TrueNAS® ES24F Expansion Shelf Basic Setup Guide

Version 1.0

Contents

1 Introducing the ES24F 1
1.1 Safety 1
1.1.1 Static Discharge 1
1.1.2 Handling the System 1
1.2 Requirements 1
1.3 Unpacking the Unit 2
2 Ports and Indicators 3
3 Racking the ES24F 4
3.1 Rack Requirements 4
3.2 Chassis Rails 4
3.3 Install the Rack Rails 5
3.4 Push the System into the Rack 5
4 Handling Drives 6
4.1 Installing Drives into Trays 6
4.2 Inserting Drive Trays into the ES24F 6
5 Cabling 7
5.1 Connect Power Cords 7
5.2 Connect the Expansion Shelf 7
5.2.1 R-Series 7
5.2.2 X-Series 9
5.2.3 M-Series 9
6 Setting the ES24F Power Loss Mode 10
7 Documentation 10
8 Contacting iXsystems 10

1 Introducing the ES24F

The TrueNAS ES24F is a 2U expansion shelf with 24 2.5” drive bays, SAS3 (12 Gb/s), dual expansion controllers, and redundant power supplies.

Take a moment to review the safety considerations and hardware requirements before unpacking and installing an ES24F into a rack.

1.1 Safety

The ES24F is a sensitive electronic device. Take full safety precautions when installing or servicing a system.

1.1.1 Static Discharge

Static electricity can build up in your body and discharge when touching conductive materials. Electrostatic Discharge (ESD) is very harmful to sensitive electronic devices and components. Keep these safety recommendations in mind before opening the system case or handling system components:

1. Turn off the system and remove the power cable before opening the system case or touching any internal components.
2. Place the system on a clean, hard work surface like a wooden tabletop. Using an ESD dissipative mat can also help protect the internal components.
3. Touch the metal chassis with your bare hand before touching any internal component, including components not yet installed in the system. This redirects static electricity in your body away from the sensitive internal components. Using an anti-static wristband and grounding cable is another option.
4. Store all system components in anti-static bags.

More details about ESD and preventative tips can be found at https://www.wikihow.com/Ground-Yourself-to-Avoid-Destroying-a-Computer-with-Electrostatic-Discharge

1.1.2 Handling the System

An ES24F that has no drives installed weighs 34.1 pounds. **It is always recommended to team lift an empty ES24F.**

Do not attempt to lift an ES24F when it is fully populated with drives! It is recommended to install the system in a rack before adding drives and remove all drives before de-racking an ES24F.

Hold the system from the sides or bottom whenever possible. Always be mindful of loose cabling or connectors and avoid pinching or bumping these elements whenever possible.

These instructions use “left” and “right” according to your perspective when facing the front of a system or rack.

1.2 Requirements

It is recommended to have these tools available when installing an ES24F in a rack:

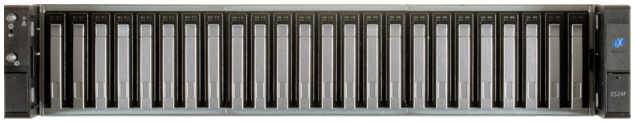
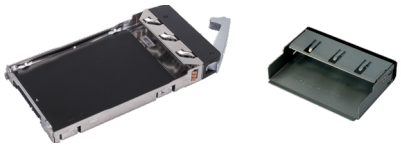
- #2 Philips head screwdriver
- Flathead screwdriver
- Tape measure
- Level

1.3 Unpacking the Unit

iXsystems products are carefully packed and shipped with trusted carriers to arrive in perfect condition. If there is any shipping damage or any parts are missing, please take photos and contact iXsystems Support immediately at support@ixsystems.com or **855-GREP4-iX (855-473-7449)** or **408-943-4100**.

Please locate and record the hardware serial numbers on the back of each chassis for quick reference.

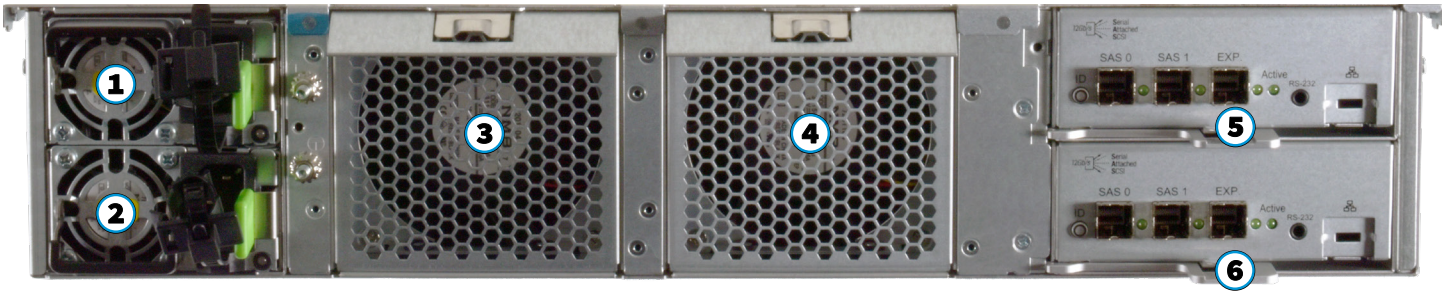
Carefully unpack the shipping boxes and locate these components:

	ES24F Expansion Shelf
	Set of rackmount rails with hardware. Kit includes 2 rail retention extenders, 2 short, 2 standard, and 2 long M4 screws
	Up to 24 populated 2.5” drive trays, depending on the purchase. Air baffles are installed in any remaining drive bays.
	Two 3-meter Mini SAS HD to Mini SAS HD cables.
	DB9 to 3.5mm serial cable
	Accessory kit with 2 IEC C13 to NEMA 5-15P power cords, 2 IEC C13 to C14 cords, and a set of velcro cable ties.

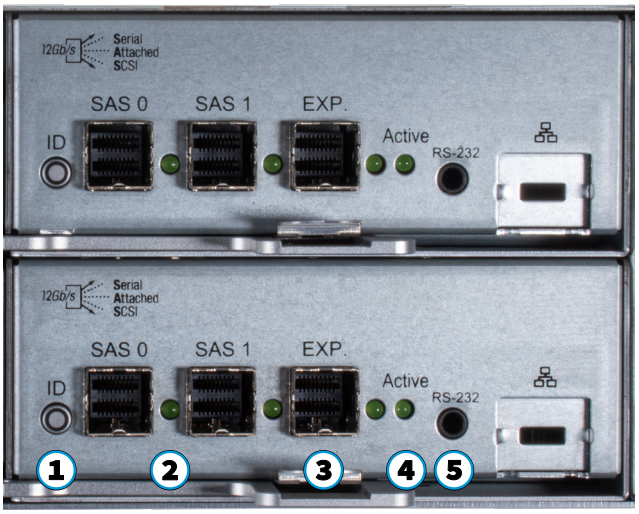
2 Ports and Indicators

ES24F buttons and indicators are located on the “ears” on the right and left edges of the system front.

The left ear has lighted buttons for power (**1**) and ID (**2**). There is also a light for system fault (**3**) and both ears have screw holes for securing the system to a rack behind small doors that swing up (**4**). The fault light illuminates during the initial power-on self-test (POST) or when the TrueNAS software generates an alert. The back panel has several replaceable components:



From left to right, the back panel has two power supplies, PSU1 (**1**) and PSU2 (**2**), case fans FAN1 (**3**) and FAN2 (**4**), and expansion controller 1 (**5**) and 2 (**6**). Expansion controllers have several ports and indicators:



Each expansion controller has an ID button (**1**), two HD Mini SAS3 connectors for connection to a host (**2**), another HD Mini SAS3 connector for expansion (**3**, not used), controller status light (**4**), and a mini jack for an RS-232 serial connection (**5**).

3 Racking the ES24F

To rack an ES24F, open the rail kit and remove the rails. Separate the chassis rails from the rack rails, then attach the chassis rails to the sides of the ES24F and install the rack rails in the rack. Team lift the system, align the chassis rails to the rack rails, and push the system into the rack.

Drives should only be installed in a system after it has been placed in the rack. It is also recommended to remove all installed drives **before** unracking a system.

Always team-lift a system when installing to a rack.

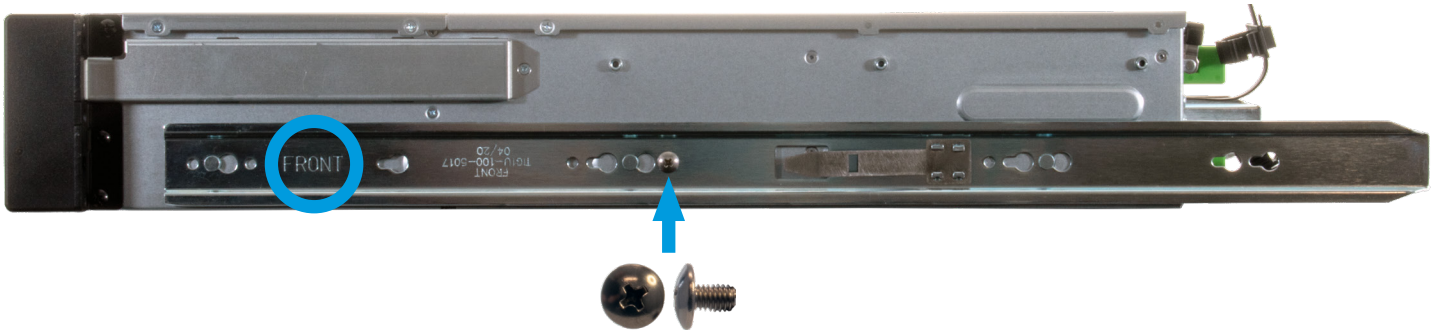
3.1 Rack Requirements

The ES24F requires an EIA-310 compliant rack. To properly install the rack rails, the vertical rack posts need to be spaced between **23" - 35.75" (584mm-908mm)** apart.

3.2 Chassis Rails

Each rail has two components, the outer rack rail and the inner chassis rail. To protect it during shipping, the chassis rail is inserted into the rack rail and must be removed before attaching to a system. Slide the chassis rail forward until the metal catch stops it in place. Push in the catch and continue to slide the chassis rail forward until it is free of the rack rail.

Take the chassis rail and align the end stamped "FRONT" with the front of the system. Fit the rail keyholes over the mounting pegs on the side of the system and slide it into place. Use one of the included short M4 screws to secure the rail to the system.

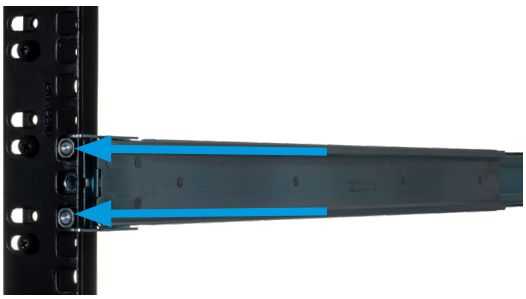


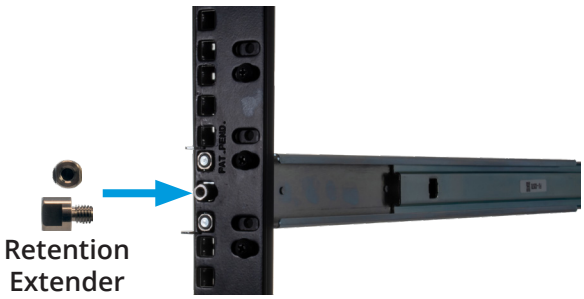
Follow this procedure to slide out and attach the second chassis rail to the other side of the system.

3.3 Install the Rack Rails

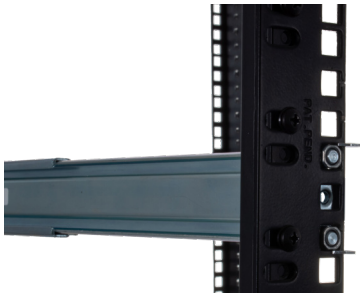
Before installing the rack rail, make sure the rack has enough space for the system. The ES24F needs 2U of space for both the system and rack rails, with the rack rails installed into the bottom 1U of the reserved space.

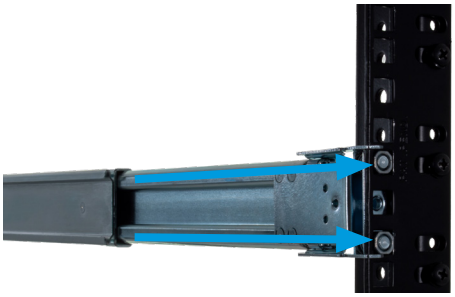
Take a rack rail and align the end stamped “FRONT” with the front of the rack. The “FRONT” text must be pointed **inside** the rack so the chassis rails can slide into the rack rails. Align the rail front pegs with the rack attach points and push the rail into the attach points. Fit the rail retention clip over the front of the rack by pushing on the spring plate to open the clip. The rail kit also includes two retention screw hole extenders that can be screwed into the middle rail attach point.





With the front of the rail installed, extend the back of the rack rail towards the equivalent attach points on the rear rack post. Make sure the rail remains level from front to back. Follow this process to install the other rack rail.





3.4 Push the System into the Rack

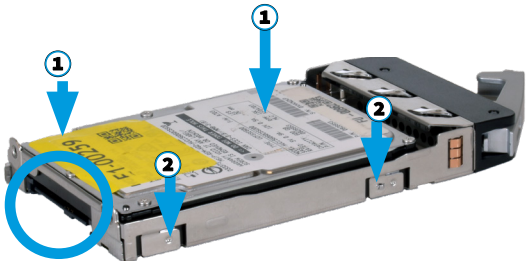
Team-lift the system and align the chassis rails with the rack rails. Slide the ends of the chassis rails into the rack rails and push the system forward until the metal safety catches click into place. Squeeze the safety catches against the sides of the system and continue to push the system forward until it is flush with the front of the rack.

The rail kit includes additional M4 screws that can be used to secure the system to the rack rails.

4 Handling Drives

TrueNAS appliances only support qualified hard drives and SSDs. Contact the Sales Team if you need more drives or replacements. Adding unqualified drives to the system voids the warranty. Call Support if drives are improperly installed in trays.

4.1 Installing Drives into Trays

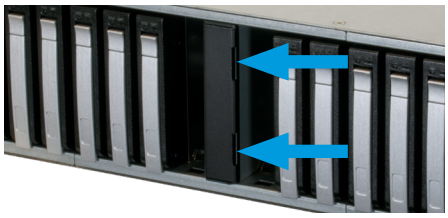


To insert a drive in a tray, align the drive connectors with the rear of the tray and drive side screw holes with the trays retention pegs. Push the drive side screw holes into the fixed retention pegs (**1**) then into the flexible retention pegs (**2**). The drive will click into place.

To remove a drive, push on the drive from the bottom of the tray to pop the drive out from the flexible retention pegs. Continue to lift the drive free from the tray.

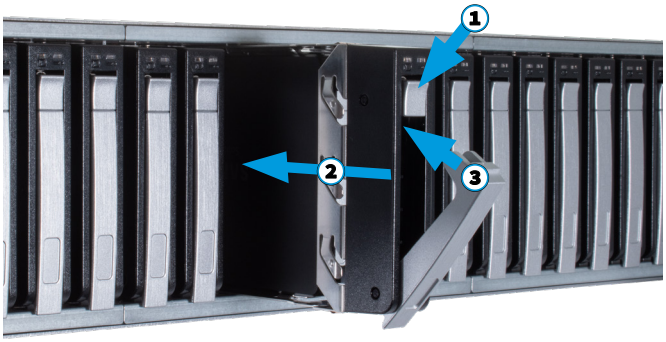
4.2 Inserting Drive Trays into the ES24F

When fewer than 24 drives are purchased with the system, air baffles are installed in all remaining drive tray slots. To install new drive trays in the system, you can remove a baffle by inserting a flathead screwdriver in one of the baffle grooves and gently pushing the baffle out of the slot. For proper airflow, it is recommended to keep all baffles in place, unless new drive trays are being installed.



Each drive tray has two indicator lights for status and fault. The status light is blue when the drive is active or a hot spare. The fault light is solid red when a drive error has occurred or an identify command has been sent.

Press the button on the drive tray to open the latch (**1**). Carefully slide the tray into a drive bay until the latch begins to swing closed (**2**). Gently push the latch closed until it clicks into place and the tray is secured in the chassis (**3**).

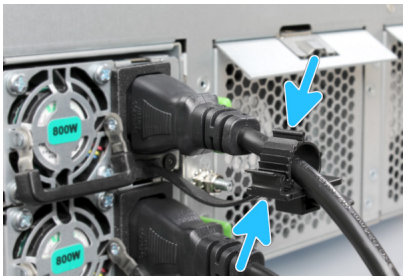


To remove a drive tray, press the button to open the latch, gently swing the latch fully open, and slide the tray out of the system.

5 Cabling

5.1 Connect Power Cords

Do not plug the power cords into a power outlet yet. Connect a power cord to the back of one power supply. Place the cord in the plastic clamp and press the tab into the latch to lock it in place. Repeat the process for the second power supply and cord.



5.2 Connect the Expansion Shelf

Plug the ES24F power cords into power outlets.

If the TrueNAS system is on, it can remain on while the expansion shelf is connected.

The ES24F is compatible with several TrueNAS systems. Typical SAS cable connections for connecting two ES24F systems to various TrueNAS High Availability (HA) systems are shown here.

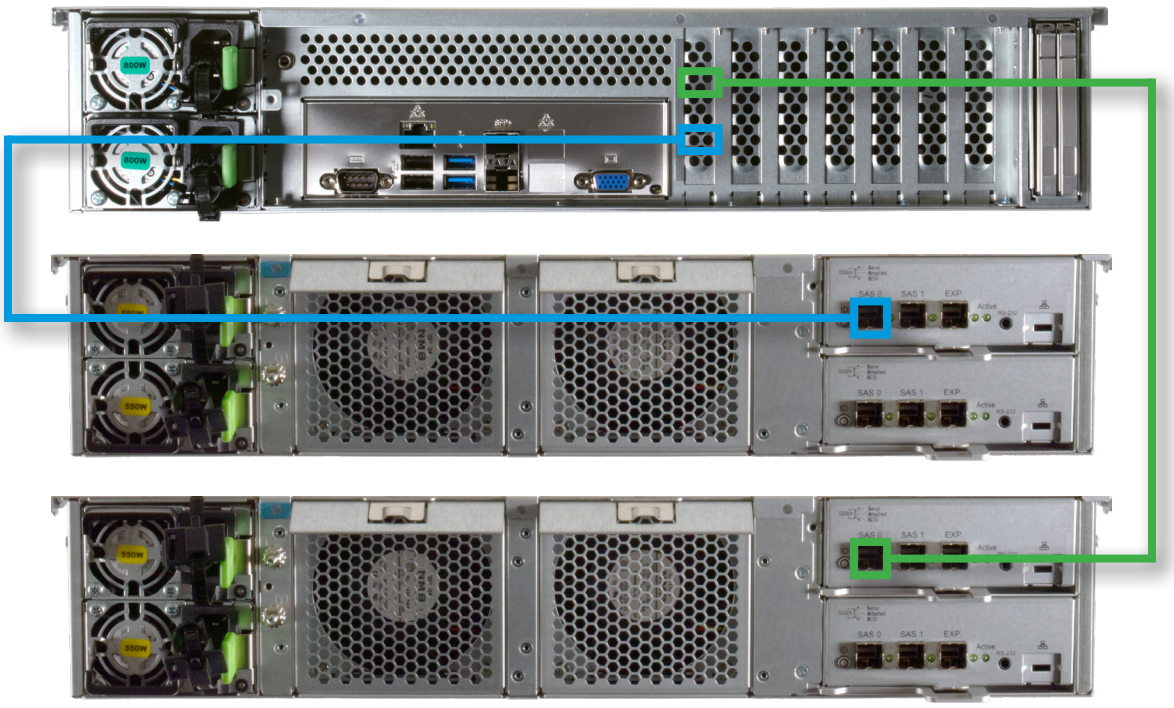
The typical connection order is **SAS port 0** on the **top ES24F expansion controller** to the first SAS port on the primary TrueNAS Controller. High Availability (HA) TrueNAS systems also connect the first SAS port on the secondary TrueNAS controller to the second ES24F expansion controller.

When connecting a second ES24F to a TrueNAS system, continue to use **SAS port 0** on the ES24F expansion controllers, but connect these to the second SAS ports on a TrueNAS system.

5.2.1 R-Series

R20, R40, and R50 systems with SAS expanders (not pictured) installed each support up to 2 ES24F expansion shelves:

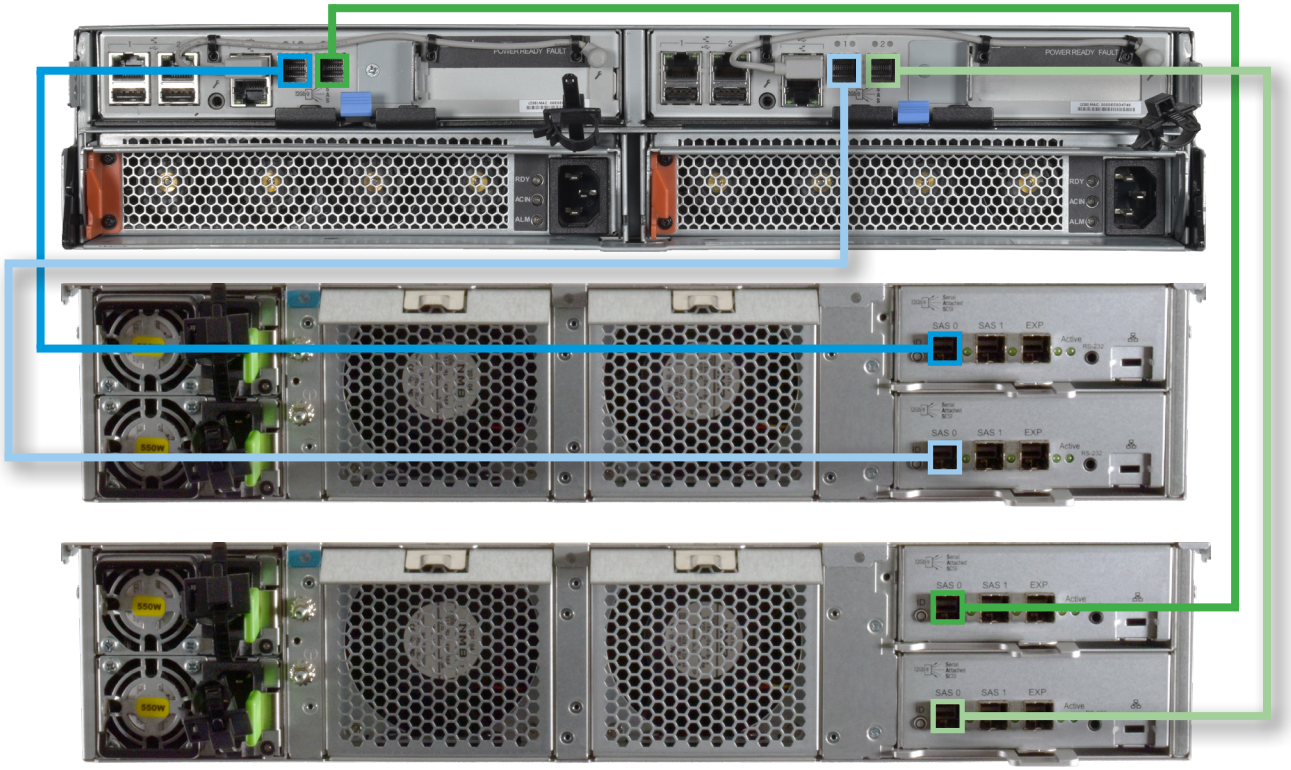
R20



R40

R50

5.2.2 X-Series



5.2.3 M-Series

6 Setting the ES24F Power Loss Mode

If power is lost to the system, the ES24F can either start automatically or remain off when power is restored. The default is set to the desired behavior when the system is purchased.

To later change the power loss mode, press the power button three times in quick succession. The power button will begin blinking. Blinking slowly means the ES24F must be started manually and blicking quickly means the system will automatically power on when power is restored.

7 Documentation

The TrueNAS Documentation Hub provides numerous articles designed to guide through configuring and using the software. It is available by clicking **Guide** in the TrueNAS web interface or going directly to https://www.truenas.com/docs/hub/.

The TrueNAS Documentation Hub also provides an online version of this Guide and documentation of other iXsystems products at https://www.truenas.com/docs/hardware/.

8 Contacting iXsystems

For assistance, please contact iX Support:

Contact Method	Contact Options
Web	https://support.ixsystems.com
Email	support@iXsystems.com
Telephone	Monday-Friday, 6:00AM to 6:00PM Pacific Standard Time: • US-only toll-free: 855-473-7449 option 2 • Local and international: 408-943-4100 option 2
Telephone	Telephone After Hours (24x7 Gold Level Support only): • US-only toll-free: 855-499-5131 • International: 408-878-3140 (International calling rates will apply)