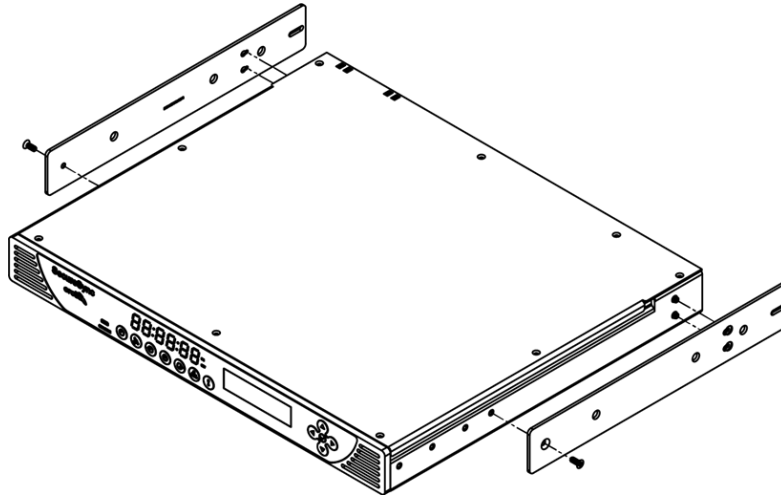
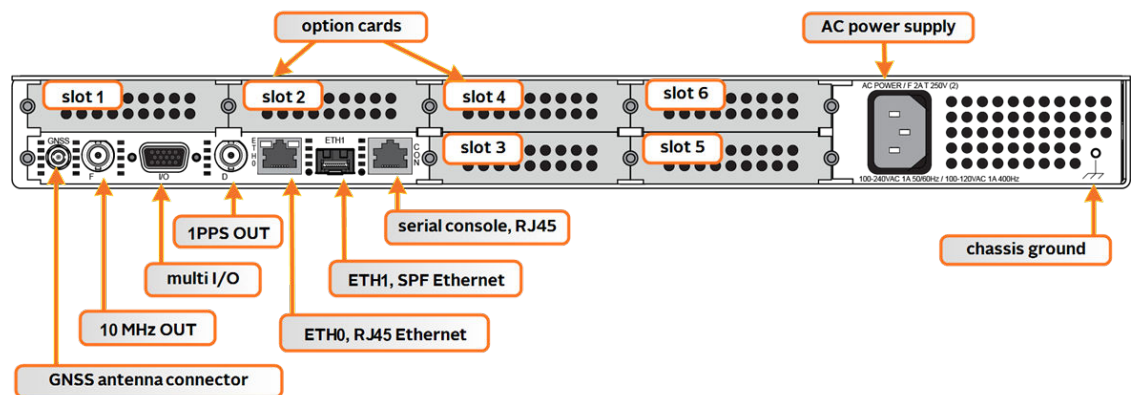


Figure 2-2: Rear rack mount installation

2.6 Connecting Network Cables



SecureSync includes two BASE 10/100/1000 Ethernet ports (ETH0- RJ45, and ETH1-SFP) for full NTP functionality, as well as a comprehensive web-based user interface ("Web UI") for configuration, monitoring and diagnostic support.

Before connecting the network cable(s), you need to decide which port(s) you want to use for which purpose (e.g., ETH0 for configuration only, etc.), and how you want to configure basic network connectivity e.g., the IP address:

- a. Configure SecureSync via the unit's front panel.
- b. Configure SecureSync by means of a PC connected to an existing network.
 - » When connecting to a hub, router, or network computer, use a straight-through wired, shielded CAT 5, Cat 5E or CAT 6 cable with RJ45 connectors (Eth0) or SFP connectors (Eth1). Connect one end to the Ethernet port on the SecureSync rear panel, and the opposite end of the cable to a network hub or switch.
- c. Configure SecureSync by connecting a stand-alone computer directly via a dedicated network cable (standard-wired, or crossover cable):
 - » When connecting directly to a stand-alone PC, use a network cable. Connect the cable to the NIC card of the computer.
Since no DHCP server is available in this configuration both SecureSync, and the PC must be configured with static IP addresses that are on the same subnet (10.1.100.1 and 10.1.100.2 with a subnet mask value of 255.255.255.0 on both devices, for example).

On Eth0: Once the unit is up and running, verify that the **green** link light on the Ethernet port is illuminated. The **amber** "Activity" link light may periodically illuminate when network traffic is present.

2.7 Connecting the GNSS Input

Typical installations include GNSS as an external reference input.

1. Install a GNSS antenna, surge suppressor, antenna cabling, and GNSS preamplifier (if required). Refer to the documentation included with your GNSS antenna for information regarding GNSS antenna installation.



Note: The SMA-to-N-type conversion cable included in the ancillary kit is approved for pull weight of up to 60 lbs. If you are using a heavier cable, you will need to apply appropriate strain relief.

2. Connect the GNSS cable to the rear panel antenna input jack.

2.8 Powering Up the Unit

1. After installing your SecureSync unit, and connecting all references and network(s), verify that power is connected, and wait for the device to boot up.



Note: SecureSync does not have a power switch. When the unit is plugged in, the power will be on.

2. Observe that the front panel illuminates. The time display will reset and then start incrementing the time.

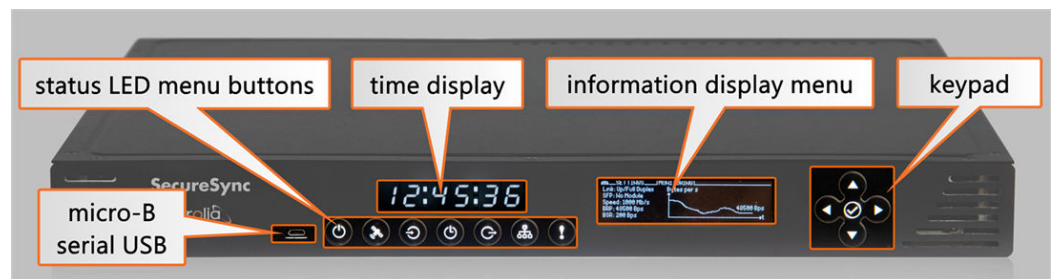





Figure 2-3: SecureSync front panel

1. Check the front panel status LED indicators:
 - » The Power  LED should be lit (not flashing).
 - » The GNSS  LED will be either OFF or flashing HEARTBEAT, since synchronization has not yet been achieved.
 - » The Alarms  LED light should be OFF (startup behavior) or HEARTBEAT (acquiring fix behavior). A FAST blinking pattern would indicate the unit requires attention.

2.8.1 Hot Swap Power Supply



DANGER! Remove the connected power source BEFORE attempting to remove a power sled for replacement.



Caution: Only use Safran-approved replacement parts. Incorrect parts may cause damage to the product.

The hot swap power supply (HSPS) option consists of two bays with redundant power systems. The sleds in the unit can be a mix of AC and DC power supplies. When both power supplies are active, the electrical draw is shared between the two bays. If one power sup-

ply is damaged or removed, the other bay will automatically take the entire power load without any additional configuration.

2.8.1.1 Hot Swap Installation

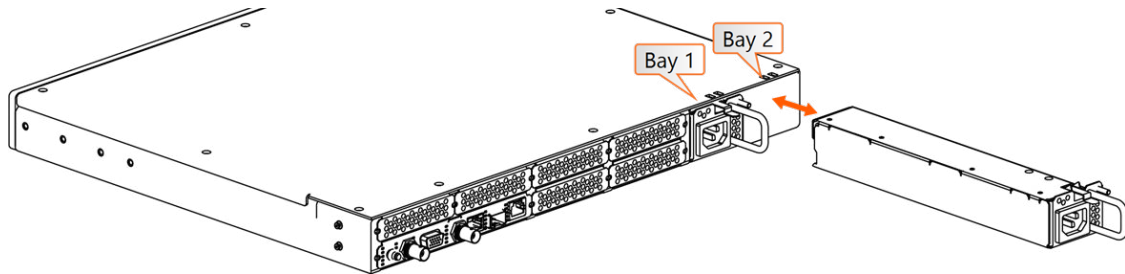


Figure 2-4: Hot Swap Power Supply installation (rear view)

To remove a power supply, first unplug the power input to be removed. (If you are working with a 12 V_{DC} (2-Pin) sled, you will need to remove the ground connection from the post after disconnecting power). Then, press the lever fully down and pull on the handle.

To install a power supply, first insert the sled until the latch clicks and the rear panel of the supply is aligned with the rear panel of the SecureSync. (Be sure to connect power AFTER the sled is fully inserted, and not before). Then, plug in the power input. (If you are working with a 12 V_{DC} (2-Pin) sled, you will also connect a grounding ring to the external post before connecting power).

2.8.1.2 Hot Swap Monitoring

After installing power supplies, functionality can be confirmed through the Web UI, CLI, front panel, or via SNMP.

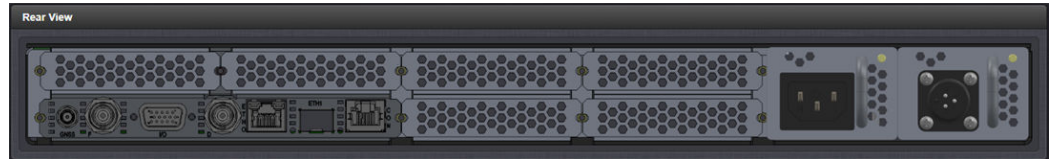
Web UI Hot Swap Monitoring

You can view the status of the power supplies through the Web UI: navigate to MANAGEMENT > OTHER > Hot Swap:

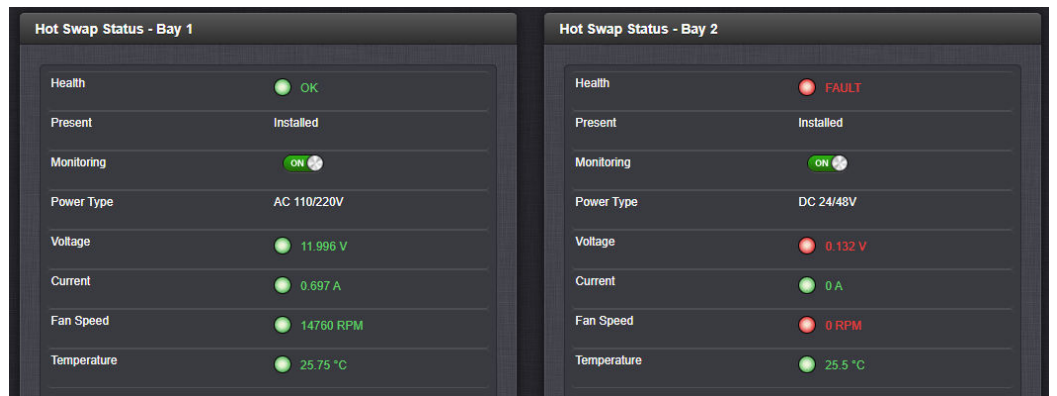
- » The Hot Swap Overall Status light at the top right of this page indicates whether the unit has at least one active, valid power supply.
 - » Green indicates all detected power supplies are valid
 - » The status will show yellow if one power supply is not valid.
 - » Red if there is no single HSPS module working properly (urgent need for replacement).
 - » Grey if the monitoring on both sleds has been disabled.

In this panel, you can also download (or clear) a file of the most recent monitoring information for both bays.

- » The Rear View panel of the Hot Swap page will display a rendering of the rear panel. You can hover over a power supply to confirm the bay number, and power specifications.



- » The Hot Swap Status panels for Bay 1 and Bay 2 each provide information and charts related to monitoring the power supplies of the unit, and contain the following elements:



- » Health: OK, Warning, Fault, or Monitoring Disabled
- » Present: Installed or Not Installed
- » Monitoring: ON/OFF. Monitoring of Hot Swap Power Supply statuses can be disabled to reduce logging and health status updates. This setting disables alarming in the case of power supply failure or issue (it is still possible to view statistics for the bay if monitoring is disabled).



Note: It is recommended to disable monitoring on a bay if you choose to remove a power supply long term or keep one inserted that you know is faulty. Disabling monitoring on a faulty supply or empty bay will cause the overall status to display as Okay (provided there is one fully functional power supply installed).

- » Power Type: AC 110/220 V, DC 12/24 V, or DC 24/48 V
- » Voltage (V)

- » Current (A)
- » Fan Speed (RPM)
- » Temperature (C°)


CLI Hot Swap Monitoring

Functionality and status of the Hot Swap Power Supplies can also be obtained by using the CLI command `HS_GetStatus`.

This command will return the overall Hot Swap status and total current, as well as the status and details for each of the bays (health status, present, power type, fan speed, temp, voltage, current, percentage).

Front Panel Hot Swap Monitoring

If your unit is configured with hot swappable power supplies, an additional menu will be visible on the front panel OLED information menu.

- » Press the  Power Menu button (you will need to press twice if the first press was waking up the display on the front panel).
- » Press the right button to highlight the Hot Swap sub-menu:

```

⏻ MANAGEMENT MONITORING SYSTEM (HOT SWAP)
Health: Warnins      Bay 1 Type: AC 110/220V
                   Fan Speed: 14790 RPM
                   Temperature: 25°C
Bay 1: OK           Voltage: 11.9957 V
Bay 2: Fault        Current: 0.958974 A

```


- » Press the down button to toggle between specific information for Bay 1 and Bay 2:

```

⏻ MANAGEMENT MONITORING SYSTEM (HOT SWAP)  ⏻ MANAGEMENT MONITORING SYSTEM (HOT SWAP)
Health: Warnins      Bay 1 Type: AC 110/220V  Health: Warnins      Bay 2 Type: DC 24/48V
                   Fan Speed: 14760 RPM        Fan Speed: 0 RPM
                   Temperature: 25.75°C         Temperature: 25.5°C
Bay 1: OK           Voltage: 12.0164 V          Bay 1: OK           Voltage: 0.132048 V
Bay 2: Fault        Current: 0.777656 A         Bay 2: Fault        Current: 0.0040233 A

```

In the case of faulty power supplies, the front panel will flash on the important parameter(s) to indicate the need for attention (in the image above, the issue on Bay 2 is with the fan speed and voltage).

- » You can also disable monitoring on a specific bay by pressing the  ENTER key while the bay is highlighted. Bays with disabled monitoring will be noted on the front panel:

```

⏻ MANAGEMENT MONITORING SYSTEM (HOT SWAP)
Health: OK           Bay 2 Type: DC 24/48V
                   Fan Speed: 0 RPM
                   Temperature: 25.5°C
Bay 1: OK           Voltage: 0.132048 V
Bay 2: Monitoring Disabled Current: 0 A

```



Note: Disabling monitoring on a single bay will remove it from consideration in the Overall Hot Swap Status and remove alarming for the bay.

SNMP/Notifications Hot Swap Monitoring

If your unit is configured with hot swappable power supplies, additional options will be visible in the Web UI under MANAGEMENT > Notifications in the System tab:

| | | | | |
|-------------------------|--------------------------|-------------------------------------|--------------------------|----------------------|
| Hot Swap, Minor Alarm | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="text"/> |
| Hot Swap, Minor Cleared | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="text"/> |
| Hot Swap, Major Alarm | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="text"/> |
| Hot Swap, Major Cleared | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="text"/> |

Hot Swap Power Supply Alarms

There are two Hot Swap specific alarms:

The Hot Swap, Major Alarm will cause the status to appear red in the Web UI and is triggered if one of the power supplies falls within the following thresholds:

- » Voltage (< 11V) or (> 13V)
- » Current (> 9A)
- » Fan Speed (< 10,000 RPM) or (> 18,000 RPM)

The Hot Swap, Minor Alarm will cause the status to appear yellow in the Web UI and is triggered if one of the power supplies falls within the following thresholds:

- » Temperature AC sled (<-25 °C) or (> 85°C)
- » Temperature DC sled (<-40 °C) or (> 85°C)
- » Unknown Sled Type installed



Note: An alarm can also be triggered if one of the power supplies is only partially inserted into the unit, and not inserted enough for the latch to click, or if you disconnect, but do not remove, a power supply. It is also possible that the hot swap power supply may shift during shipping or setup enough to trigger this alarm. In this case, remove the power supply and attempt to reinsert it.

2.9 Network Setup

There are three methods that can be used to communicate with your SecureSync in order to set up an IPv4 address and configure inputs and outputs; the best method will depend on your specific setup and connections.

- » The web user interface ("Web UI") is the most complete way to configure and monitor the unit. The Web UI is available through one of the Ethernet ports via a network connection. Using the Web UI requires a web browser.
- » The Command Line Interpreter ("CLI") is available through the USB serial port (front panel), or the RJ45 serial port (rear panel). The CLI can be either a means to configure the unit to allow access to the Web UI, or the principal means of communication with your SecureSync. Using the CLI requires a terminal emulator program.

The command `helpcli` provides a list of helpful commands (press q or ctrl c to exit) as does the main user manual.

- » The front panel display menu also allows monitoring and settings adjustments. Using the front panel display requires physical access to the unit.



Note: The default credentials for both the Web UI and the CLI are:
username: `spadmin`
password: `admin123`




Note: SecureSync's network settings have DHCP enabled by default.

2.9.1 Network connection (common tasks):

Identify the IP address assigned to your SecureSync:

Since the SecureSync defaults to DHCP, when a unit is connected to a DHCP-enabled network, an IP address should be assigned automatically. To identify the IP address and communicate with the SecureSync via the Web UI, follow one of the methods below.

On the front panel display:

1. Press the Network menu button 
2. Navigate to highlight Eth0 or press the RIGHT button to select Eth1
3. View the IP address

In the CLI:

- » The `net4` command will display the network IPv4 settings for each Ethernet port.

In the Web UI:

1. Navigate to MANAGEMENT > NETWORK > Network Setup.
2. Click on the information icon next to an Ethernet port to view all network settings for that port.

Identify your IP address using ZEROCONF

For when you don't have physical access to the unit or have "lost" your unit on a network.

1. Identify the MAC address (e.g., "00 0C EC 0E 51 7B"): on the serial number label on the side of your unit, on the front panel display in the Network menu, or through the CLI using the `ifconfig` command.


2. On a computer connected to the same LAN as your SecureSync, open your browser and (in the URL field) type the following: `securesync-[xxxxxx].local/` where [xxxxxx] of the hostname is the last six digits of the MAC address (e.g., "0E 51 7B").

You should now be connected to the unit Web UI and can login using the default credentials.

Disable or Enable DHCP

In order to assign an IP address to an Ethernet port, it is necessary to disable DHCP.

On the front panel display:

1. Press the Network  menu button
2. Select your Ethernet port: press the down button once to highlight Eth0 or press the RIGHT button to select Eth1
3. Navigate to the DHCP section. Highlight the current setting (either ON or OFF). To change the setting, press the verification button on the keypad, use the keypad directional arrows to choose the desired setting, and press the verification button twice to confirm your choice.

In the CLI:

Use the following command to set DHCP:

» `dhcp4set <intfc> <on|off>`, where the `intfc` is either `eth0` or `eth1`.

In the Web UI:


1. Navigate to MANAGEMENT > NETWORK > Network Setup.
2. Click on the gear icon next to an Ethernet port to change network settings for that port. If you are disabling DHCP, it is recommended to enter your settings before clicking Submit to avoid errors (see next section).

Set the IP address



Note: DHCP must be disabled before you can configure a static IP address (see above)

On the front panel display:

1. Press the Network menu button 
2. Select your Ethernet port: press the down button once to highlight Eth0 or press the RIGHT button to select Eth1
3. Navigate to the IP address section. Highlight the current setting. To change the setting, press the verification button on the keypad, use the keypad directional arrows to choose the desired setting, and press the verification button twice to confirm your choice.

In the CLI:

- » Use the command: `ip4set <intfc> <addr> <mask> [<gateway>]` where `intfc` is `eth0` or `eth1`; `addr` is the IPv4 address, (such as `192.168.100.12`), `mask` is the subnet mask (for instance, `255.255.255.0`) and the `gateway` is the (optional) network gateway.

In the Web UI:

1. Navigate to MANAGEMENT > NETWORK > Network Setup.
2. Click on the gear icon next to an Ethernet port. The Edit Ethernet Port Settings window will open. To change network settings for that port, including the IP address, enter your static IP address, netmask, and gateway (if needed).
3. Click Submit after all your changes have been entered, and start a new Web UI session by entering the new IP address into your browser and logging in.

To continue with other settings, such as NTP preferences, references, outputs, etc., see the main user manual: safran-navigation-timing.com/manuals.

Technical Support

To request technical support for your SecureSync unit, please go to the ["Timing Support" page](https://safran-navigation-timing.com/support-hub) of the Safran Navigation & Timing website, where you can not only submit a support request, but also find additional technical documentation: (<https://safran-navigation-timing.com/support-hub>).

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

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

- » the current product configuration, and
- » the events log.

Thank you for your cooperation.

3.1 Regional Contact

Safran Navigation & Timing operates globally and has offices in several locations around the world. The (formerly Orolia/Spectracom) main offices are listed below:

Table 3-1: Safran contact information

| Country | Location | Phone | Address |
|---------|--------------------|----------------------|-------------------------------------------------------------------------------------------------------|
| France | Les Ulis | +33 (0)1 64 53 39 80 | Safran Trusted 4D SAS Parc Technopolis - Bat. Sigma 3, Avenue du Canada 91974 Les Ulis Cedex |
| USA | West Henrietta, NY | +1 585 321 5800 | Safran Trusted 4D Inc. 45 Becker Rd, Suite A West Henrietta, NY 14586 |

Additional regional contact information can be found on the [Contact page](https://safran-navigation-timing.com/contact) of the Safran Navigation & Timing website (<https://safran-navigation-timing.com/contact>).