Tbox Assembly Guide

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Manual Revision and Control

Revision Record

Date	Description	Page	Version
01/23/2013	Initial Draft		1.0
01/24/2013	Replacing a failed drive steps updated.	12	1.0

Congratulations on your purchase of Tbox, Tiger Technology's all-in-one shared storage appliance. This manual describes how to install and connect Tbox at your site - from unpacking the appliance to powering on the system.

Before proceeding, make sure that you have read carefully all instructions, paying special attention to the following symbols used in this guide:


SAFETY WARNING


IMPORTANT NOTE


TIP

You can find the most up-to-date version of this manual at the following address: http://www.tiger-technology.com/products/Tbox/docs

Product Overview

Tbox is a state of the art, high performance shared storage system that offers the simplicity of NAS and the performance characteristics of a true SAN. The compact rack-mountable appliance combines a Metadata Master and highly optimized RAID 5 storage, comprised of 16 enterprise-class drives (drive capacity depends on specific configuration), which can be accessed by Windows and/or Mac OS X client computers via 8Gb Fibre Channel, 10Gb Ethernet and/or 1Gb Ethernet.

The appliance is shipped fully configured to you. To deploy Tbox you should simply:

1. Rack-mount the appliance or install it on a table top (see "Installing Tbox" on page 8).
2. Install the drive carriers in the enclosure (see "Installing the Drives" on page 9).
3. Connect the appliance to the power source and turn it on (see "Connecting The Appliance to The Power" on page 13).
4. Connect client computers to the ports of the appliance - 8Gb FC, 10GbE and/or 1GbE, depending on the model (see "Cabling Tbox" on page 16).

Tbox Features

• 3RU, 19" rack-mount chassis with excellent anti-vibration mechanical design and thermal solution.

• RAID 5 shared storage comprised of 16 hot swappable drives (a failed RAID drive can be replaced while the system is operating and no data on the volume will be lost).

• 8Gb Fibre Channel, 10GbE and/or 1GbE ports for connecting client computers.

• Redundant power supply (a failed power module can be replaced while the system is operating).

• 4 x 80mm system cooling fan modules.

• 2 x internal 2.5" system drives (RAID 1).

• Tiger Technology software for shared storage management and diagnostics.

• ProjectStore software for advanced project collaboration.

Package Content

The package you have received weighs 47 kg and has the following dimensions:

It must contain the following:

- 1 x 3RU, 19" rack-mount chassis.
- 16 x 3.5" disks each installed in a hot-swappable drive carrier.
- 1 x 3.5" spare disk installed in a hot-swappable drive carrier for online recovery of a failed RAID disk.
- 1 x rack-mount rails kit:
  - 2 x slide rails.
  - 8 x screws for attaching the rails to the appliance.
  - 5 x screws for attaching the rails and the appliance to the rack.
- 2 x power cables.
- 1 x 1.80m network cable.
- 1 x front panel bezel.
- 1 x system restore USB flash drive.
- 1 x CD with instructions.
- 1 x Tbox reset tool (used for pressing the shut down and reset buttons)

Important: *If any of the components listed above is missing from your shipment, please contact your reseller or Tiger Technology support immediately.*

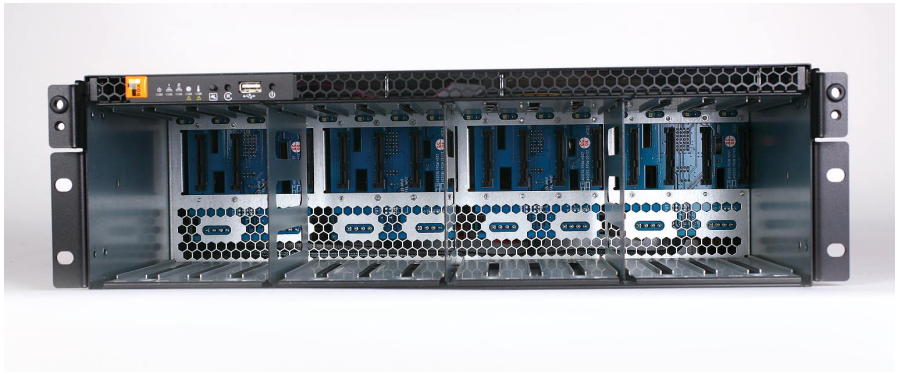
Hardware Overview

Note: *The pictures used to illustrate the product in this manual may differ from the Tbox appliance you have received depending on the model and firmware version.*

Technical Characteristics

Description	Specification
Net weight (without drives installed)	26.5 kg
Gross weight (with the RAID drives installed)	40 kg
Power Consumption Max	720 Watts
Power Consumption Idle	300 Watts
Power Supply Unit	High-efficiency 720w (1+1) Redundant Hot Swappable Power Supply W/ PFC, AC 100 ~ 240V Full Range, 50Hz ~ 60Hz
Temperature Range	Operating: 10°C ~ 20°C (50°F~77°F) Non-operating: -40°C ~ 70°C (-40°F~158°F)
Humidity Range	20% ~ 60% non-condensing

Front Panel



Apart from the 16 drive bays for the HDD carriers comprising the shared storage, Tbox's front panel features the following elements:

• LED indicators for monitoring system activity (see “Monitoring the System Activity” on page 23).

• Buttons:

alarm mute button - mutes the alarm in case of power supply failure or fan failure.

Note: *Pressing the alarm mute button only silences the alarm. The alarm light stays on until the problem is resolved.*

system reset button

system power button

Note: *To prevent you from accidentally shutting down/restarting the appliance, you can press the System power button and System reset button only using the Tbox reset tool or a similar tool.*

• USB 2.0 port - for firmware updates and system recovery

Rear View

The back of the appliance features the following elements:

• 2 x power supply modules.

• depending on the configuration you have purchased:

#808 — 8 x 8Gb Fibre Channel ports + 8 x 1Gb Ethernet ports

#428 — 4 x 8Gb Fibre Channel ports + 2 x 10 Gb Ethernet ports + 8 x 1Gb Ethernet ports

#408 — 4 x 8Gb Fibre Channel ports + 8 x 1Gb Ethernet ports

#048 — 4 x 10Gb Ethernet + 8 x 1Gb Ethernet

#008 — 8 x 1Gb Ethernet

- 1 x Ethernet port for initial setup of the appliance.
- 1 x Ethernet port for public and Internet communication.

Tbox supports the following types of cables for connection of client computers and/or switches:

SAN clients — fiber-optic or copper SFP (small form-factor pluggable) interconnect cables.

LAN clients via 10GbE — copper or fiber-optic cables with SFP+ (Small Form-factor Pluggable enhanced) connectors.

LAN clients via 1GbE — 10/100/1000 Base-T cables with RG45 connectors at each end.

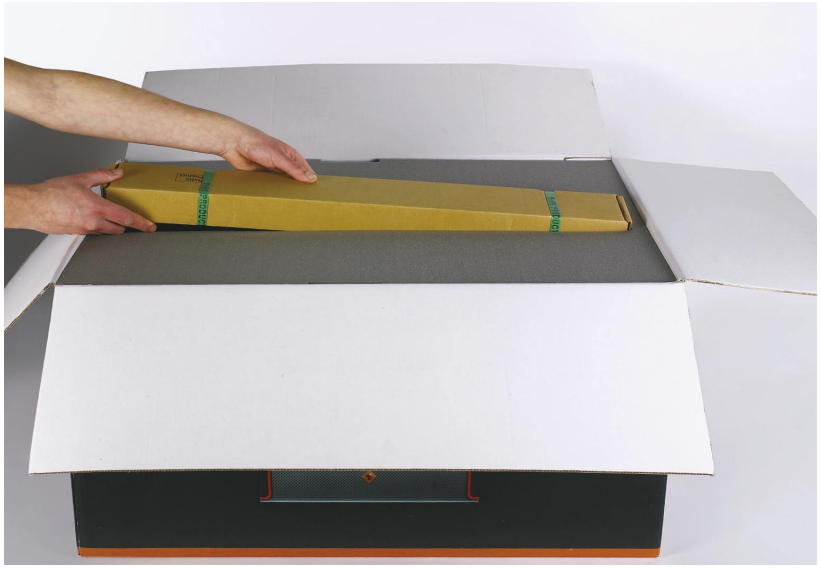
Site Installation

Unpacking Tbox

Important: *Do not throw away any of the packaging components, until you ensure that the appliance works properly and there is no need to return any part.*

1. Cut the straps of the box, cut or remove the tape and open the flaps.

2. Take out the rack-mount rails kit and then the top foam cover.

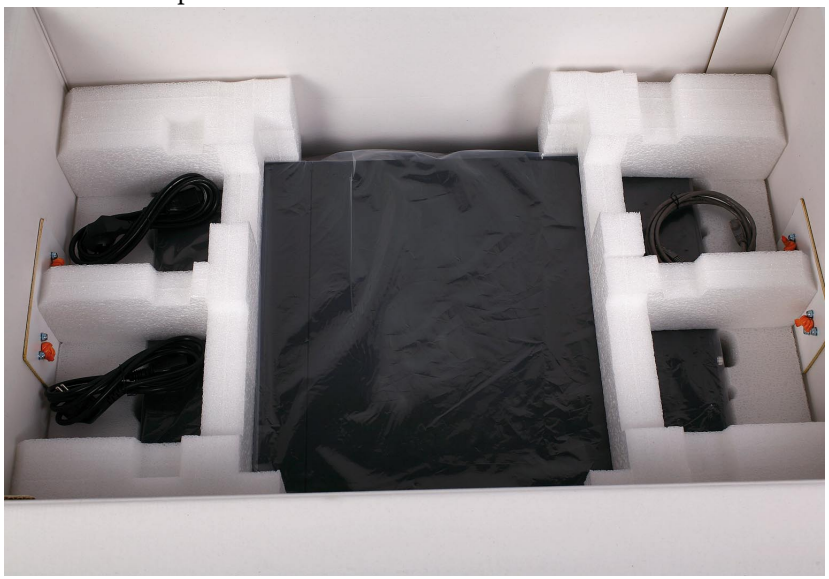


3. Take out the foam case with the front panel bezel.

4. Take out the foam case with the spare RAID drive, the Tbox System Restore USB Flash Drive and the instructions CD.

5. Take out the foam case with the sixteen RAID drives.

6. Take out the two power cables and the network cable.



7. Take out the two foam chassis protectors and with two people holding the appliance at each side, take it out of the box and place it on a surface, ensuring that the system remains stable.

Installing Tbox

Before installing Tbox in a rack or on a table top, consider the limitations for maximum cable lengths, when deciding on the location of the appliance within your facility. Also check the appliance's technical characteristics to make sure that the rack/the table meets the physical, electrical, and thermal specifications.

Rack-mounting Tbox

You can mount Tbox in a standard, 19-inch-wide, four-post video rack.

The shipping container includes a rack-mount rails kit. If you are installing Tbox in a rack, follow the instructions supplied in the rack-mount rails kit to install the appliance.

Tip: *Install the heaviest devices in the lowest position in the rack. To make the lift of Tbox easier, insert the RAID drive carriers after installing the appliance in the rack.*

Installing Tbox on a Table Top

If you do not plan to install your Tbox in a rack, and you opt for tabletop installation, ensure that:

- the surface is clean and in a safe location;
- the appliance is installed off the floor (dust that accumulates on the floor is drawn into the interior of the appliance by the cooling fans. Excessive dust inside the appliance can cause overheating and component failures);
- there must be at least 50cm (19 inches) of clearance at the front and rear of the appliance for installing and replacing the RAID drives, or accessing network cables or equipment;
- the appliance receives adequate ventilation (it is not being installed in an enclosed cabinet where ventilation is inadequate);

Installing the Drives

Tbox is shipped to you with a pre-configured RAID 5 storage, comprised of 16 disks. Each disk is installed in a hot-swappable drive carrier. You can replace a failed hard disk with the spare drive included in the shipment, while Tbox is operating and no data on the storage will be lost (see “Replacing a Failed Drive” on page 12). For safety reasons, the drives in the carriers are shipped separately and you should install them yourself in the appliance.

Important: *To prevent drive failure, in case the drives have been transported to you in cold environment (temperature less than 15°C/59°F), let the drives return to room temperature for at least 3 hours, before installing them in the enclosure.*

Each drive is labeled and must be inserted in the drive bay corresponding to its number as described in this scheme:

Tip: *If you intend to rack mount the appliance, to make the lift easier, insert the drive carriers after installing the appliance in the rack.*

Warning: *Before proceeding, make sure that the power cord is disconnected from the power source!*

Important: *To prevent electrostatic discharge (ESD), touch grounded metal before touching any of the appliance components. You can also prevent electrostatic discharge (ESD) when inserting the drive carrier into the enclosure, by holding the appliance enclosure with the other hand.*

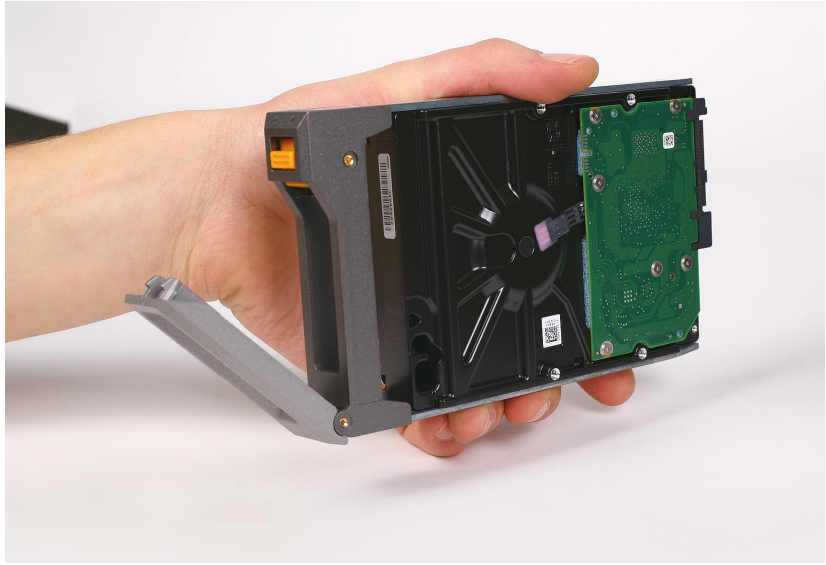
To install the drives:

1. Take out the drive carrier from the antistatic bag.

Important: *Handle the hard drive by the sides only, making sure you don't touch the printed circuit board or the connectors.*

2. Press upwards the latch release button on the front of the drive carrier.

The latch opens.



3. Find the label on the drive that specifies its corresponding drive bay.

4. Slide the drive carrier into the corresponding slot until the latch makes contact with the enclosure.

5. Push the latch up to finish sliding the drive carrier into the drive bay. To ensure that the latch is locked, you must hear a clicking sound.

6. To check that the drive carrier is properly installed and makes full contact with the drive bay, try to pull it out without unlocking the latch.

Important: *If the drive can be pulled out, repeat the steps for installing it from the beginning.*

7. Repeat the above steps for each drive in the kit.

Replacing a Failed Drive

You can replace a failed hard disk with the spare drive included in the shipment, while Tbox is operating and no data on the storage will be lost.

Important: *Periodically check the RAID status in the Storage page of Tbox's web UI. Degraded RAID status indicates that a drive has failed and needs to be replaced with the spare drive.*

To replace a failed RAID disk with the spare drive:

1. Find the failed drive - its HDD status LED indicator (the left indicator) is red.

2. Press the latch button on the front of the drive carrier to release the latch and holding the lever, gently pull out the drive carrier.

Important: *If by accident you pull out other than the failed drive, the RAID becomes offline. Insert back the healthy drive and wait until the RAID is again online. After that find the failed drive and proceed with the steps.*

3. Insert the drive carrier with the spare disk into the drive bay, following the steps on page 10.

   When the HDD status LED of the drive stops blinking, rebuild the RAID, following the steps described in the Tbox Administration Guide.

Important: *Should another RAID drive fail, the RAID will become inaccessible and data loss is possible. To prevent this, it is advisable to order a new spare drive for future use.*

Connecting The Appliance to The Power

Your Tbox is shipped to you with two power supply modules, installed in the rear of the appliance. These modules supply redundant power to Tbox - should a power supply module fail, you can replace it while the system is operating. You can replace a failed power module only with a power module of the same model.

To connect the appliance to the power supply:

1. Plug the power cord in the power socket of the power supply module.

2. Connect the power cord to the power outlet.

If the appliance is properly connected, the power module LED indicator will start blinking in green. If there's problem with the module installation, its LED indicator is blinking in red.

To replace a failed power module:

1. Find the failed power module (the light of its LED indicator is solid red).

2. Unplug its power cable from the module's socket.

3. With the finger of one hand push the side button of the power module to the right.

4. While pressing the button, pull the lever at a 90-degrees angle and slide out the unit from the appliance.

5. Insert the new power module and hear the side button click into the bay.

6. Push back the lever of the power module to lock it.

7. Plug the power cable in the module's socket.

Cabling Tbox

Before cabling Tbox it is important to carefully plan the topology of your network. Client computers can connect to Tbox as SAN clients (connected via Fibre Channel and 1/10 GbE) or LAN clients (connected via 1GbE or 10GbE). While SAN clients need the additional network connection (through a 1GbE/10GbE port) for metadata exchange with Tbox, LAN clients use only one network port for both data traffic and metadata exchange. As metadata overhead is kept to an absolute minimum, there's no need to connect each SAN client to a separate network port, but rather connect them to the Public port through an Ethernet switch and spare the remaining network ports for connecting LAN clients. You can connect client computers directly to the available FC/10GbE/1GbE ports for full bandwidth, or you can expand the number of connected clients by deploying FC/Ethernet switches. Note that in this configuration the bandwidth available to each node decreases, as additional nodes are added.

Tbox also allows you to team the ports of a single 1GbE NIC (the Ethernet switch or the client computer NIC must support link aggregation). Besides allowing a network card to be accessed through a single IP address, and sparing you the need to specify a

separate IP address for each port, port teaming also can provide more bandwidth through a single IP address.

Important: *It is advisable when planning the topology of the network, to make sure that no client computer has more than one network connection (through two or more IP addresses) to the appliance - for example, direct connection through a 10GbE port and connection through an Ethernet switch.*

Additionally, Tbox features an Admin port for connection to a computer, from which to perform the initial setup of Tbox (refer to Administering Tbox User's Guide).

To connect a computer to the Admin port:

1. Plug one end of the network cable provided in the shipment in the port with label Admin port.

2. Plug other end of the network cable in the LAN port of the computer, from which you want to perform initial connectivity setup.

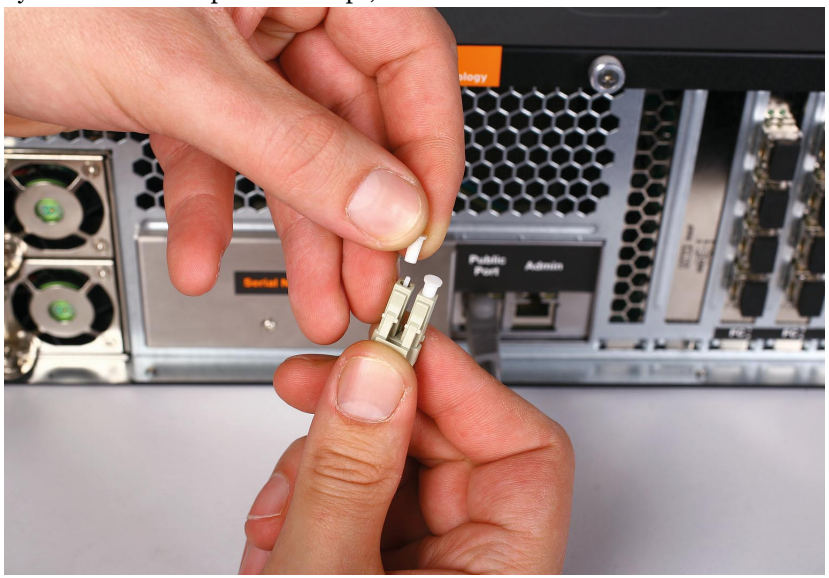
   For details about performing the initial setup of Tbox, refer to Tbox Administration Guide.

To connect a SAN computer:

Note: *Your Tbox shipment doesn't include optical fiber and copper Fibre Channel cables. The FC ports are with optical SFPs.*

1. Remove the protective black cap from the Fibre Channel port.

2. If your FC cable has protective caps, remove them.



3. Plug one end of the FC cable into the SFP socket of the appliance port.

4. Do one of the following:

- Plug other end of the FC cable in the port of the Fibre Channel card of the client computer.
- Plug other end of the FC cable in the port of the Fibre Channel switch and then connect the switch to the client computer's FC port.

Note: *If you opt for interconnection via switch, refer to your switch documentation for further setup instructions.*

5. Plug one end of the network cable into one of the available network ports of the appliance.

6. Do one of the following:

- Plug other end of the network cable in the port of the network card of the client computer.
- Plug other end of the network cable in the port of the Ethernet switch and then connect the switch to the client computer's network port.

Note: *If you opt for interconnection via switch, refer to your switch documentation for further setup instructions.*

To connect a LAN computer via 10GbE port:

Note: *Your Tbox shipment doesn't include copper and fiber-optic cables. The ports of the 10GbE cards don't feature SFP+ sockets.*

1. Plug one end of the cable into the 10GbE port of the appliance.

2. Do one of the following:

- Plug other end of the cable in the 10GbE port of the client computer.
- Plug other end of the cable in the 10GbE port of the Ethernet switch and then connect the switch to the client computer's 10GbE port.

Note: *If you opt for interconnection via switch, refer to your switch documentation for further setup instructions.*

To connect a LAN computer via 1GbE port:

Note: *Your Tbox shipment doesn't include twisted pair cables.*

1. Plug one end of the cable into the network port of the appliance.

2. Do one of the following:

- Plug other end of the cable in the network port of the client computer.
- Plug other end of the cable in the port of the Ethernet switch and then connect the switch to the client computer's network port.

Note: *If you opt for interconnection via switch, refer to your switch documentation for further setup instructions.*

Installing The Front Panel Bezel

Tbox is shipped with a bezel that covers the front panel. The bezel features an advanced protection filter that prevents dust from accumulating in the RAID drives and the enclosure. It is advisable to clean the bezel filter every 3 months.

Tip: *You can install/remove the bezel at any time without having to turn off or dismount the appliance from the rack.*

To install the bezel:

1. Insert the tabs on each end of the bezel into the flanges on each side of the appliance's front panel.

2. Screw the two thumb screws on either side clockwise.

To remove the bezel:

1. Loosen the thumb screws on either side of the bezel.

2. Gently pull away the bezel from the front panel of the appliance.

To clean the bezel filter:

1. Remove the bezel (see steps on page 21).

The filter is snapped on the inside frame of the bezel.

2. Take the filter off by hand and wash it under running water, then leave it to dry.

3. When the filter is completely dry, fit it inside the bezel by snapping its magnetic strips to the inside frame of the bezel.

4. Install the bezel (see steps on page 20).

Hardware Monitoring

Monitoring the System Activity

The LEDs on the front panel of Tbox allow you to monitor the system activity. You can monitor the system activity without removing the front panel bezel:

Indicator	LED color	Status	Description
power status LED 	green	blinking	stand by (power is on, but the system is not turned on)
		solid	power on
	red	solid	power supply error or no power
system activity LED 1 	green	solid	system is idle
	green	slow blinking (once a second)	maintenance operations running while system is idle (like disk defragmentation, for example)
	green	fast blinking (more than 4 times a second)	system is busy
network activity LED 2 	amber	blinking	online
	-	-	offline or no transaction
fan failure LED 	red	blinking	error or fan failure
	-	-	OK
overheat LED 	red	blinking	HDD temperature over 55°C
	-	-	OK

Monitoring RAID Drives Activity

You can monitor the activity of the RAID drives using the LED indicators on the top of each HDD carrier:

Indicator	LED color	Status	Description
HDD power (right indicator)	blue	solid	HDD power on
	-	-	HDD power off
HDD status (left indicator)	green	blinking	transmitting data
	green	solid	(SAS disks) idle state
	red	solid	HDD failure or error
	-	-	(SATA disks) idle state

Important: *To diagnose RAID drive failure it is advisable to regularly check the RAID status in the Storage page of Tbox's web UI (see Tbox Administration Guide). Degraded RAID status indicates that a drive has failed and needs to be replaced with the spare drive, following the steps described in "Replacing a Failed Drive" on page 12.*

Monitoring Client Connectivity

You can monitor the connectivity of SAN/LAN clients using the LED indicators on the FC/10GbE/1GbE ports respectively.

FC ports

Tbox FC cards are set up to work in auto mode i.e. their ports transmit data depending on the connectivity mode of the client's (or the switch's) FC card - 2GB, 4GB or 8GB. You can view the transmission mode through any FC port using the LED indicators above it. If the FC port LED's light is off the port is inactive.

Indicator	LED color	Status	Description
left	green	solid	2Gb mode
right	green	solid	4Gb mode
both	green	solid	8Gb mode

10 GbE Ports

You can view the status of your connection through a 10GbE port using the LED indicator above it.

Indicator	LED color	Status	Description
activity LED (left indicator)	green	blinking	The adapter is sending or receiving network data at up to 10Gbps.
	-	-	No network activity on the link.
link LED (right indicator)	amber	solid or blinking	The 10GbE LAN card is initialized.
	-	-	The adapter is not receiving power or the 10GbE LAN card is not initialized.

1 GbE Ports

You can view the status of your connection through an 1 GbE port using the LED indicators above it.

Indicator	LED color	Status	Description
speed LED (left indicator)	amber	solid	Operating as a Gigabit connection (1000 Mbps).
	green	solid	Operating as a 100-Mbps connection.
	-	-	Operating as a 10-Mbps connection.
link LED (right indicator)	green	blinking	There is activity on this port.
	-	-	No link is established.

Monitoring Power Supply

You can monitor the activity of the power modules using their LED indicator:

Indicator	LED color	Status	Description
power module	green	blinking	system is in stand by mode
	red	blinking	no power
		solid	power module failure