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Tiger Box Expansion Chassis Assembly Guide

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Congratulations on your purchase of Tiger Box Expansion Chassis, the easiest way to expand the storage capacity of your Tiger Box/Tiger Box1 all-in-one shared storage appliance. This manual describes how to install and connect the expansion chassis at your site - from unpacking the appliance and connecting it to Tiger Box/Tiger Box1 to powering it on.

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/tiger-series/tiger-box/docs

Product Overview

Tiger Box Expansion Chassis is a natural addition to Tiger Technology's all-in-one shared storage appliance, allowing you to easily expand the storage capacity of your Tiger Box/Tiger Box1. It features the same physical characteristics as Tiger Box and is comprised of 16 enterprise-class drives (drive capacity depends on specific configuration). When connected to Tiger Box/Tiger Box1, the drives appear to all Windows, Mac OS X and Linux clients as a separate RAID 5 volume. Utilizing the smart storage pooling feature of Tiger Box 2.0 software, you can unite the main chassis volume and the volume(s) of all connected expansion chassis into a single virtual volume - the storage pool - that users can access through a universal mount point. The pool size equals the sum of the capacity of all volumes that comprise it and presents their existing folder structures as one merged folder structure. For more details, refer to Tiger Box 2.x Administration Guide.

The expansion chassis is shipped fully configured to you. To deploy it you should simply:

1. Rack-mount the expansion chassis or install it on a table top (see "Installing The Expansion Chassis" on page 8).

2. Install the drive carriers in the enclosure (see "Installing the Drives" on page 9).

3. Connect the expansion chassis to the main storage (see "Connecting The Expansion Chassis to Tiger Box/Tiger Box1" on page 13)

4. Connect the expansion chassis to the power source and turn it on (see "Connecting The Expansion Chassis to The Power" on page 14).

Tiger Box Expansion Chassis 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).

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

• 4 x 80mm system cooling fan modules.

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.

• (*optional*) 1 x 3.5" spare disk installed in a hot-swappable drive carrier for online recovery of a failed RAID disk.

• 1 x square-hole rack-mount rails kit:

  • 2 x slide rails.

  • 6 x screws for attaching the rails to the appliance.

  • 4 x screws for attaching the rails and the appliance to the rack.

• 2 x power cables.

• 1 x SFF-8088 SAS cable.

• 1 x front panel bezel.

• 1 x CD with instructions.

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

⚠️ **Important:** *Check if both warranty stickers at the back of the chassis are intact. If a warranty sticker is damaged, immediately contact Tiger Technology at support@tiger.technology.com.*

Hardware Overview

Note: *The pictures used to illustrate the product in this manual may differ from the Tiger Box Expansion Chassis you have received depending on the model.*

Technical Characteristics

Description	Specification
Net weight (without drives installed)	approx. 26kg/58lbs
Gross weight (with RAID drives installed)	approx. 40kg/88lbs
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: 10ºC ~ 20ºC (50ºF~77ºF) Non-operating: -40ºC ~ 70ºC (-40ºF~158ºF)
Humidity Range	20% ~ 60% non-condensing

Front View

Apart from the 16 drive bays for the HDD carriers comprising the expansion storage, the front of the expansion chassis' features the following elements:

• LED indicators for monitoring system status (see "Monitoring the System Activity" on page 15).

• ⬚ 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.*

Rear View

The back of the expansion chassis features the following elements:

• 2 x power supply modules.

• 1 x input SAS port, for connecting the expansion chassis to Tiger Box/Tiger Box1.

• 1 x output SAS port, for connecting another expansion chassis to the current one.

Site Installation

Unpacking The Expansion Chassis

> ⚠️ **Important:** *Do not throw away any of the packaging components, until you ensure that the expansion chassis 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 (in case your order includes one) and the instructions CD.

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

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

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

⚠️ **Important:** *Tiger Box Expansion Chassis weighs approximately 26.5 kg. Attempting to move it without assistance could cause personal injury. Request assistance and use proper lifting techniques when lifting the appliance.*

Installing The Expansion Chassis

The same physical, electrical, and thermal requirements are valid for the Tiger Box expansion chassis as for Tiger Box (refer to Tiger Box Assembly Manual for more information). You should also consider the SAS cable length limitation - the one provided in the shipment is 37cm long, to install the expansion chassis at a greater distance from the main Tiger Box/Tiger Box1 appliance, you should use a longer SAS cable.

Rack-mounting The Expansion Chassis

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

A square-hole rack-mount rails kit is included in your shipping. If you are installing the expansion chassis 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 the expansion chassis easier, insert the RAID drive carriers after installing the appliance in the rack.*

Installing The Expansion Chassis on a Table Top

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

• the surface is clean and in a safe location;

• the expansion chassis 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 chassis for installing and replacing the RAID drives, or accessing equipment;

• the expansion chassis receives adequate ventilation (it is not being installed in an enclosed cabinet where ventilation is scarce);

Installing the Drives

The expansion chassis 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, while the expansion chassis is operating and no data on the storage will be lost (see "Replacing a Failed Drive" on page 18). 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 expansion chassis, 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 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.
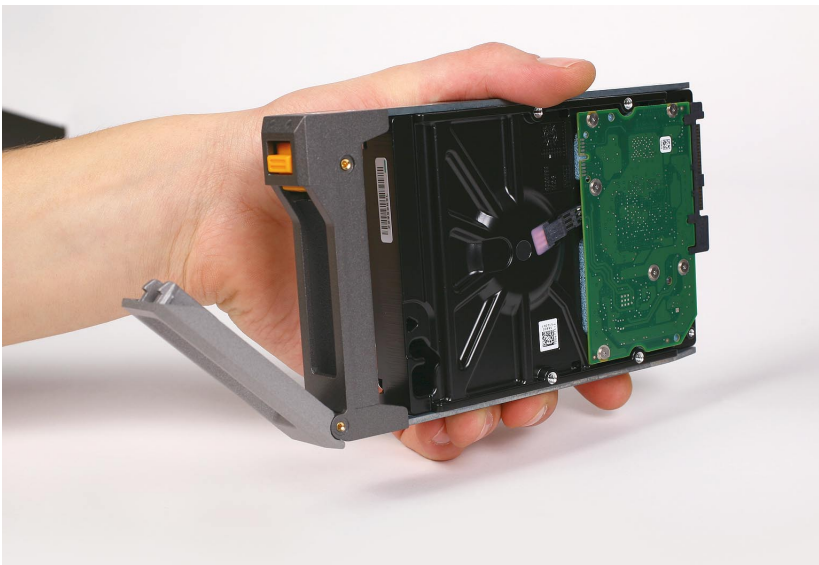
3. Find the label on the drive that specifies its corresponding drive bay.

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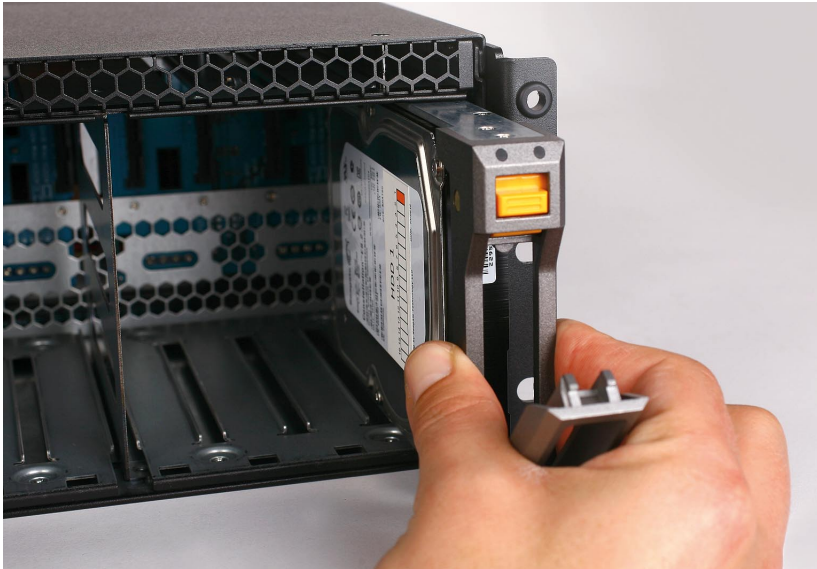
7. Repeat the above steps for each drive in the kit.

Installing The Front Panel Bezel

The expansion chassis 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 expansion chassis 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 expansion chassis' front panel.

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

Connecting The Expansion Chassis to Tiger Box/ Tiger Box1

To make the expansion chassis' storage available to client computers, you should first connect it to the main Tiger Box/Tiger Box1 storage via the SAS cable provided in the shipment. You can directly connect up to two expansion chassis to Tiger Box and just one expansion chassis to Tiger Box1.

To connect the expansion chassis to Tiger Box/Tiger Box1:

1. Plug one end of the SAS cable in the Input SAS port at the back of the expansion chassis.

2. Plug the other end of the SAS cable in the available SAS ports on Tiger Box/Tiger Box1.


Should you decide to connect more expansion chassis (more than two with Tiger Box or more than one with Tiger Box1), you should plug the other end of the SAS cable in the Output port of one of the already connected expansion chassis.

Connecting The Expansion Chassis to The Power

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

To connect the expansion chassis to the power supply:

1. Plug the power cord in the power socket of the power supply module.
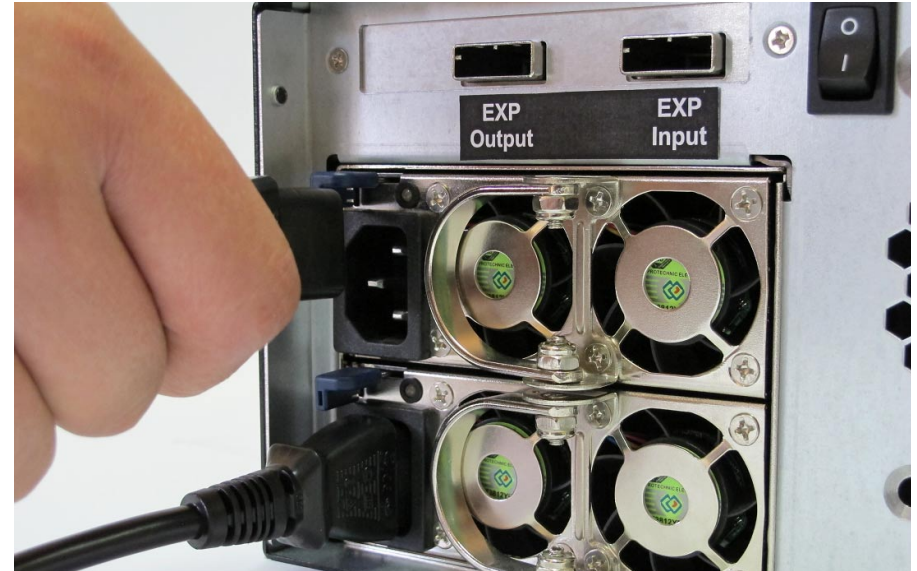
2. Connect the power cord to the power outlet.

If the expansion chassis 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.

Powering On The Expansion Chassis

Once you have deployed the expansion chassis, you are ready to power it on. If the Tiger Box/Tiger Box1 appliance to which it is connected is also turned on, the expansion chassis RAID becomes immediately available in the web interface of Tiger

Box and can be accessed by connected client computers. To turn on or off the expansion chassis you can use the switch at the back of the appliance.

To power on the expansion chassis:

Turn the switch at the back of the appliance to the ON position.

The power status LED at the front must become solid green.

To power off the expansion chassis:

Turn the switch at the back of the appliance to the OFF position.

Hardware Monitoring

Monitoring the System Activity

The LEDs on the front panel of the expansion chassis 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
fan failure LED	red	blinking	error or fan failure
	-	-	OK
overheat LED	red	blinking	system overheating
	-	-	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 Management page of Tiger Box's web UI (see Tiger Box 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 18.*

Monitoring The Power Supply

You can monitor the activity of the power modules using their LED indicator:
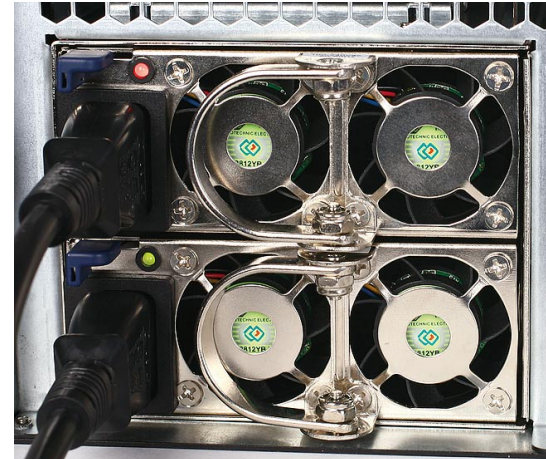
Indicator	LED color	Status	Description
power module	green	blinking	system is in stand by mode
	red	blinking	no power
		solid	power module failure

Post Installation Maintenance

Removing the Bezel and Cleaning the Filter

You should remove the front panel bezel to mute the alarm in case of power supply failure or fan failure, and also when replacing a failed RAID drive. You can remove and install the bezel at any time without having to turn off or dismount the appliance from the rack.

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.

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 expansion chassis.

To clean the bezel filter:

1. Remove the bezel (see steps on page 17).

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 12).

Replacing a Failed Drive

You can replace a failed hard disk, while Tiger Box/Tiger Box1 is operating and no data on the storage will be lost. If your order includes a spare drive, it is shipped to you pre-installed in a drive carrier and is ready to replace the one that has failed.

You can also replace a failed drive with a drive not included in your shipment. In this case the new drive must be exactly the same size and make as the one that has failed. Additionally, you should uninstall the failed drive from its drive carrier and then install the replacement drive in the carrier.

⚠️ **Important:** *Periodically check the RAID status in the Storage page of Tiger Box's web UI. Degraded RAID status indicates that a drive has failed and needs to be replaced. If more than one RAID drive fails, the RAID will become inaccessible and data loss is possible.*

To replace a failed RAID disk with the spare drive:

1. Remove the front panel bezel (see page 17).

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 9.

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

⚠️ **Important:** *Make sure you order an additional spare drive in case another RAID drive fails in the future.*

Replacing a Failed Power Module

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

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.
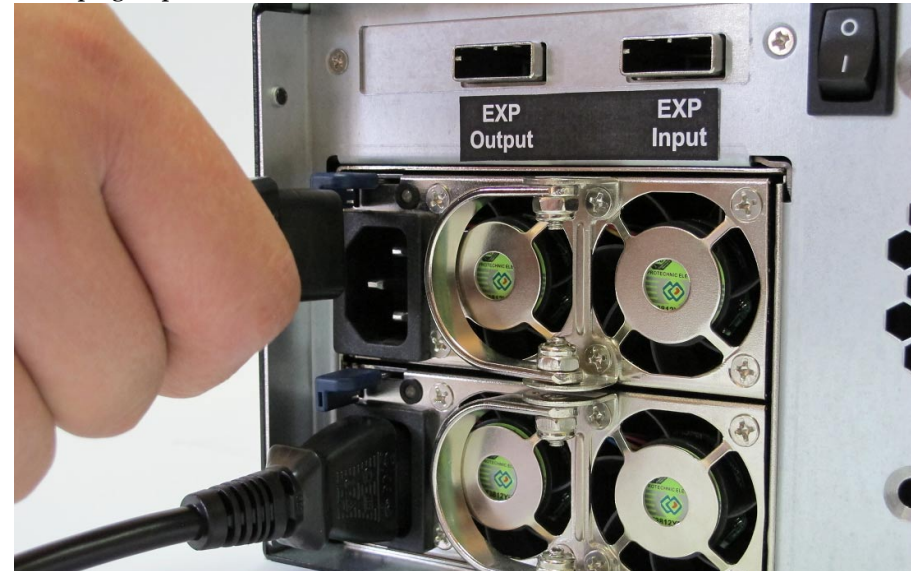
3. With the finger of one hand push the side button of the power module to the right.
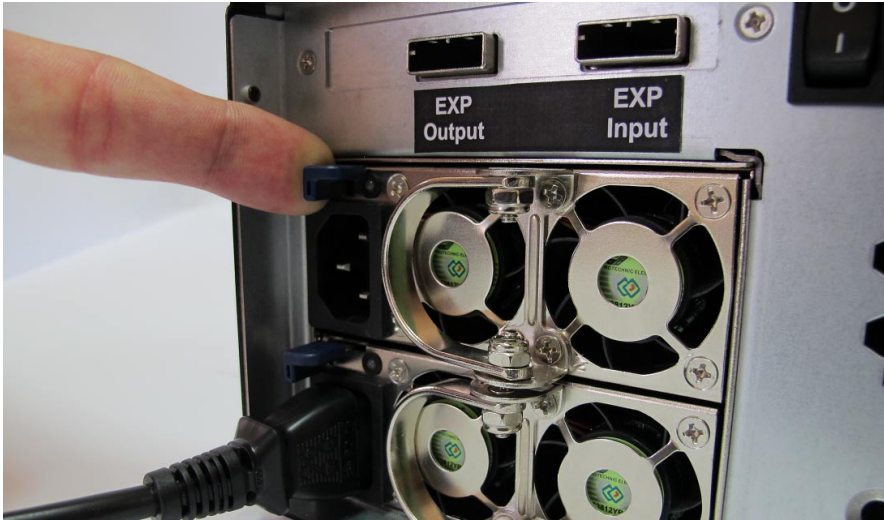
4. While pressing the button, pull the lever at a 90-degrees angle and slide out the unit from the appliance.

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.