Zebra Supersight™

Installation and Hardware Reference

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Chapter

1

Before you begin

This chapter introduces you to the key features of your Zebra Supersight unit.

Overview

A Zebra Supersight unit is a high-performance computing (HPC) platform that allows the connection of Zebra Supersight SHB-Q370 system Host board(s) (SHBs), GPU boards (display boards), I/O boards, frame grabber boards, and processing boards in one chassis. All these boards are connected to a PCIe switched fabric backplane; this allows the Zebra Supersight and its associated boards to communicate with each other on their own network.
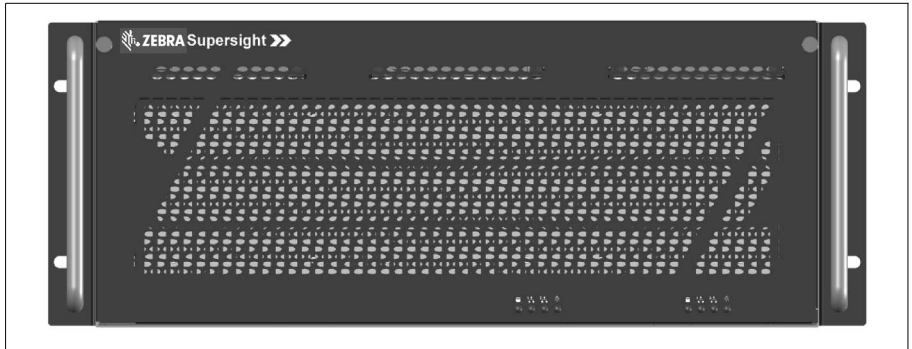
Each Zebra Supersight SHB-Q370 in the unit acts as a separate computer with its own UEFI, operating system, memory, hard disk drives, USB connectors, network connectors, and add-on boards. The selected configuration file establishes which add-on boards an SHB controls. Each SHB must be connected to one or more hard disk drives (or other type of mass storage device).

The Zebra Supersight unit is also rack mount capable and includes mounting holes to securely attach your unit to a rack mount. Stainless steel handles are found at the front of the Zebra Supersight unit to help remove it from the rack mount.

Types of units

There are three types of Zebra Supersight units available. They differ as follows:

- Zebra Supersight Solo can only have 1 SHB.

- Zebra Supersight Duo can have 2 SHBs.

- Zebra Supersight Quad can have up to 4 SHBs.

Zebra Supersight units come pre-installed with a backplane, one Zebra Supersight SHB-Q370 with memory modules, a mass storage device, a power supply, and three cooling fans; these are encased within a metal chassis. Microsoft Windows 10 IoT Enterprise 2019 comes preinstalled on the mass storage device.

Documentation conventions

The following conventions are used in this manual.

Node

A *node* consists of one Zebra Supersight SHB-Q370, along with any additional boards that are connected to the SHB through the backplane, such as GPU boards, boards with FPGAs, frame grabber boards, and processing boards.

Naming convention

This manual refers to Zebra Supersight Solo, Zebra Supersight Duo, and Zebra Supersight Quad units with Zebra Supersight SHB-Q370, all as *Zebra Supersight.* When necessary, their full names are used.

This manual refers to Zebra Supersight SHB-Q370 as an SHB (system Host board).

Backplane

The Zebra Supersight backplane is a switched fabric backplane. A switched fabric backplane allows one SHB to communicate, without additional connectors, with the PCIe 3.0 boards connected to the same backplane and belonging to the same node. Communication with SHB and PCIe boards of different nodes occurs below the operating system level, and can be accessed by programs like a Distributed MIL application. Note that, since this communication occurs below the operating system level, no Ethernet network connection is required. All PCIe slots provide a mechanical x16 connection, but these might be limited to x8 or x4, depending on the SHB and the PCIe boards installed, where they are installed, and the selected configuration file.

One Zebra Supersight
SHB-Q370 in a
Zebra Supersight Solo

SHB
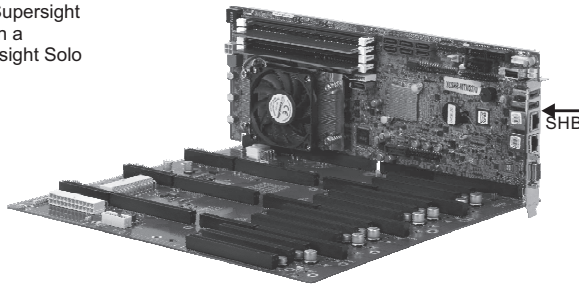
Two Zebra Supersight
SHB-Q370 in a
Zebra Supersight Duo
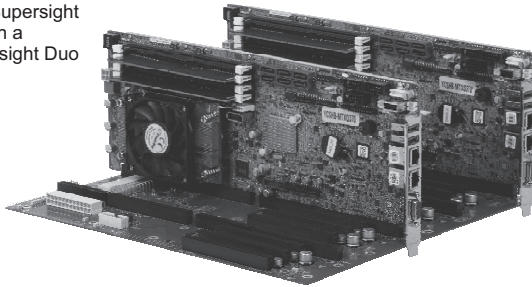
Four Zebra Supersight
SHB-Q370 in a
Zebra Supersight Quad
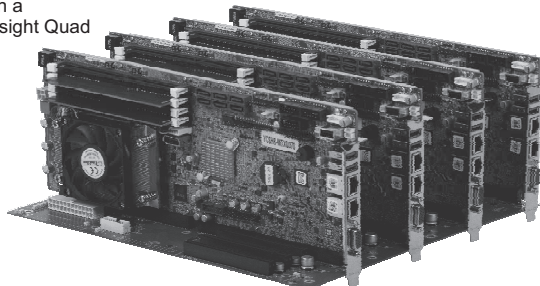
The Zebra Supersight backplane can accommodate the following hardware:

Hardware differences	Zebra Supersight Quad	Zebra Supersight Duo	Zebra Supersight Solo
Number of PICMG 1.3 SHB connectors	4	2	1
Max number of PCIe boards that can be connected if all SHBs are installed[*]	8	10	11

*.   Although all PCIe connectors are mechanically x16, the actual lane width of each slot depends on the boards installed, where they are installed, and the selected configuration file.

The following diagram illustrates the backplane and how the SHB connectors and PCIe connectors are interfaced with the single PCIe 3.0 switch.

SHB
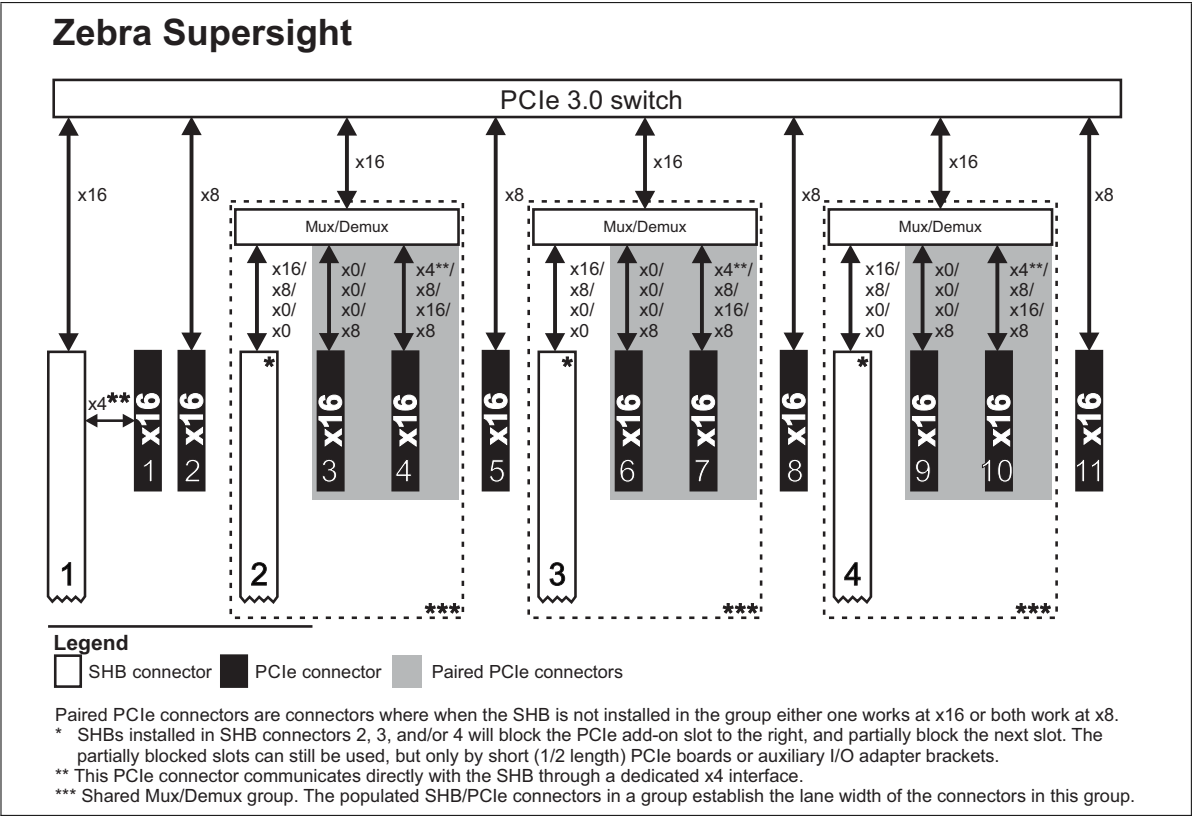
The Zebra Supersight SHB-Q370 board complies with the PICMG 1.3 specification, implementing one PCIe 3.0 x16 and one PCIe 3.0 x4 interface. The board intergrates the following functionality:

- **Processing**. Processing comes from one Intel i7-8700 processor. This processor uses technologies designed to accelerate multimedia and imaging applications. The processor uses multimedia extension (MMX) technology, streaming SIMD extensions (SSE, SSE2, SSE3, SSSE3, and SSE4) technology, and EM64T (Intel 64 architecture) technology. These technologies are extensions to the Intel architecture, which address the key characteristics of applications that must handle large amounts of image, video, and graphics data.

- **Display**. Display capabilities come from an integrated graphics controller. The graphics controller allows you to send analog video data to a high-resolution analog display device using the VGA connector (external) and digital video data to a high-resolution digital display device using the DisplayPort connector (found internally on the SHB Q370 board and not available on the SHB bracket). The use of this interface can be made available through an extension or cable adapter, such as a passive DP-to-DP extension or a DP-to DVI active adapter. The maximum display resolution for the VGA connector is 1920 x 1200 @ 60 Hz; the maximum display resolution for the DisplayPort connector is 4096 x 2304 @ 60 Hz[1].

- **Memory**. Memory comes from the Long-DIMM memory modules installed in the four DDR4 288-pin Long-DIMM slots on the SHB; each slot supports a Long-DIMM memory module up to 16 Gbytes in size. The DDR4 modules run at up to 2666 Mbps (DDR4-2133). The total amount of memory can be 64 Gbytes.

- **Mass storage**. Mass storage comes from a 2.5-inch SATA hard disk drive, connected to the SHB. The SHB must be connected to a mass storage device containing its operating system; without it, the SHB cannot boot.

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1. If using a cable extension, the maximum cable length that you can use will be impacted.

- **Networking**. Networking comes from the two integrated Gbit Ethernet interfaces. Each Gbit Ethernet interface supports Fast Ethernet (100BaseT) or Gigabit Ethernet (1000BaseT).

- **UEFI**. The UEFI[1] is stored on an on-board flash memory device. The UEFI acts as an interface between the operating system and the Zebra Supersight SHB-Q370 board.

  The installation of a Zebra Supersight SHB-Q370 board blocks one PCIe slot and partially blocks two other slots. These partially blocked slots can still be used, but only by short (1/2 length) PCIe boards or auxiliary I/O adapter brackets.

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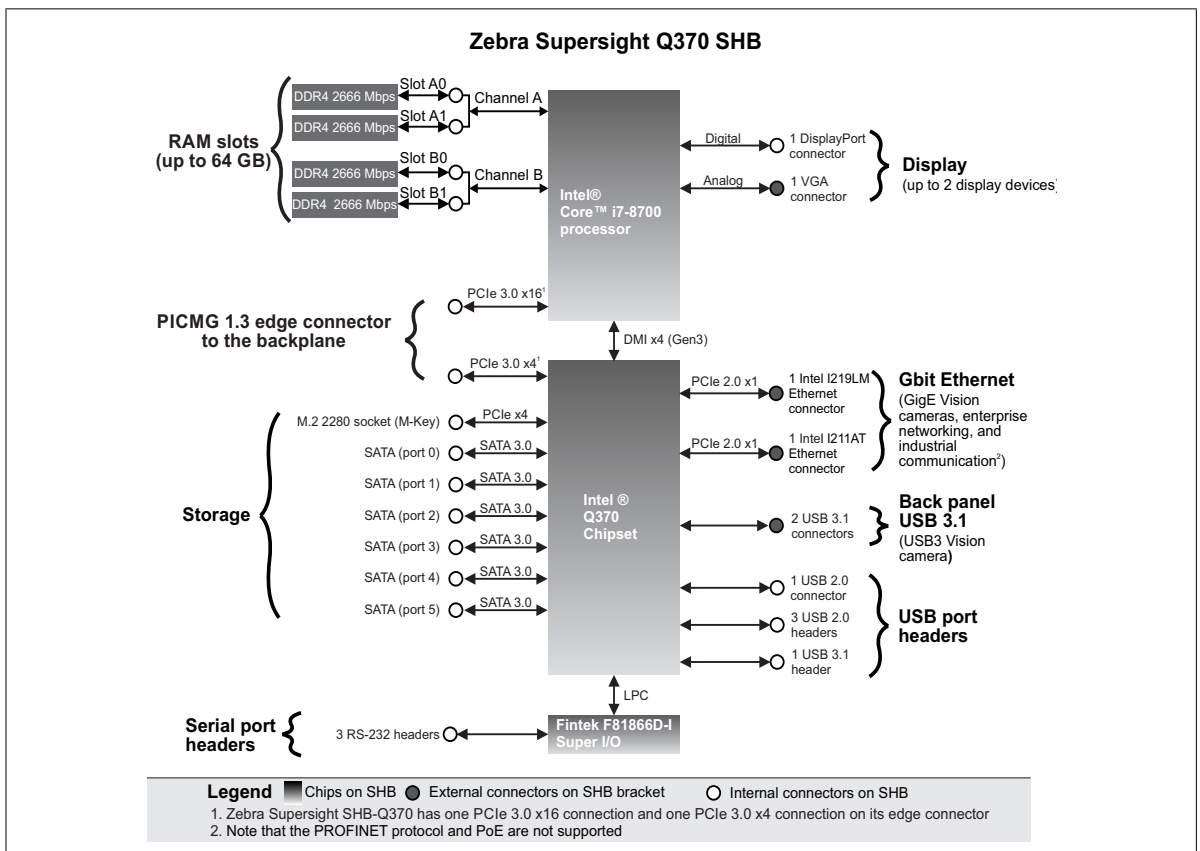
1. On legacy computers, this was referred to as a BIOS, and in some menu items, BIOS and UEFI are still used interchangeably.

Operating system

The Zebra Supersight unit comes pre-installed with Microsoft Windows 10 IoT Enterprise 2019 (64-bit version).

Zebra Technologies designed the Zebra Supersight unit for a specific use (such as, creating and installing software to process images). You may only use the operating system and associated software on the unit for that use.

You may use other programs with the operating system as long as the other programs:

- Directly support the manufacturer's specific use for the device, or

- Provide system utilities, resource management, or anti-virus or similar protection.

Software that provides consumer or business tasks or processes might not run on the device. This includes email, word processing, spreadsheet, database, scheduling, and personal finance software. The device can use Remote Desktop Services to access such software running on a server.

Inspecting the Zebra Supersight package

You should check the contents of your Zebra Supersight package when you first receive it. If something is missing or damaged, contact your Zebra representative.

Standard components

The following components are included with your Zebra Supersight unit:

Standard package item	Details

A Zebra Supersight unit	Includes the following components pre-installed in a metal chassis:
	• A switched-fabric backplane.
	• Three cooling fans and a power supply.
	• One to four SHBs, depending on which unit you purchased.
	• Each SHB comes with:
	  - Two 8 Gbyte[*] memory modules.
	  - At least a 500 Gbyte[*] mass storage device with connection and power cable, pre-installed with Microsoft Windows 10 IoT Enterprise 2019 for Embedded Systems, 64-bit.

Additional parts[†]	• One retainer bar and a bag of retainer clips (used to secure the SHB(s) to the unit).
Zebra Supersight software package	Includes the following: • An operating system license. • Drivers and utilities (such as the Zebra Supersight Configuration utility). These are pre-installed, but if you require their installation files, contact your Zebra representative.
Safety notice with URL to the Zebra Supersight installation and hardware reference	A sheet that includes warning symbols and a URL that directs you to the Zebra website to download this manual.

[*]. The exact amount of storage and memory available might change over time. Contact your Zebra representative for more details. The number of hard disk drives installed in the chassis is determined by your order and the number of Zebra Supersight SHBs installed.

[†]. Be aware that the additional parts that come with your chassis might change over time, and might vary depending on the model of Zebra Supersight that you have purchased.

Optional components

You might have also purchased any of the following optional Zebra components to complete the unit. These will not come pre-installed.

Additional component	Details
Add-on boards	You can install PCIe boards. For third-party GPU boards, contact your Zebra sales representative for the list of pre-qualified vendors.
USB adapter bracket	This bracket allows you to use the internal USB headers of the SHBs with USB connectors from outside of the chassis.
DisplayPort extension bracket	This extension allows you to access the DisplayPort connector on the SHB from outside the unit, without needing to open the chassis cover.
Serial port adapter bracket with two DE-9 connectors	This bracket allows you to access the internal serial port headers of the SHBs with DE-9 connectors from outside of the chassis.
DVI-D adapter bracket	This bracket allows you to access the internal DisplayPort connector of the SHBs with DVI-D connectors from outside of the chassis.

❖ Note that to order these items separately, contact your Zebra sales representative.

General warnings and key to the symbol on the unit

You should be aware of the meaning of the symbol on the unit and important usage and handling precautions.

Zebra Supersight safety precautions and key to the symbol

Before installing, connecting to, and using Zebra Supersight, you shall be aware of the meaning of the symbol on the unit and important safety precautions. The following is a precautionary symbol found on the unit and its meaning:

Symbol[*]	Description
	• Caution: Consult this manual[†] before installing, connecting to, and using Zebra Supersight. For hardware installation instructions, refer to *Chapter 2: Getting started with your Zebra Supersight* and *Chapter 3: Cleaning the air filter and connecting devices to the backplane and SHB board*; for environmental and electrical specifications and connector pinout descriptions, refer to *Appendix B: Technical reference*. This product shall be used as specified; otherwise, the protection provided by its components might be compromised. • Refer to the *Electrical specifications* section, in *Appendix B: Technical reference*, for voltages and current ratings. • To service the equipment, always turn off the unit and disconnect the main AC power before opening the unit. Always secure the equipment and close the chassis before reconnecting the main AC power. • This product meets the requirements of a Category I installation as per industry standards[‡]. • This product is designed for use in a pollution degree 2 environment as per industry standards[‡]. • This product is designed for indoor use only. • This product is designed to operate at temperatures ranging from 0°C to 35°C at a non-condensing relative humidity of 10 to 90%. • This product is not intended for use at altitudes exceeding 2000 m.

*.   Note that this symbol might not necessarily be the same color as depicted.

†.   Manual available on the Zebra website at www.zebra.com/us/en/products/industrial-machine-vision-fixed-scanners.html.

‡.   As per CAN/CSA C22.2 No. 62368-1-14; UL 62368-1 (2014); CAN/CSA C22.2 No 60950-1-07 + Am1:2011 + Am2:2014; ANSI/UL 60950-1-2014; IEC 62368-1 (Edition 2.0); IEC 60950-1:2005 (Second Edition) + Am1:2009 + Am2:2013.

Handling precautions

The Zebra Supersight unit and its components are sensitive to static electricity and surges. To avoid damaging the unit, follow these precautions.

- Be sure to *turn off* the power to the unit and all peripherals, and disconnect all power cords, before adding or removing devices (for example, before removing or adding boards).

- Do not touch the heat sinks while the unit is operating; they might be very hot.

- Drain static electricity from your body by touching a metal fixture (or ground) before touching the unit.

- Wear a grounded wrist strap designed to prevent static discharge.

- Avoid letting your clothing come in contact with the unit.

- Your Zebra Supersight is not designed to be placed on its side (vertically). Doing so will obstruct venting.

Manual overview

This installation and hardware reference explains how to setup the unit and connect peripheral and internal devices.

This manual contains the following information:

- *Chapter 1: Before you begin* introduces you to the key features of your Zebra Supersight unit.

- *Chapter 2: Getting started with your Zebra Supersight* details how to connect various peripherals to the front and back panels of the Zebra Supersight unit.

- *Chapter 3: Cleaning the air filter and connecting devices to the backplane and SHB board* details how to add an SHB and other devices to the backplane (using internal connectors).

- *Chapter 4: Power management and temperature control* provides information regarding advanced configuration and power interface (ACPI) technology and Enhanced Intel SpeedStep technology (EIST).

- The appendices include a technical reference and a glossary.

Need help?

If you experience problems during installation or while using this product, you can refer to the support page on the Zebra website: supportcommunity.zebra.com/s/contactsupport?brand=matrox. The support page provides information on how to contact technical support.

To request support, you should first complete and submit the online Technical Support Request Form, accessible from the above-mentioned web page. Once you have submitted the information, a Zebra support agent will contact you shortly thereafter by email or phone, depending on the problem.

Vision Academy

Zebra provides the Vision Academy online training resource to help customers visualize the steps involved in using various products. For access to these videos, visit the Zebra website.

Chapter

2

Getting started with your Zebra Supersight

This chapter explains how to operate your Zebra Supersight, including how to add devices to the front and back panels of the unit.

Overview

Zebra Supersight comes with SHBs pre-installed in the unit. The number of SHBs included depends on the version of Zebra Supersight that you purchased. The SHBs installed feature Gbit Ethernet, analog video output (desktop output), and USB 3.0 connectors on their bracket. The front panel of the Zebra Supersight chassis also includes USB 2.0 connectors that connect to headers on the first SHB. There are also internal connectors and headers found on the SHBs for connecting to digital video outputs, USB 3.1, and USB 2.0 devices. Typically, you connect your USB3 Vision cameras to the USB 3.1 connectors because they support speeds of up to 5 Gbps.

❖ Note that the internal connectors require the installation of a bracket to be accessible from outside of the chassis; some adapter brackets are available from Zebra (for example, a USB 3.0 adapter bracket). For installation information, see *Connecting devices to the internal connectors of the SHB* section, in *Chapter 3: Cleaning the air filter and connecting devices to the backplane and SHB board*.

There might be additional external connectors on the back panel of your unit, if there are additional Zebra or third-party boards installed in your unit. See the documentation that is included with each board for more information.

The image below outlines the external connectors found at the front and back of the Zebra Supersight unit. Be aware that your Zebra Supersight is not designed to be placed on its side (vertically). Doing so will obstruct venting.

External connectors

Front panel

Two USB 2.0 connectors (connected SHB1)

Power button 2 (disconnected*)

Two USB 2.0 connectors (connected to SHB1)

Power button 1 (connected to SHB1)

Back panel

Two USB 3.1 connectors

Two Gbit Ethernet connectors

One analog video output connector

Zebra Supersight SHB-Q370 bracket

* Contact Zebra technical support for assistant with connecting this button

❖ Note that earlier versions of the chassis only had one set of power/reset buttons and USB connector pairs.

Accessing your Zebra Supersight

The following is a list of ways to access your Zebra Supersight SHB:

- **Use a keyboard, mouse, and display device**. To interact with one SHB, connect your keyboard to one of its USB connectors, and your mouse to the other. Then, connect your display device to its video output connector. Repeat this process for each SHB in your Zebra Supersight unit.

- **Use a KVM switch**. To interact with more than one SHB, you can use a KVM switch. A KVM switch allows you to switch control between more than one SHB with only a single keyboard, display device, and mouse. Connect one of the USB connectors and the video output connector from each of your unit's SHB boards to your KVM switch.

- **Use a remote connection from your development computer to one (or more) SHB**. To remotely connect to an SHB, first use a keyboard, mouse, and display device to interact with the required SHB. Configure your SHBs to be on the same IP subnet as your development computer. Connect the Ethernet connector of your SHB to your network. Follow the guidelines in Microsoft help to enable remote connections. Then, attach the mouse, keyboard, and display device to your next SHB and repeat the process. Once each SHB is configured and connected, you can use the remote connection utility to remotely control the required SHB from your development computer.

- **Use an SHB to remotely connect to other SHBs.** A virtual NIC is available on each SHB for inter-SHB TCP/IP communication through the backplane.

Starting and turning off the Zebra Supersight unit

After connecting a power cable to the 1 KW power supply at the back of the Zebra Supersight, you can start your unit. By default, pressing the Zebra Supersight unit's power button 1 will start all the SHBs in the chassis.

❖ Note that earlier versions of the chassis only had one set of power/reset buttons and USB connector pairs.
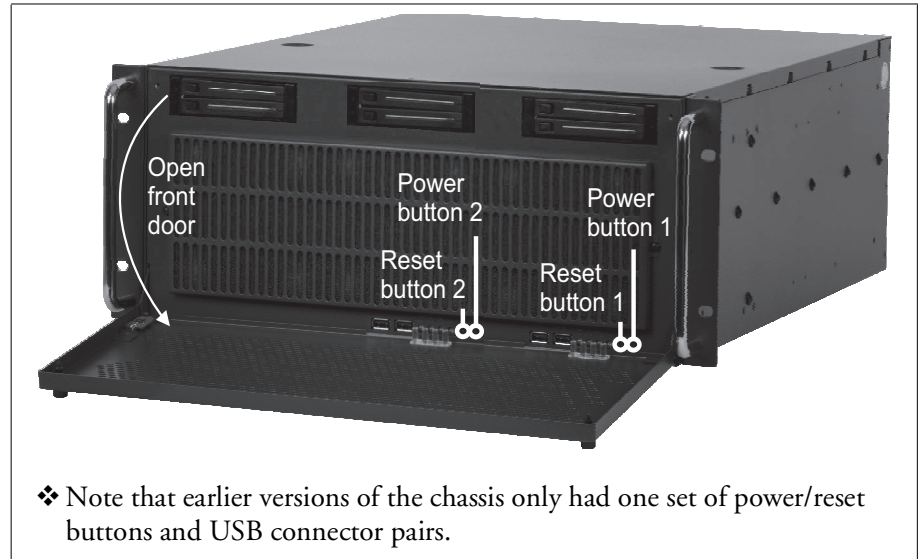
Limited automatic logins and default passwords

If you have not changed the user name and password for the administrator account, your Zebra Supersight unit will use this information to automatically log into your operating system. However, after five consecutive automatic logins with this password, or if you change the user name or password, Zebra Supersight will prompt you for a user name and password at each log in.

The default user name and password are:

User name	MtxUser
Password	Matrox

❖ Note that the user name and password are case-sensitive.

UEFI setup utility

To enter the UEFI[1] setup utility, you must first access your SHB, following one of the suggestions presented in the *Accessing your Zebra Supersight*, earlier in this chapter.

Once you have access to the specific SHB, press the power button to turn it on and then press the **F2** or **Delete** key during power-up self-test (POST) for that SHB. You only have a few moments to press the key before the boot-up process continues.

Starting and turning off individual SHBs

When the unit is on, you can restart the unit and SHBs using one of the techniques described below.

Warning

When restarting and/or turning off the SHBs separately, there is a risk of causing system instabilities (system freeze and BSOD on other SHBs) if inter-node communications are involved. In such a case, it is preferable to just shut-down and restart the whole unit using the power button.

- Use the keyboard, connected to the required SHB via USB, and press the **Control-Alt-Delete** keys simultaneously. Follow all on-screen instructions to restart your SHB. Repeat for each SHB in your unit.

- Press the SHB 1 power button to turn the unit off, and then press the same button to turn the unit on again. All SHBs will shut down, and then start up again.

❖ Note that Zebra Supersight power button 2 is not connected by default. If you do want to connect power button 2, please contact Zebra Technical support for assistance.

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1. On legacy computers, this was referred to as a BIOS, and in some menu items, BIOS and UEFI are still used interchangeably.

Turning off the Zebra Supersight unit

There are different ways to turn off the Zebra Supersight unit:

- **Shutting down entire unit.** Press and immediately release the SHB 1 power button. This will allow the Microsoft Windows operating system to shut down properly.

- **Shutting down each SHB.** Press the **Control-Alt-Delete** keys on the keyboard attached to the required SHB, and then select **Shut Down** in the Microsoft Windows on-screen dialog box. This will allow you to save files and close running applications before commanding the SHB to shut down.

  - ❖ When restarting and/or turning off the SHBs separately, there is a risk of causing system instabilities (system freeze and BSOD on other SHBs) if inter-node communications are involved. In such a case, it is preferable to just shut-down and restart the whole unit using the power button.

- **Force a shut down.** Press and hold power button 1. This does not allow the Microsoft Windows operating system enough time to shut down properly for each SHB. Pressing and holding the power button is not the recommended way to turn off the unit; this way should only be used if all other ways have failed.

Important

Note that the power button of the Zebra Supersight unit toggles between the "On" and "Off" states for all SHBs in the unit. Therefore, for multi-SHB Zebra Supersight units (Duo and Quad), if some SHBs have been turned "Off" separately while others are still "On" (or if a first attempt of using the power button resulted in one or more SHBs to remain "On"), pushing the power button will result in SHBs that are still "On" being turned "Off", while those that were already "Off" to turn back "On". The Zebra Supersight unit as a whole will only be able to completely shut down when all SHBs have been turned "Off". To resolve such a situation, log onto each SHB that is left "On" and shutdown these units separately through the operating system. In situations where SHBs cannot be turned "Off" that way (either because of a system hang or any other situation preventing the operating system from turning the SHB "Off"), you can press and hold the power button for more than 4 seconds, until the unit and all of its SHBs have shut down entirely. All system fans will stop when the entire unit is "Off".

Networking connections

You can connect Zebra Supersight to your local area network (LAN), via Gigabit Ethernet (1000 BaseT) or Fast Ethernet (100 BaseT). To do so, connect a network cable to one of the two Gigabit Ethernet connectors, located on the back panel of the chassis. The top Ethernet connector (LAN 1) on the Q370 SHB bracket has an I219-LM network interface. The bottom Ethernet connector (LAN 2) on the Q370 SHB bracket has an I211-AT Ethernet connector.

The I219-LM Gigabit Ethernet connector provides Wake-on-LAN (WoL) and Intel Active Management Technology (AMT) for remote management. To enable the WoL feature, you must modify settings in your UEFI[1]. In the UEFI, navigate to the ACPI configuration section and enable "PCIe Devices Power On".

Required cabling for Ethernet connections

To make the connection, use an appropriate network cable. The required type of network cable depends on the type of connection:

Connection	Minimum category for network cable
Gigabit Ethernet	Category 5e (CAT5e)/ Category 6 (CAT6) cable
Fast Ethernet (100 Mbits/sec)	Twisted Pair Category 5 (UTP5) cable
10 Mbits/sec	UTP5/UTP3 cable

Each of the Gigabit Ethernet connectors on Zebra Supersight has 2 LEDs to convey network activity and speed information. For information on how to read the LEDs, see the *Front and back panel light emitting diodes (LEDs)* section, in *Appendix B: Technical reference*

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1. On legacy computers, this was referred to as a BIOS, and in some menu items, BIOS and UEFI are still used interchangeably.

Chapter

3

Cleaning the air filter and connecting devices to the backplane and SHB board

This chapter details how to clean the air filter and how to connect devices to the backplane and to the internal connectors of the Zebra Supersight SHB-Q370 board.

Overview

The Zebra Supersight unit is designed to accommodate hardware additions. The unit has internal connectors for one or more SHB (depending on the unit), PCIe boards, USB devices, memory modules, fans, and mass storage devices.

The first step in making internal hardware additions involves removing the chassis cover.[*] If you remove the chassis cover, you will have access to all the connectors located on the backplane and the SHB. To install/replace an SHB or install PCIe boards, you will then have to remove the retainer guide holding the boards in place.

Removing the front door from the chassis

The front door of the chassis can be removed for easier access to the front USB connectors, the power button, and the reset button. It is recommended to leave this door attached since it helps guard against accidentally hitting the power button or damaging the front ports; however, some space restrictions might require you to remove it if you need to leave it open.

To remove the front door from the chassis, do the following:

1. Unscrew the top two knobs that fasten the front door to the chassis.

2. With the front door laying flat, pull back the spring loaded metal latch in the front left corner of the door.

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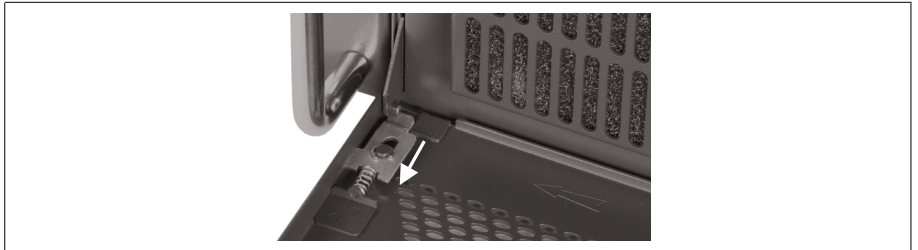
[*]. Be sure to always operate the unit with the cover on. This ensures that the fan properly removes any heat accumulating in the heat sinks.

3. As you continue to hold the spring loaded metal latch back, slide the hinges out from the hinge brackets, and the front door will be detached from the chassis.

4. After removing the chassis front door, ensure to store it someplace where you can access it if you need to reattach it.

Cleaning the air filter

The Zebra Supersight unit contains a polyurethane air filter. The air filter prevents dust and dirt from entering the unit.

To ensure efficient cooling of the Zebra Supersight unit, you must regularly clean the air filter.

1. Before cleaning, power down and unplug the Zebra Supersight unit from its power source.

2. Open the front door of the Zebra Supersight unit by unscrewing the knobs in the top right and left corners of the front panel. The front panel door can now swing open for you to access the filter cover.

3. Using a household vacuum, turned on at a low setting, position the vacuum nozzle in front of the air vents on the front panel of Zebra Supersight. Excess dust and particles will be safely removed through the air vents.

Removing the chassis cover

To remove the chassis cover, perform the following:

1. Power down the Zebra Supersight SHB and turn off the Zebra Supersight unit. See *Chapter 2: Turning off the Zebra Supersight unit* for more information.

Important

2. Unplug the Zebra Supersight unit from its power source.

3. Remove the 2 screws found at the back of the Zebra Supersight unit's chassis cover, and the 1 screw on the top front of the chassis cover (see the illustration in step 4).

4. With the unit laid flat, face the front panel, place your hands on top of the chassis, and slowly slide the cover toward the back of the unit, so that the cover separates from the rest of the unit.

Removing cover of Zebra Supersight unit

Remove all screws

Side panel

Back panel

Side panel

Back panel

Slide cover toward back of unit
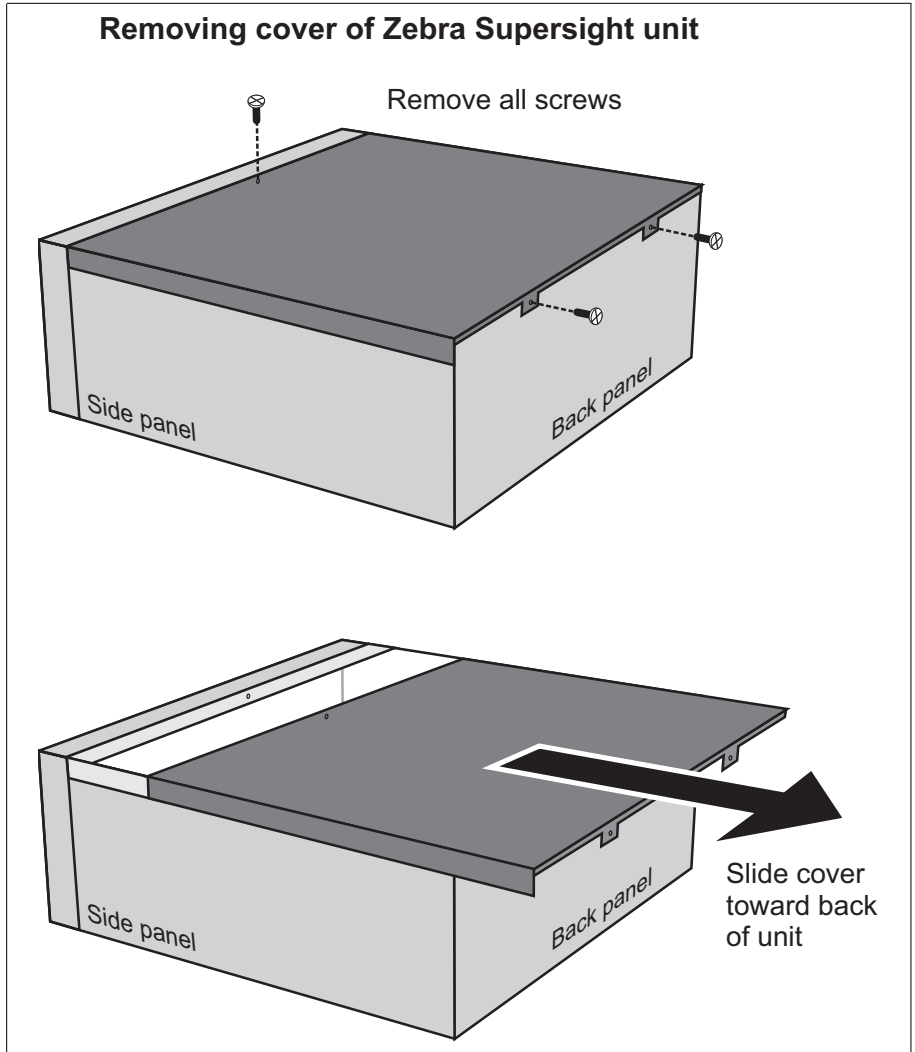
5. Lift the cover from the unit.

Warning   Once you have removed the cover and exposed the SHB, do not touch the heat sink on the SHB; soon after the unit has been turned off, it might still be very hot.

Removing the retainer guide

The Zebra Supersight SHB board and PCIe boards installed in your Zebra Supersight are held in place with a retainer guide and plastic holding clips. When adding a new board to your Zebra Supersight unit or adding/removing memory from the Zebra Supersight SHB, the retainer guide must first be removed. To do so, perform the following:

1. Open the chassis by following the steps explained in *Removing the chassis cover* subsection, earlier in this chapter.

2. Remove the screw holding the retainer guide in place.

3. Loosen the tightening screws on the plastic holding clips and rotate them up and away from the board.

4. Lift the unscrewed end of the retainer guide up and slide the other end out.
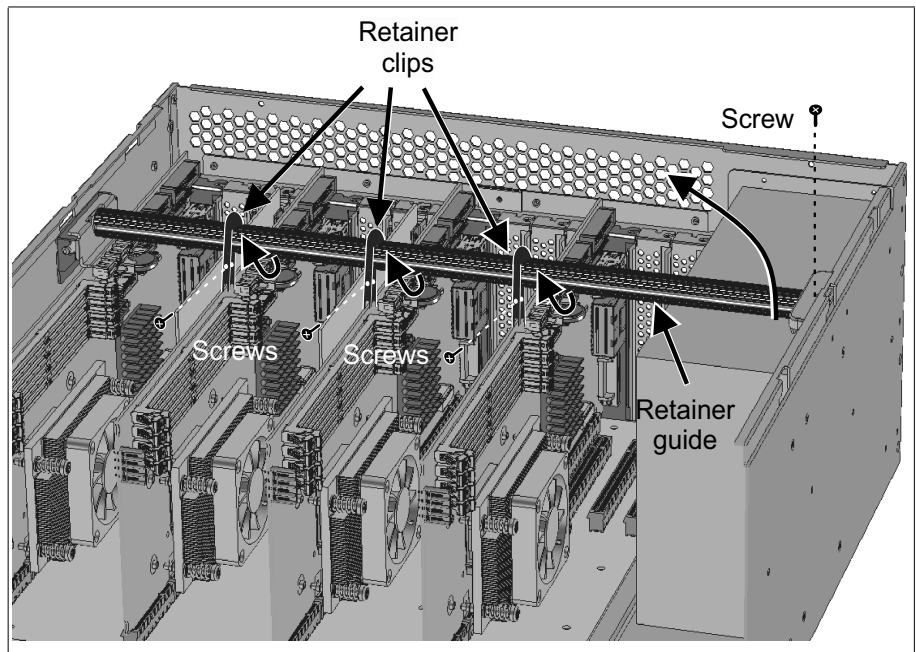
Removing the retainer guide bracket

Before you remove or re-install the first SHB, you must remove the retainer guide bracket. If you do not do this step, you risk damaging your SHB. To remove the retainer guide bracket, perform the following.

1. Using a Phillips head screwdriver, unscrew the single screw that holds the retainer guide bracket to the chassis.
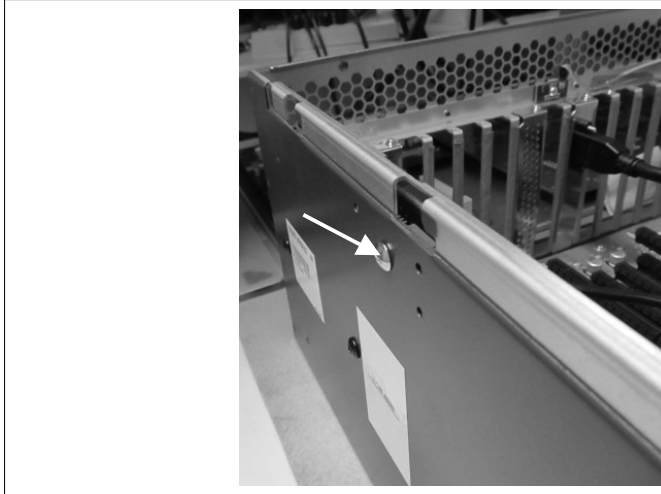
2. Once the screw is removed and the bracket is loose, slowly pull the bracket away from the chassis body. Be careful not to hit the SHB as you move the bracket out of the chassis.
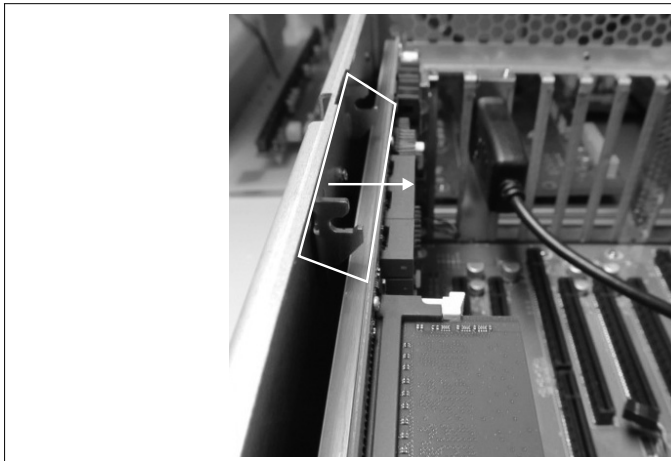
Adding boards to the backplane

Before adding boards to the backplane, you need to select the appropriate slot, based on the SHB that needs to control it, and the number of PCIe lanes that the add-on board requires to run at an optimal speed. Each SHB controls its own add-on boards. The configuration file used establishes which SHB controls a specific slot. Although mechanically all PCIe connectors are x16, the maximum lane width at which an add-on board can operate is established by the configuration file, the slot selected, and the other boards installed. The following sections describe some possible backplane configurations, and how to install and remove add-on boards.

Possible backplane configurations

Each Zebra Supersight unit comes with at least one Zebra Supersight SHB, which must be installed in SHB connector 1. The diagram below shows the locations of each connector in relation to the slots on the back of the chassis.

Inside your Zebra Supersight (from the front)

* Slots 4, 8, and 12 have no corresponding connector. These can be used for adapter brackets or to fit double-wide boards.
† SHB connector 2 and PCIe connector 3 share slot 5.
‡ SHB connector 3 and PCIe connector 6 share slot 9.
†† SHB connector 4 and PCIe connector 9 share slot 13.
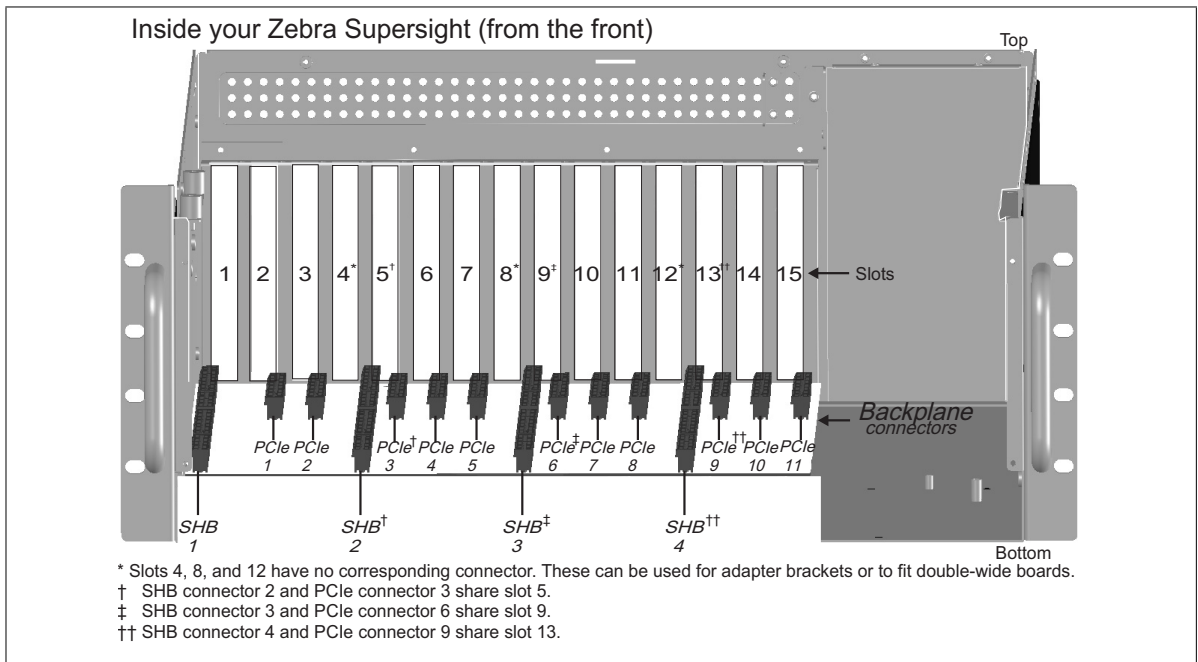
❖ Note that slots 4, 8, and 12 do not have a corresponding physical connector on the backplane. Instead, these slots can be used to install additional adapter brackets or double width boards.

The diagram below illustrates the maximum link width of the different SHB and PCIe slots, given the link width of the other slots. By default, each connected Zebra SHB communicates through one PCIe 3.0 switch with a dedicated x16 interface; SHBs 2, 3, and 4 can be configured to run at x8 if you need to allow for a higher link width on another slot in the same group.

Zebra Supersight

PCIe 3.0 switch

x16 · x8 · x16 · x8 · x16 · x8 · x16 · x8

Mux/Demux (×3)

x16/ x8/ x0/ x0 · x0/ x0/ x0/ x8 · x4**/ x8/ x16/ x8

Slots:
* | x16 (1) | x16 (2) | * | x16 (3) | x16 (4) | x16 (5) | * | x16 (6) | x16 (7) | x16 (8) | * | x16 (9) | x16 (10) | x16 (11)

x4** (dedicated interface between slot 1 SHB and x16 connector 1)

SHB connectors: 1, 2, 3, 4

*** Shared Mux/Demux group

Legend

☐ SHB connector   ■ PCIe connector   ▨ Paired PCIe connectors

Paired PCIe connectors are connectors where when the SHB is not installed in the group either one works at x16 or both work at x8.
* SHBs installed in SHB connectors 2, 3, and/or 4 will block the PCIe add-on slot to the right, and partially block the next slot. The partially blocked slots can still be used, but only by short (1/2 length) PCIe boards or auxiliary I/O adapter brackets.
** This PCIe connector communicates directly with the SHB through a dedicated x4 interface.
*** Shared Mux/Demux group. The populated SHB/PCIe connectors in a group establish the lane width of the connectors in this group.

With the exception of SHB connector 1, all SHB connectors share a Mux/Demux with the 2 PCIe connectors to their right.

The following table shows the maximum number of boards that can operate at a x16 and x8 lane width and how this influences the maximum number of boards that can operate at other lane widths (assuming installed in the appropriate slot):

Number of SHBs in the unit[*]	Maximum number of PCIe boards		
	Operating at x16	Operating at x8	Operating at x4
1	0	10	1
	1	8	1
	2	6	1
	3	4	1
2	0	9[†]	1
	0	8	2
	1	8	1
	2	5[†]	1
	2	4	2
4	0	7[‡]	1
	0	4	4

[*].   Zebra Supersight Duo has 2 SHBs; the Quad has 4 SHBs.

[†].   If SHB 2 operates at x8.

[‡].   If SHB 2, 3, and 4 operate at x8.

Available slots and board length

Zebra Supersight SHB-Q370 blocks one slot and partially blocks one additional slot to the right of the SHB slot. This partially blocked slot can still be used, but only by a short (1/2 length) PCIe board or auxiliary I/O adapter bracket. The table below describes which slots are blocked, or partially blocked (only allowing a half-length PCIe board), based on the slot in which an SHB is connected:

Slot in which the Zebra Supersight SHB-Q370 is installed	Is the PCIe connector blocked?										
	Slot 2	Slot 3	Slot 5	Slot 6	Slot 7	Slot 9	Slot 10	Slot 11	Slot 13	Slot 14	Slot 15
	PCIe 1	PCIe 2	PCIe 3	PCIe 4	PCIe 5	PCIe 6	PCIe 7	PCIe 8	PCIe 9	PCIe 10	PCIe 11
SHB connector 1	1/2										
SHB connector 2			Yes	1/2							
SHB connector 3						Yes	1/2				
SHB connector 4									Yes	1/2	

Possible Zebra Supersight node configurations

The configuration file used establishes which SHB controls a PCIe slot; this file also establishes whether the SHB communicates using a x16 or x8 lane width. Zebra Supersight comes preconfigured with the default configuration file given the number of SHBs in the unit. To change which SHB controls a PCIe slot, you need a configuration file specific to that configuration. To get a configuration file specific to the configuration that you require, contact your Zebra sales representative.

The table below shows the default configuration given the number of SHBs. Each different gray shade in this table represents one node. The number in the table represents the node number of the SHB connector.

Number of nodes	Slot 1	Slot 2	Slot 3	Slot 5		Slot 6	Slot 7	Slot 9		Slot 10	Slot 11	Slot 13		Slot 14	Slot 15
	SHB1	PCIe1	PCIe2	SHB2	PCIe3	PCIe4	PCIe5	SHB3	PCIe6	PCIe7	PCIe8	SHB4	PCIe9	PCIe10	PCIe11
1	1	1	1		1	1	1		1	1	1		1	1	1
2	1	1	1		1	1	1	2		2*	2	2	2	2	2
4	1	1	1	2		2*	2	3		3*	3	4		4*	4

*.   This slot is available with the Zebra Supersight SHB-Q370 installed, but can only fit a half length board when the SHB is installed.

1 node example

When there is only one node, the configuration could consist of the following boards installed in the unit:

- One Zebra Supersight SHB, connected to SHB connector 1.

- One auxiliary I/O adapter bracket, connected to another board but not connected directly to the backplane.

- One frame grabber board (for example, a Zebra Rapixo board) connected to PCIe connector 2.

- Six third-party GPU boards, connected to PCIe connectors 3, 5, 6, 8, 9 and 11, respectively. Each of these GPU boards requires two slots.
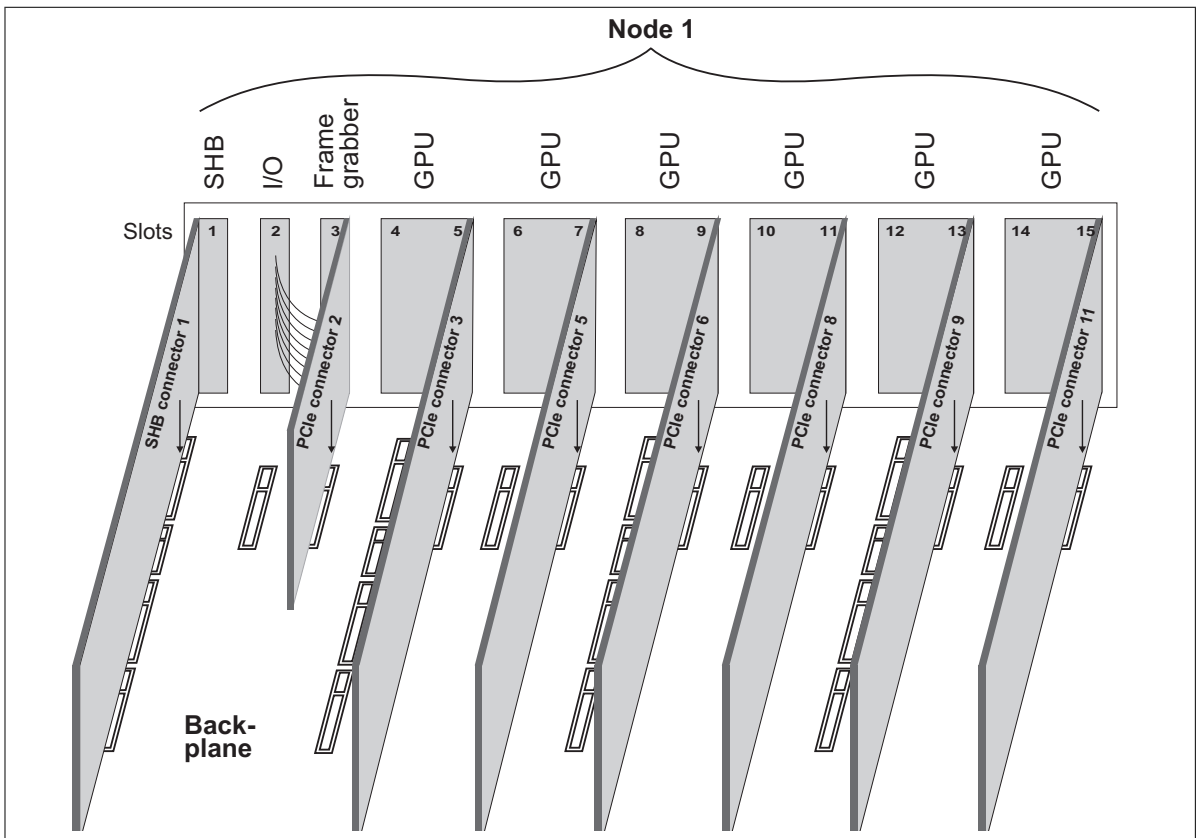
4 nodes example

When there are four nodes, the configuration could consist of the following boards installed in the unit:

- Four Zebra Supersight SHB boards, each connected to a different SHB connector.

- Four auxiliary I/O adapter brackets, each connected to another board but not connected directly to the backplane.

- Four frame grabber boards (for example, Zebra Rapixo boards), connected to PCIe connector 2, 5, 8, and 11, respectively.
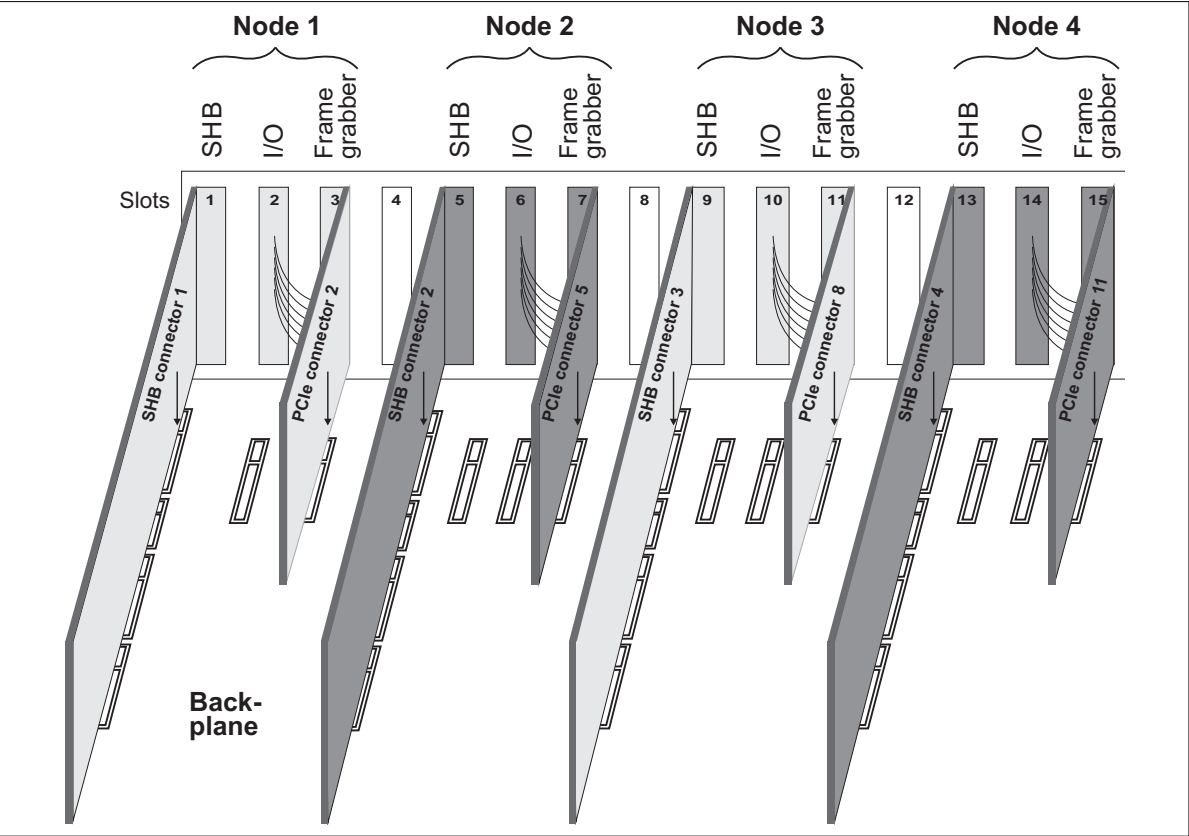
### Installing boards on the Zebra Supersight backplane

To install a PCIe board or reinstall an SHB on the backplane, perform the following.

Warning   Installing the SHB is a delicate process and can cause serious damage to the SHB if done improperly. Ensure that you avoid hitting any part of the SHB against the chassis when you install it in the Zebra Supersight unit. If you are re-installing the SHB found in SHB slot 1, make sure to first uninstall the bracket on the chassis that holds the retainer guide; see the *Removing the retainer guide bracket* subsection of the *Removing the retainer guide* section earlier in this chapter.

❖ Note that you should turn off the Zebra Supersight unit and unplug the unit from its power source before adding a board to the backplane. To properly turn off your unit, see *Chapter 2: Turning off the Zebra Supersight unit.*

1. Open the chassis by following the steps explained in *Removing the chassis cover* subsection, earlier in this chapter.

2. Select a slot. When moving an SHB to a different slot or installing a new PCIe board in the Zebra Supersight unit, refer to the *Possible backplane configurations* subsection, earlier in this section.

   ❖ Ensure that your first SHB is installed in SHB connector 1.

3. Press the board firmly but carefully into the selected PCIe or SHB connector on the backplane, while inserting the tab of the board's bracket into the groove at the bottom of the board cage. The illustration below shows an SHB being installed in an SHB connector.
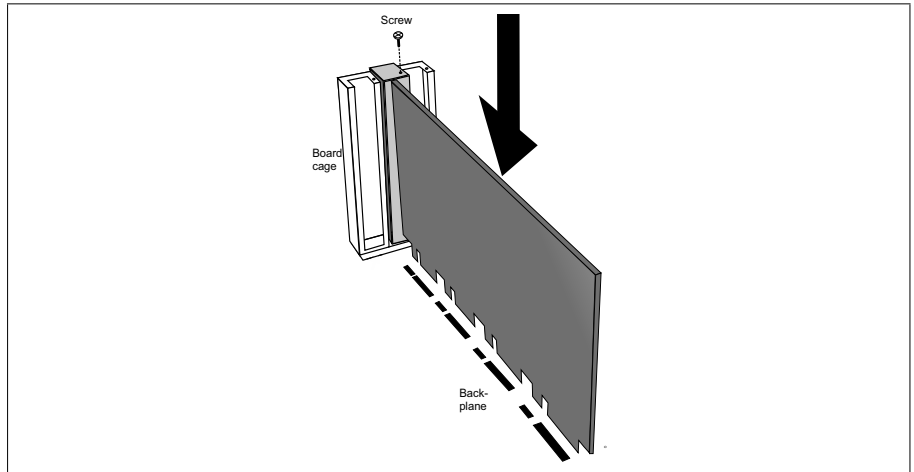
4. To fix the board more firmly to the board cage, attach the board's bracket to the board cage using a screw. Note that some boards have a double-width bracket that takes up two slots of the board cage (for example, some third-party GPU boards).

5. Connect a power cable from the Zebra Supersight power supply to your board, if required. The power cables inside your Zebra Supersight unit are 6+2 pin PCIe power cables. To ensure the attached board meets the requirements of the PSU, refer to *Electrical specifications* section, in *Appendix B: Technical reference*.

   Always use the shortest power cable possible to connect the SHB or PCIe board to your Zebra Supersight backplane. This helps avoid having cables touch the boards or the backplane, as well as cables from getting squeezed or worn.

6. Optionally, tuck unused cables beneath the drive-tray to reduce cable clutter in the chassis.

7. Re-install the chassis cover by reversing the steps described in the *Removing the chassis cover*, earlier in this chapter.

8. Reconnect the power source to the unit, and restart the Zebra Supersight SHB board.

Removing boards from the Zebra Supersight backplane

You might need to remove a PCIe or SHB board so that you can replace it, move it, or upgrade the memory attached to the SHB. To remove a PCIe or SHB board from the backplane, perform the following.

Warning

Removing the SHB is a delicate process and can cause serious damage to the SHB if done improperly. Ensure that you avoid hitting any part of the SHB against the chassis when you remove it from the Zebra Supersight unit. If you are removing the SHB found in SHB slot 1, make sure to first uninstall the bracket on the chassis that holds the retainer guide; see the *Removing the retainer guide bracket* subsection of the *Removing the retainer guide* section earlier in this chapter.

❖ Note that you should turn off the Zebra Supersight unit and unplug the unit from its power source before adding a board to the backplane. To properly turn off your unit, see *Chapter 2: Turning off the Zebra Supersight unit*.

1. Open the chassis by following the steps explained in *Removing the chassis cover* subsection, earlier in this chapter.

2. Unplug any power cables or connector cables that are attached to the SHB or PCIe add-on board.

3. Unscrew the PCIe or SHB board's bracket from the board cage of the Zebra Supersight unit.

4. Evenly pull the PCIe or SHB's board up from the backplane and allow the board's bracket to slide up and out of the unit's chassis cage.

5. Place the PCIe or SHB board on a flat non-static surface.

# Connecting devices to the internal connectors of the SHB

The following devices can be connected to the internal connectors of the Zebra Supersight SHB board: mass storage devices, memory modules, adapter brackets, and CPU fans. Typically, a hard disk drive, memory, and a CPU fan should already be pre-installed and connected to each SHB purchased with your unit.

Before connecting a device to the Zebra Supersight SHB, uninstall the SHB by following the instructions described in the *Removing boards from the Zebra Supersight backplane* section earlier in this chapter. Once you have connected the required device to the SHB, you can reinstall it using the instructions described in the *Installing boards on the Zebra Supersight backplane* section earlier in this chapter.

Connecting an M.2 device to the M.2 socket

The back of the Zebra Supersight SHB provides an M.2 M-Key socket. This socket can be used for installing an SSD or other M.2 device with an M-Key. To install an M.2 device in the socket, perform the following:

1. Lay the Zebra Supersight SHB flat on a non-static surface.

2. Slide the connecting edge of the mass storage device into the M.2 socket at a 20 degree angle from the surface of the Zebra Supersight SHB. The device should be securely in the M.2 connector while still allowing for some vertical play.
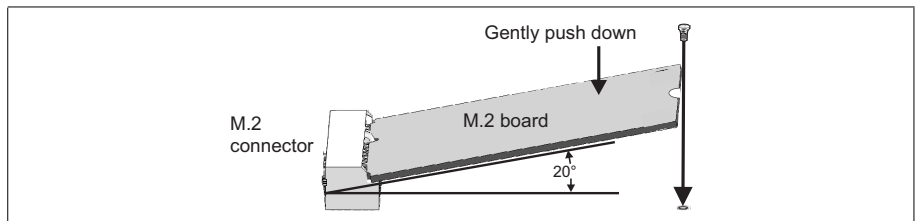
3. Press the mass storage device down towards the Zebra Supersight SHB and attach it with the provided screw.

    After reinstalling the SHB board, boot the unit and run the UEFI setup program (by pressing the F2 or Delete key during POST) to verify that the SSD is identified correctly.

Connecting additional mass storage devices

Each SHB has six 7-pin SATA connectors; to each, you can connect a mass storage device. Typically, each Zebra Supersight SHB purchased with the unit comes with its own mass storage device connected to one of its SATA ports and installed in a drive bay. The number of drive bays available for 2.5" hard disk drives will match the number of hard drives provided with the SKU of the Zebra Supersight unit that you ordered.

Important   The voltages that can be drawn from the power supply are outlined in the *Electrical specifications* section, in *Appendix B: Technical reference*.

Replacing a hard disk drive

Each Zebra Supersight SHB comes with a hard disk pre-installed in one of the available drive bays. To replace a hard disk drive, perform the following:

1. Slide the button on the front of the hard disk drive bay to the right. The bay's door opens to the right, and, if present, the hard disk drive pops out of the bay, disconnecting from the SATA data and power cables at the back of the drive.

2. If present, remove the hard disk drive.
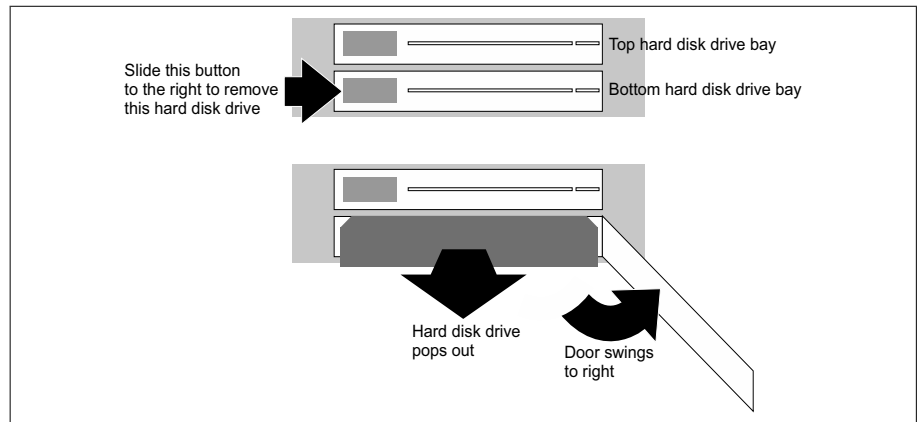
3. Insert the new drive, and push the drive all the way to the back.

4. Close the drive door. Since the hard disk drive bays are connected to your installed SHB, closing the door will automatically connect the hard disk drive to the SATA bay connector of the SHB (to which the associated SATA cable is connected) and to the unit's power source.

Important   5. The hard disk drives are hot-swappable; that is, they can be added or removed while the unit is still running. However, a drive that is running the operating system of a Zebra Supersight SHB board is not hot-swappable.

Installing or removing RAM

The Zebra Supersight SHB Q370 board features slots in which you can install dual channel RAM modules. The SHB has four 288-pin Long-DIMM slots, with each slot supporting a 2666 Mhz dual-channel DDR4 SDRAM unbuffered DIMM memory module, up to 16 Gbytes in size. The total amount of memory can be up to 64 Gbytes. The Zebra Supersight SHB-Q370 comes preinstalled with two 8-Gbyte modules.

Installing memory   To install a memory module on the SHB:

1. Lay the Zebra Supersight SHB flat on a non static surface.

2. Spread the clips at each end of the memory slot.

DDR4 SDRAM Long-DIMM module

Zebra Supersight SHB-Q370 board with four DIMM slots
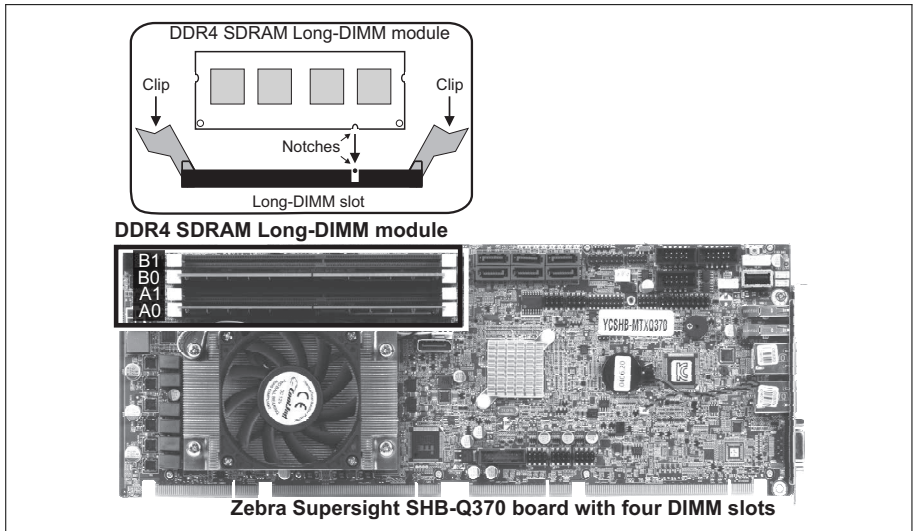
❖ Note that the Zebra Supersight SHB-Q370 supports dual-channel memory technology. This means that for optimal performance and reliability, when installing new memory modules, you should install the modules in pairs, starting with slots A0 and B0. Install identical memory modules in slots A0 and B0 and identical modules in slots A1 and B1. Mixing different models is not recommended.

3. Position the module over the Long-DIMM slot, such that the notch along the module's bottom edge is aligned with the notch of the Long-DIMM slot. If installing additional memory modules, ensure they are the same model as the ones already installed.

4. Gently insert the bottom edge of the module into the slot. If properly inserted, the two clips (one on each side of the module) will close automatically.

Removing memory

To remove the existing memory module(s) from the Zebra Supersight SHB board:

1. Lay the Zebra Supersight SHB flat on a non-static surface.

2. Spread the clips at each end of the Long-DIMM slot.

3. Lift the module out of the slot and store it in a non-static bag.

Adjusting the new memory settings

If MIL is installed on the unit, you must adjust the unit's new memory settings using MilConfig (the MIL Configuration utility). Refer to the MIL User Guide for more information on using this utility.

Chapter

4

Power management and temperature control

This chapter describes power management and temperature control for your Zebra Supersight unit.

Power management

The Zebra Supersight SHB is compliant with both advanced configuration and power interface (ACPI) technology and Enhanced Intel SpeedStep technology (EIST). Combined, these two technologies assist with power management and temperature control. To configure ACPI and EIST for the Zebra Supersight SHB, adjust your UEFI settings.

ACPI technology

Zebra Supersight is compliant with advanced configuration and power interface (ACPI) technology. This technology monitors how the UEFI, operating system, and peripheral devices communicate with each other about power usage. ACPI allows the Zebra Supersight unit to conserve energy by transitioning unused devices into lower power states. ACPI components gather information about power consumption from the SHB and pass this information onto the operating system. The operating system then manages power to the SHB's different components on an as-needed basis.

The ACPI features implemented on the Zebra Supersight SHB include:

• The ability for the SHB to perform a complete shut-down, in which it will be powered off automatically. This is helpful when, for example, thermal conditions become excessive.

• Support for processor power management.

• Support for temperature management using active and passive cooling techniques.

❖ To maximize the performance of your PCIe boards (and in rare cases, their stability), power management for PCIe boards and your Zebra Supersight are disabled by default. It is not recommended to change these settings. Further information is provided in the descriptions of the associated power management UEFI items.

Enhanced Intel SpeedStep technology

The Intel processor uses Enhanced Intel SpeedStep technology (EIST) to enable very high performance while also meeting the power-conservation needs of the Zebra Supersight SHB. The operating system dynamically adjusts processor voltage and core frequency (CPU speed) based on the CPU's demand for processing power. This results in decreased average power consumption and decreased average heat production.

Thermal control

Using the Zebra Supersight Configuration utility, you can monitor the system temperature, as well as update temperature thresholds, over temperature values, fan speed, wait times, and counter values that are used to trigger an overheating shutdown event.

The Zebra Supersight unit protects against an overheating event using the default values set in the Zebra Supersight Configuration utility. An overheating event will happen on Zebra Supersight if the maximum temperature thresholds, across any of the 11 temperature sensors throughout the unit, are reached for a set amount of time, after which the unit is forcibly shut down to prevent any damage. No message is displayed when this event takes place, since a shut down must be executed immediately. After the unit is shut down by the overheating event, you can open the Zebra Supersight Configuration utility, and it will display a message that a shutdown took place.

Warning

You should not change the default settings in the Zebra Supersight Configuration utility without first consulting with Zebra technical support.

Appendix A:
Hardware glossary

This appendix defines some of the specialized terms used in this Zebra Supersight document.

Glossary

- **Bandwidth.**

  A term describing the capacity to transfer data. Greater bandwidth is needed to sustain a higher transfer rate. Greater bandwidth can be achieved, for example, by using a wider bus.

- **Bus.**

  A pathway along which signals are sent, generally in two directions, for communication of data.

- **Cache.**

  A memory area of the processor. The processor can access data from its cache faster than it can access data from system RAM or mass storage devices.

  Many processors have a *primary* cache and a *secondary* cache. When searching for information, the processor first refers to the primary cache. If it cannot find the required information, it will then refer to the secondary cache.

- **Contiguous memory.**

  A block of physical memory occupying a single, consecutive series of locations.

- **DDR4 SDRAM.**

  Double data rate three synchronous dynamic random access memory. A type of RAM used for image capture and processing.

  See also *RAM*.

- **DHCP.**

  Dynamic host configuration protocol. A DHCP server automatically assigns IP addresses to clients who log onto a TCP/IP network. It eliminates the need to manually assign and manage unique IP addresses for all of the machines on a network.

- **DIMM**.

  Dual in-line memory module. A DIMM is a memory module with integrated circuitry. Long-DIMM modules are typically used in embedded devices and desktop computers.

  See also *RAM.*

- **Ethernet.**

  The most common standard for the physical wiring and signalling on a local area network (LAN). The Gigabit Ethernet LAN supports data transfer at rates of 10, 100, or 1000 Mbits/sec.

  See also *LAN*.

- **Ethernet cable.**

  A wire similar to a telephone cable that carries the signals between Ethernet devices.

- **Frame.**

  A single image grabbed from a video source.

- **Full-duplex mode.**

  A communication method that involves sending and receiving information simultaneously. For example, a switch can operate in full-duplex mode.

- **Grab.**

  To acquire an image from a video source.

- **Half-duplex mode.**

  A communication method that involves sending or receiving information. However, this cannot be done simultaneously. For example, all hubs operate in half-duplex mode.

- **Host.**

  In general, Host refers to the principal processor in one's computer.

- **IP address.**

  Internet protocol address. The electronic address of a computer (station) on a TCP/IP network, which is unique for every client and server station. Client workstations have either a permanent or dynamically assigned address. The IP address is a dot address that is written as four sets of numbers separated by periods, also called dotted quad notation (for example, 203.142.62.2). The TCP/IP packet uses 32 bits to hold the IP address.

- **LAN.**

  Local area network. A LAN is a group (or network) of computers and other devices that are connected together to share the resources (files, printers, devices, and other services such as internet access) of a single workstation or server within a small geographical area. The main LAN connection technology used is Ethernet cable, which connects users (clients) to the LAN's server. Clients download applications and/or services from the server, and then run or use them from their local computer.

- **Network bindings.**

  The series of associations that enable communication among the network services, protocols, and adapters in your computer. In this case, "binding" refers to the conversion or association of symbolic addresses in the operating system to storage-related addresses. These associations can be adjusted to increase the performance of certain network services among multiple network adapters.

  - ❖ Note that you should not adjust network bindings unless you are an experienced network administrator and are familiar with the requirements of your network software.

- **PCIe.**

  Peripheral Component Interconnect Express. The standard used for the computer bus that acts as an interface between hardware devices, such as an add-on board and your Zebra Supersight.

- **POST.**

  Power-on self test. This test is performed by the UEFI, as soon as the computer is turned on. POST gathers information about what the unit contains, and ensures that everything is working properly. It works by performing a list of tasks related to testing the RAM, the on-board hardware, the add-on boards, the keyboard, the hard disk drives, and other installed components. If all the tasks are completed, the UEFI will proceed to boot the operating system. If a task cannot be completed, POST will report an error to the UEFI, and a message will be displayed.

- **Protocol.**

  A set of standards (rules/formats) for transmitting information "packets" between computer software and hardware devices. Information packets are structured according to the standards of a protocol. On a network, the data link or Media Access Control protocol standard, such as the CSMA/CD standard, provides the access method, and TCP/IP provides the control and routing method to transmit (move) information packets.

- **RAM.**

  Random access memory. RAM is memory in which the operating system, application programs, and data in current use are stored so that they can be accessed by the processor. Information stored in RAM is lost when power is cut off. RAM chips can be typically installed on a memory module (such as a DIMM memory module) that is plugged into the motherboard.

- **Subnet mask.**

  The sequence of numbers that the router uses to determine which parts of the 32-bit IP address is specific to the subnetwork (that is, common to all of the machines on the network) and should be used for transmitting the information "packet" to the subnetwork. This mask saves the router from having to handle the entire 32-bit IP address; instead, it can look at only the bits enabled (set to "1") by the mask. For example, if the network and subnet addresses are contained in the upper 24 bits, and the specific Host address is contained in the lower 8 bits, then you can convey this information to the router to allow quicker transmission to the subnet by passing the following mask value: 255.255.255.0 (11111111.11111111.11111111.00000000).

- **TCP/IP.**

  Transmission control protocol/internet protocol. The basic communication protocol (or language) of the internet that has become the global standard for network communications since it ensures faithful data transmission. TCP/IP uses the *client-server* communication model, in which a computer user (client) makes requests and is provided services by a network computer (server).

  TCP/IP is a multi-layered protocol. In the transport layer, TCP ensures delivery of the entire file/message. TCP manages the assembly of files/messages into "packets" that are transmitted to and received by another TCP layer. That TCP layer then reassembles the packets into its original format. In the network layer, IP routes the data to different destinations (LANs or WANs) based on the network address. TCP/IP is a routable protocol, which ensures that all messages contain the address of both the destination computer (station) and destination network. This makes it possible for messages to be transmitted to multiple networks.

- **UEFI.**

  Unified Extensible Firmware Interface. The interface between the operating system and the hardware. It is also responsible for booting the operating system when a unit is turned on. On legacy computers, this was referred to as a BIOS, and in some menu items, BIOS and UEFI are still used interchangeably.

Appendix B:
Technical reference

This appendix summarizes the key features of the Zebra Supersight unit. In addition, this appendix provides descriptions for external and internal connectors of the Zebra Supersight unit.

Summary

This appendix describes the technical specifications of the Zebra Supersight unit. In addition to the backplane and SHB, the Zebra Supersight unit features the following hardware:

- Up to four bays for hard disk drives. One hard disk drive is typically pre-installed per SHB ordered with the unit.

- One power-supply and three chassis fans.

Backplane

The backplane of the Zebra Supersight unit has the following specifications:

- Form factor 12 7/8" x 12 3/8" (32.8 cm x 31.4 cm).

- The Zebra Supersight backplane can accommodate the following hardware:

Number of SHBs in the unit[*]	Maximum number of PCIe boards		
	Operating at x16	Operating at x8	Operating at x4
1	0	10	1
	1	8	1
	2	6	1
	3	4	1
2	0	9[†]	1
	0	8	2
	1	8	1
	2	5[†]	1
	2	4	2
4	0	7[‡]	1
	0	4	4

[*].   Zebra Supersight Duo has 2 SHBs; the Quad has 4 SHBs.
[†].   If SHB 2 operates at x8.
[‡].   If SHB 2, 3, and 4 operate at x8.

Zebra Supersight SHB-Q370

Zebra Supersight SHB-Q370 has the following specifications:

- Full size form factor PICMG 1.3 specification, 13.3" x 4.96" (33.8 cm x 12.6 cm). Information about the Zebra Supersight SHB-Q370's form factor and mechanical specification is available on the website of the PCI Industrial Computer Manufacturers Group, http://wwww.picmg.org.

- Intel i7-8700 CPU (6-core/12-thread 3.2 GHz/4.6 GHz processor with a 12-Mbyte cache).

- Two Gigabit Ethernet interfaces that use standard RJ-45 Ethernet connectors[*]. One uses an I219-LM Gigabit Ethernet controller, while the other uses an I211-AT PCIe Ethernet controller. Each supports 10 /100/1000 Mbps connections.

- Support for two display devices, which can be connected to the DisplayPort (internal)[†] and VGA video output connectors. The video output connectors support the following maximum resolutions:

Connector	Maximum resolution
VGA	1920 x 1200 @ 60 Hz
DisplayPort version 1.2	4096 x 2304 @ 60 Hz

- Thirteen USB interfaces. There are two USB 3.1 connectors on the bracket at the back of the Zebra Supersight unit and four USB 2.0 connectors on the front of the unit. In addition, on the board, there is one USB 3.1 header, three USB 2.0 headers (two 2.0 headers on the first SHB are already connected to the four USB 2.0 connectors on the front of the unit), and one USB 2.0 Type-A connector. To each header, you can connect two USB devices using an adapter bracket.

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[*]. PROFINET and PoE are not supported on either Ethernet connector.

[†]. You will need to use a cable extension bracket or adapter bracket to access the DisplayPort. When using the cable extension bracket, the maximum cable length that you can use will be impacted.

- Four 288-pin Long-DIMM slots, with each slot supporting a 2666 Mhz dual-channel DDR4 SDRAM unbuffered DIMM memory module, up to 16 Gbytes in size. The Zebra Supersight SHB-Q370 comes preinstalled with two 8-Gbyte dual channel DDR4-2666 unbuffered DIMM modules. The total amount of memory can be up to 64 Gbytes.

- Six on-board 7-pin SATA3 data connectors. Each SATA3 data connector transfers data at SATA 3.0 (6.0 Gbps) speeds.

- Three on-board RS-232 serial connector headers.

- One on-board M.2 M-key socket. This socket is used to connect an additional M.2 storage device.

Fans

- Three chassis cooling fans are included and are rated at 180 cubic feet/minute (5.1 m^3/minute), with operating voltage and current up to 12 V, 4.1 A, respectively.

Default hard disk drive

Up to four 2.5" hard disk drives can come pre-installed, one for each SHB ordered with the unit. The default, pre-installed hard disk drive(s) have the following features:

- Support for SATA 3.0 (6.0 Gbps) connections, also referred to as SATA III or SATA 600.

- Storage capacity minimum: 500 Gbytes[*].

- 2.5-inch platter[*].

- Rotational speed: 7200 rpm[*].

- SATA 3.0 (6.0 Gbps) connector.

- Hot-swappable.

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[*]. The hard drive specifications (for example, storage capacity, size, and rotational speed) might change over time. Contact your Zebra sales representative for details.

SHB coin cell battery/Pile bouton du SHB

- Used to maintain time and date settings of the unit's real-time clock.

  Utilisée pour maintenir l'heure et la date de l'unité.

- Battery voltage: 3 V.

  Voltage de la pile: 3 V.

- Diameter (max): 20 mm.

  Diamètre (max): 20 mm.

- Battery type: CR2032.

  Type de pile: CR2032.

Environmental specifications

- 0°C (32°F) to 35°C (95°F) operating temperature.

- -40°C (-40°F) to 85°C (185°F) storage temperature.

- Up to 90% (non-condensing) relative humidity.

Electrical specifications

The power supply has the following specifications:

	Zebra Supersight
Power supply	1000 W
AC input	12-7 A (nominal), 40 A (in-rush), 110-240 Vac, 47 - 63 Hz
DC output	• +3.3 V_{dc}, 25 A • +5 V_{dc}, 25 A • +5 $V_{standby}$[†], 3.5 A • +12 V1$_{dc}$, 50 A • +12 V2$_{dc}$, 50 A • -12 V_{dc}, 0.8 A • Max power for +3.3 V, +5 V, 170 W for both power rails combined • Max power for +3.3 V, +5 V, and +12 V2, 600 W for all three power rails combined
Supplemental power connectors	• Six 4-pin LP4 (+12 V2$_{dc}$ 6 A and +5 V_{dc} 6 A, for each harness). • One 8-pin EPS (+12 V2$_{dc}$ 24 A).[*] • Five 6+2 pin PCIe 150 W power (one on +12 V1$_{dc}$, four on +12 V2$_{dc}$: 12.5 A for each harness using the 6-pin and 2-pin connectors together, limited to 6.25 A when only using the 6-pin connector).

[*].   The single EPS connector is already in use when you receive your unit.

Warning:

- In addition to the PSU power limits documented on the PSU and in the manual, the wires in the cable harness, used to bring power to backplane and SHB components and computer peripherals, have a current rating that must be met at all times for each individual wire in the harness.

- The unit ships with a number of cables in the PSU harness already connected to the backplane, SHB, and peripherals. These cables should not be disconnected by the user.

- The use of cable splitters or cable adapters that would allow exceeding the current rating of the harness should not be used.

- Only use the cable adapters in the accessory kit supplied with the unit.

- Before connecting power to user add-on boards and peripherals, make sure the unit is off and the AC cord is disconnected.

Mise en garde:

- En plus des limites documentées sur le bloc d'alimentation et dans le manuel, chacun des fils et des câbles des harnais, utilisés pour alimenter les composantes de l'unité ainsi que les périphériques de l'ordinateur, ont des spécifications en courant qui doivent être rencontrées en tout temps.

- L'unité est expédiée avec certains des câbles du bloc d'alimentation déjà connectés à l'unité et aux périphériques. En aucun cas ces câbles ne doivent être déconnectés par l'utilisateur.

- L'utilisation de câbles adaptateurs pour fins de duplication du harnais ou permettant d'en excéder leur capacité en courant ne sont pas permis.

- N'utilisez que les câbles adaptateurs fournis en accessoires avec l'unité.

- Avant de connecter tout câble d'alimentation aux périphériques ou aux cartes, s'assurer que l'unité est éteinte et que le câble d'alimentation secteur est débranché.
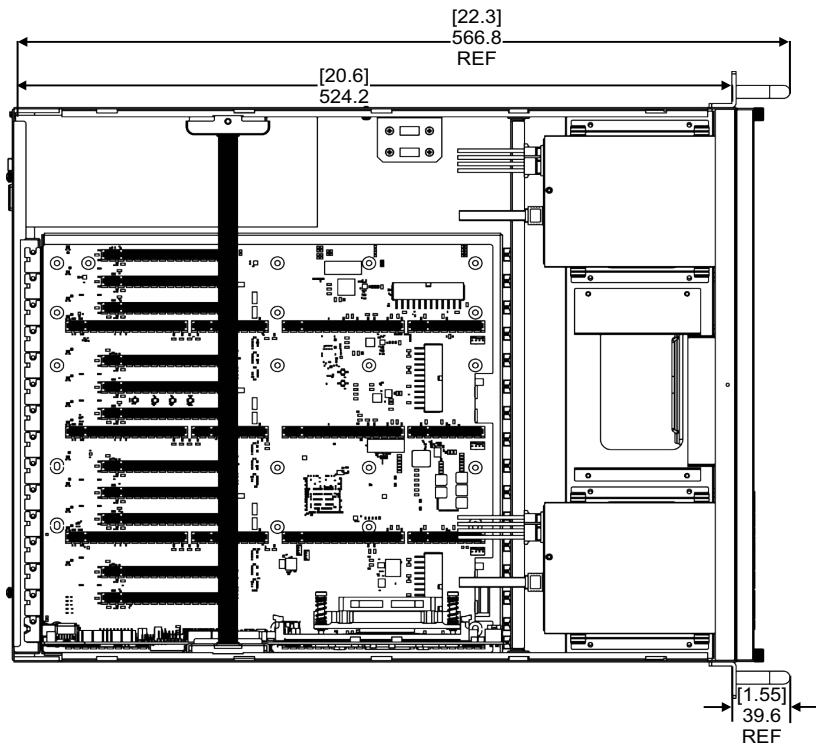
Chassis

Zebra Supersight has a rugged, heavy-duty steel chassis with mounting points that allow mounting the unit to other equipment or sturdy surfaces.

- Length: 22.31" (566.8 mm).

- Width: 19" (482.6 mm).

- Height: 6.89" (175 mm).

Important   Use model #6-32 UNC screws (or screws of similar length and specifications) for mounting the Zebra Supersight unit to other equipment. The recommended length of the screws is 1/8" (0.32 cm).
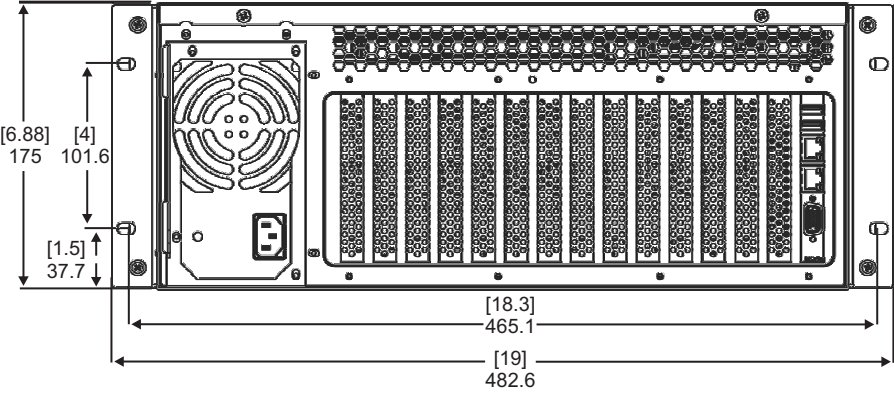

Cover / top chassis dimensions given in [inches] and mm

Side view chassis dimensions with distance between slide rail mounting holes given in [inches] and mm

[1.5] 39
[17.2] 438.2
[4.5] 115
[4.7] 120
[1.06] 26.9
[1.1] 28.5
[3.6] 92
[3.6] 92
[3.6] 92
[3.6] 92
[5] 126.4
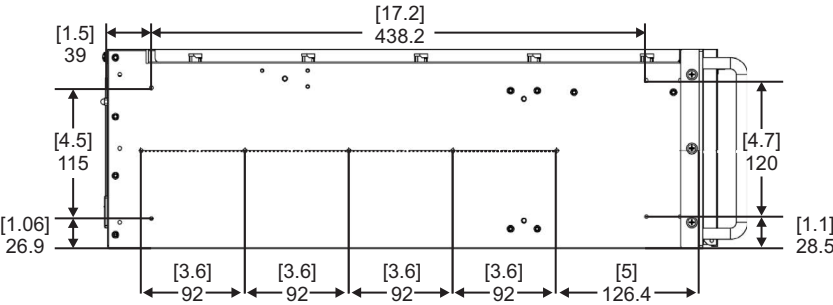
Rear view chassis dimensions with distance between rack mount holes

[6.88] 175
[4] 101.6
[1.5] 37.7
[18.3] 465.1
[19] 482.6

Front and back panel light emitting diodes (LEDs)

To establish the operating status of your Zebra Supersight unit, the unit has light emitting diodes (LEDs) on the front and back panels.

Front panel LEDs

There are four[*] LEDs on the front panel of the Zebra Supersight unit. The first group of LEDs are connected to SHB 1 and the second group of LEDs are disconnected.
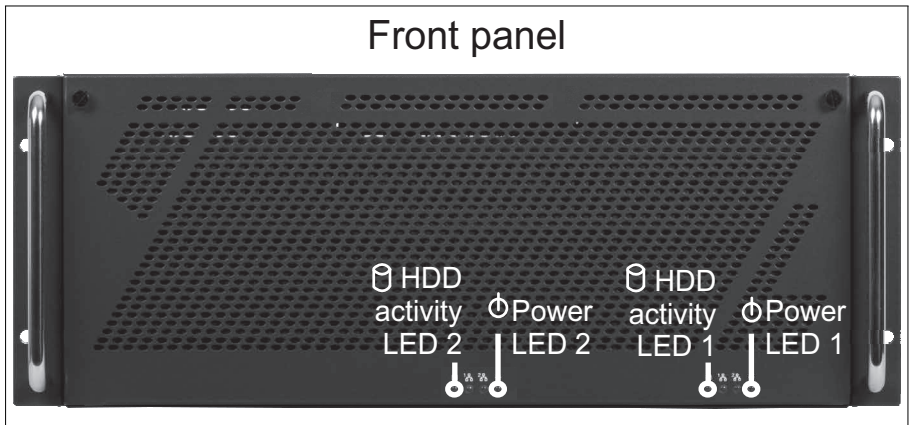
These LEDs report the following:

- **Power LED (green)**. The power LED turns green when the connected SHB is receiving power from the power supply. Power LED 1 is connected to SHB 1 and Power LED 2 is disconnected.

- **HDD activity LED (yellow)**. The HDD activity LED turns yellow when the primary mass storage device of the connected SHB is active (for example, the device is saving or retrieving data). HDD activity LED 1 is connected to SHB 1 and HDD activity LED 2 is disconnected.

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*. Note that earlier versions of the chassis only had two LEDs on the front panel.

LEDs on the bracket of the SHB

There are two LEDs for each of the Gbit Ethernet connectors on the bracket of each Zebra Supersight SHB-Q370.
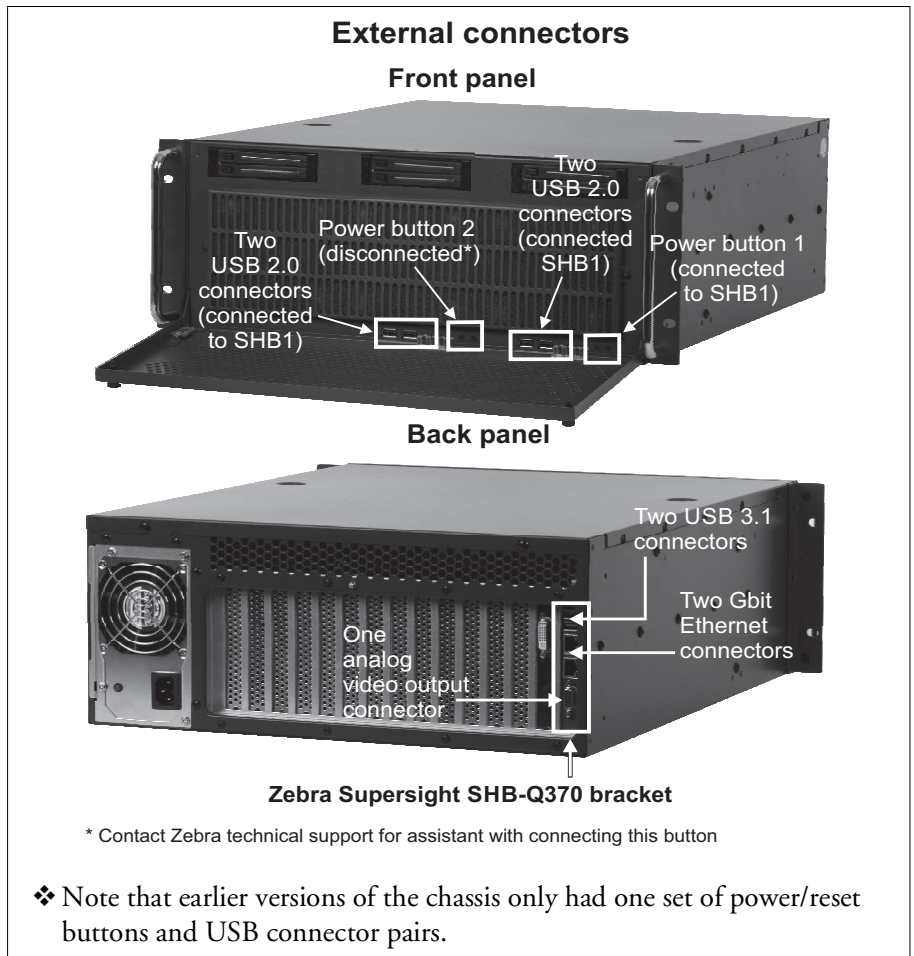

Gbit LED

Network activity/Link LED

SHB-Q370 bracket

Back panel
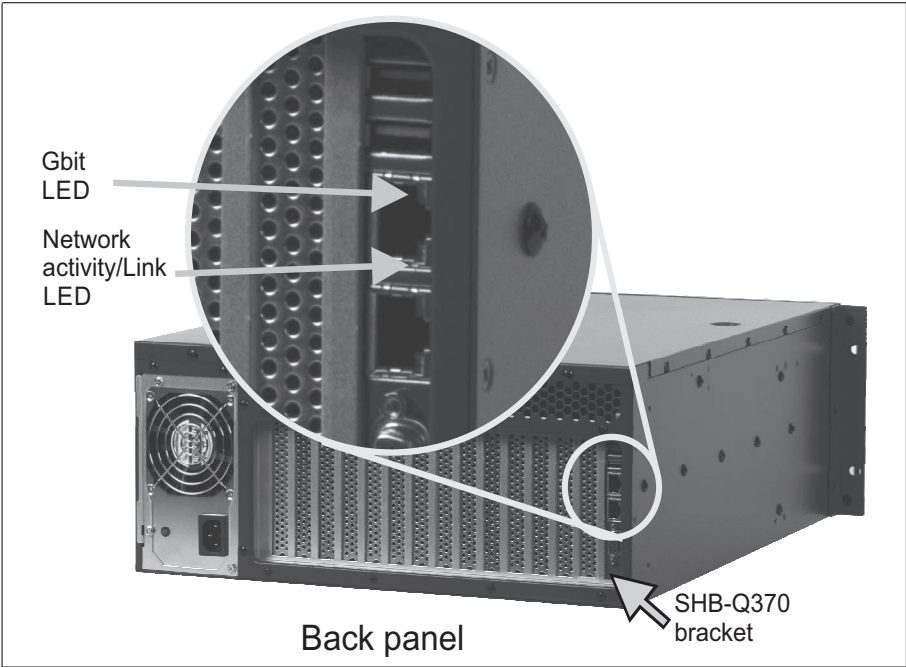
The following table describes the LEDs of each connector:

LED	Description
Network activity/Link LED	Turns on when connected to a network.
	Blinks whenever packets are being transmitted or received.
	Turns off when no network connection is present.
10/100/1000 LED	Turns orange when operating in 100 BaseT mode.
	Turns green when operating in 1000 BaseT mode.
	Turns off when one of the following conditions is true: • No network connection is present. • The unit is operating in 10 BaseT mode. If the unit is operating in 10 BaseT mode, the Activity/Link LED will be solid or blinking.

Pinout descriptions of external connectors

The Zebra Supersight unit features USB, Gbit Ethernet, analog video output, and power supply connectors on its front and back panels.

This section assumes that one SHB has been installed in the Zebra Supersight unit. If there are additional Zebra or third-party boards installed in your unit, there might be additional external connectors on the back panel of your unit. See the documentation that is included with the board for more information. Be aware that your Zebra Supersight is not designed to be placed on its side (vertically). Doing so will obstruct venting.

External connectors

Front panel

Two USB 2.0 connectors (connected SHB1)

Power button 2 (disconnected*)

Two USB 2.0 connectors (connected to SHB1)

Power button 1 (connected to SHB1)

Back panel

Two USB 3.1 connectors

Two Gbit Ethernet connectors

One analog video output connector

Zebra Supersight SHB-Q370 bracket

* Contact Zebra technical support for assistant with connecting this button

❖ Note that earlier versions of the chassis only had one set of power/reset buttons and USB connector pairs.

USB 2.0 connectors

The four USB 2.0 connectors on the front panel are standard rectangular, Series "A", 4-pin receptacles, that are connected to SHB 1. The USB 2.0 interfaces run at 480 Mbps. The pinout of these standard connectors is described in the USB Specification v2.0 from the USB Implementers Forum.

- Operating voltage and maximum current: 5 V, 500 mA.

- Over-current protection: Yes.
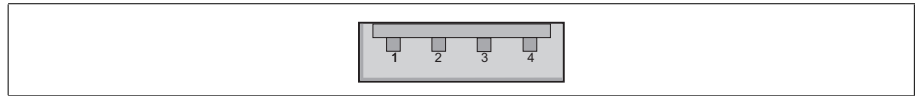
USB 3.1 connectors

The two USB 3.1 connectors on the back panel are standard rectangular, Series "A", 9-pin receptacles. These connectors are backwards compatible with USB 3.1/2.0/1.1. The USB 3.1 interfaces run at 5 Gbps. The pinout of these USB 3.1 connectors is described in the USB Specification v3.0 from the USB Implementers Forum.

- Operating voltage and maximum current: 5 V, 900 mA.

- Over-current protection: Yes.
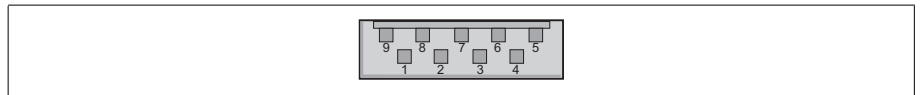
Gigabit Ethernet connectors

The two Gigabit Ethernet connectors are identical 8-pin, RJ45 connectors. The top Ethernet connector (LAN1) on the SHB-Q370 bracket is managed by an I219-LM Ethernet controller. The bottom Ethernet connector (LAN2) on the SHB-Q370 bracket is managed by an I211-AT Ethernet controller. The pinout of these connectors follows the 1000 BaseT Gbit Ethernet standard found in the IEEE 802.3-2002 standard.
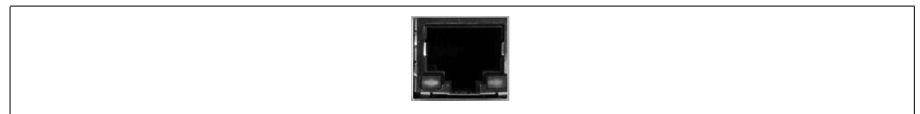
Analog video output (VGA) connector

The analog video output (VGA) connector is a high-density D-subminiature 15-pin, (HD-15[*]) female connector. The pinout is outlined in the following table.
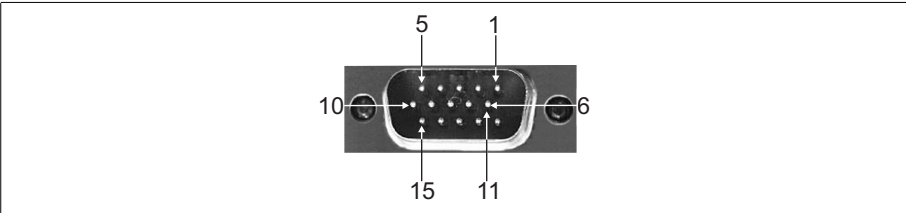
Pin	Signal	I/O	Description
1	RED	O	Red.
2	GREEN	O	Green.
3	BLUE	O	Blue.
4	NC	-	Not connected.
5-8	GND	-	Ground.
9	+5V	O	Power +5V; Includes an auto-resettable fuse. Maximum current: 5 V, 0.75 A.
10	GND	-	Ground.
11	NC	-	Not connected.
12	SDA	I/O	DDC serial data line.
13	HSYNC	O	Horizontal synchronization.
14	VSYNC	O	Vertical synchronization.
15	SCL	I/O	DDC data clock line.

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[*]. Previously referred to as DBHD-15, but more accurately known as DE-15.

Descriptions of internal Zebra Supersight SHB-Q370 connectors

The diagrams in the following subsections will refer to the connector labels as they appear in the diagram below. On the Zebra Supersight SHB-Q370, the following connectors can be found:

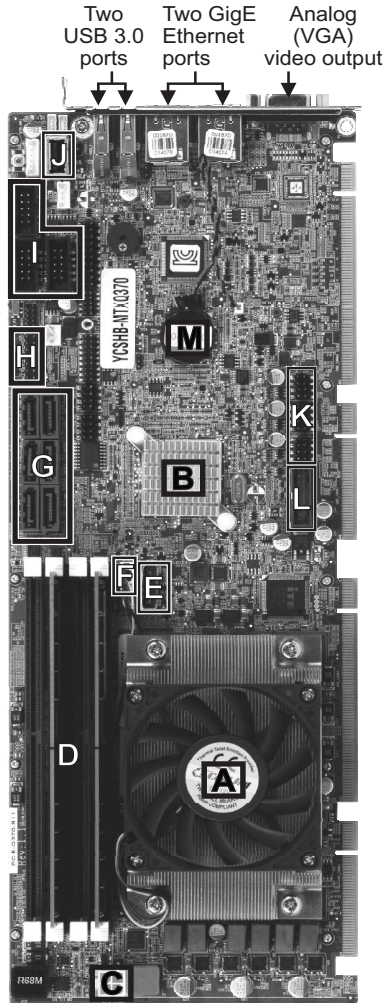**Zebra Supersight**
SHB-Q370
System Host board

Chips

A - Intel i7-8700 processor
B - Q370 platform controller hub

Frontside internal connectors

C - ATX power connector
D - DDR4 DIMM slots
E - DisplayPort connector
F - CPU fan power-supply connector
G - SATA3 data connectors (6)
H - Front panel LED header
I - RS-232 serial port headers (3)
J - USB 2.0 Type-A connector
K - USB 2.0 headers (3)
L - USB 3.1 header
M - Coin cell battery

Backside internal connectors

N - M.2 M-Key connector

Two USB 3.0 ports

Two GigE Ethernet ports

Analog (VGA) video output

Frontside connectors
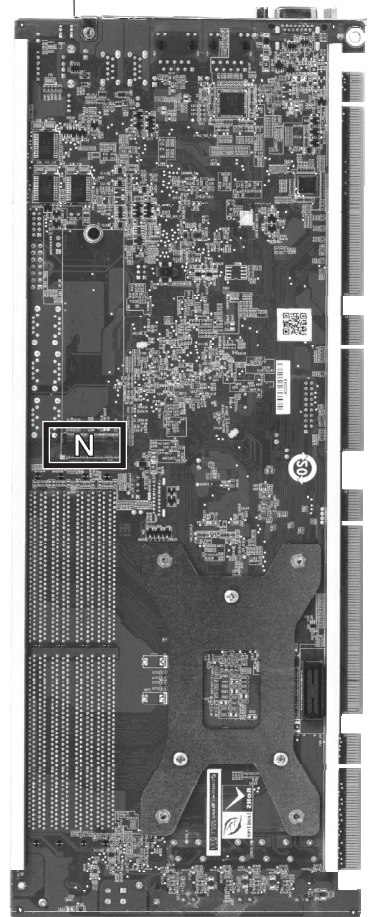
Backside connectors

ATX power connector

The ATX power connector (label C on diagram) is an ESP 4-pin, 12 V, female CPU power connector. This connector should be connected to the Zebra Supersight unit's power source to power the CPU.

Pins	Description
1, 2	Ground
3, 4	Power (+12 V DC)

CPU fan power-supply connector

The CPU fan power-supply connector (label F on diagram) is a 4-pin standard, 2 mm, male connector. The CPU fan power-supply connector on your Zebra Supersight SHB-Q370 is used to power the fan that cools the CPU.
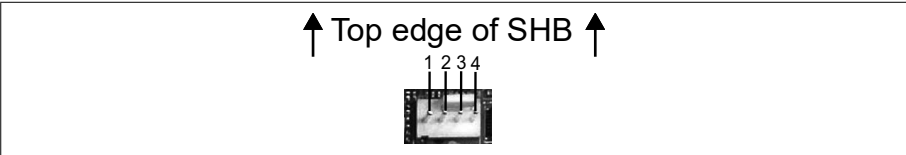
The following table describes the 4-pin fan power supply connector.

Pin	Voltage
1	Ground.
2	Power 12 V.
3	Reads the speed of the fan (TACH).
4	Sets the speed of the fan, using pulse-width modulation (PWM).

DisplayPort connector

The DisplayPort connector (label E on diagram) is a 20-pin female connector used to connect to a display device, such as a monitor. The connector supports DisplayPort specification version 1.2. The pinout of this connector is standardized by the Video Electronics Standards Association. You will need to use a cable extension bracket or adapter bracket (for example, a passive DP-to-DP extension or a DP-to-DVI active adapter) to access the connector externally. If using a cable extension bracket or adapter bracket, be aware that the length of the DisplayPort cable affects the final resolution output to the monitor. Ideally, use as short of a cable as possible to ensure resolution is not lost.


SATA3 data connectors for mass storage devices

The six SATA3 data connectors (label G on diagram) are 7-pin, male connectors. One SATA connector is taken up by the mass storage device that ships with the SHB. The pinout for the SATA3 connectors is available on the Serial ATA International Organization's website, http://www.sata-io.org.

Front panel LED header

The front panel LED header (label H on diagram) is a standard 14-pin, 2.54 mm spacing, male connector that provide connection to the POWER and HDD LEDs on the front of the Zebra Supersight unit. By default, the front panel LED header of the first SHB is connected to the front LEDs of the unit.
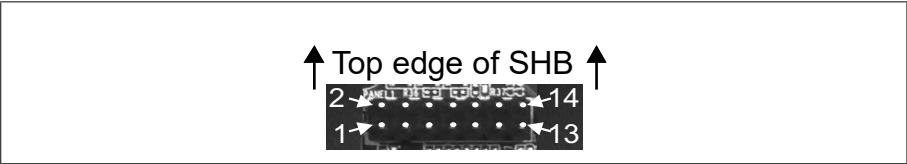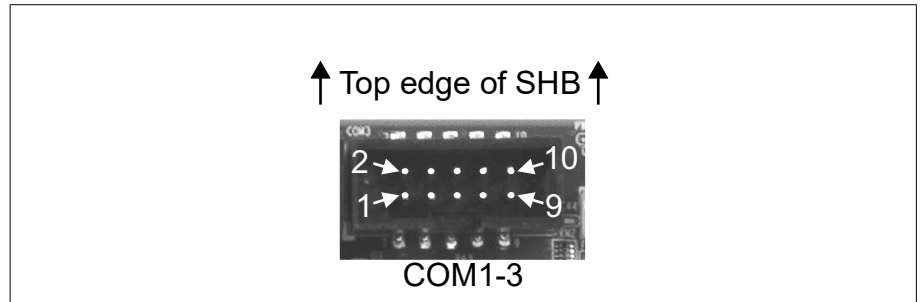

The following table describes each pin of the front panel LED header on the Zebra Supersight SHB-Q370.

Pins	Signal
1	PWR_LED+
2	SPKR+
3	NC
4	NC
5	PWR_LED-
6	NC
7	PWR_BTN+
8	SPKR-
9	PWRN_BTN-
10	NC
11	HDD_LED+
12	RESET+
13	HDD_LED-
14	RESET-

Serial port headers

The three serial port headers (label I on diagram) are standard 10-pin, 2.54 mm spacing, male connectors that provide RS-232 connections.

The serial ports are capable of sending and receiving information to and from local devices; the driver and the receiver of which are always enabled. Each port is controlled by a universal asynchronous receiver-transmitter (UART) device, which converts serial data into parallel data when receiving information. Conversely, when transmitting information, the UART converts parallel data to serial data.

The following table describes each pin of the RS-232 serial port headers for Zebra Supersight SHB-Q370 (COM 1-3).

Internal RS-232 connector pins (COM1-3)	Signal	I/O	Description of RS-232 standard
1	DCD	I	Data carrier detect.
2	DSR	I	Data set ready.
3	RXD	I	Receive data.
4	RTS	O	Request to send.
5	TXD	O	Transmit data.
6	CTS	I	Clear to send.
7	DTR	O	Data terminal ready.
8	RI	I	Ring indicator.
9	GND	-	Ground.
10	GND	-	Ground.

### On-board USB 2.0 type-A connector

The single on-board USB 2.0 type-A connector (label J on diagram) is a rectangular, Series "A", 4-pin receptacle. The USB connector supports high-speed (up to 480 Mbits/sec) peripherals or USB dongles. The pinout of the USB 2.0 connector follows Specification v2.0 from the USB Implementers Forum.

❖ Note that depending on the size of the USB device, there might be spacing conflicts with nearby add-on boards.

USB 2.0 header

The three USB 2.0 headers (label K on diagram) are standard, 2 mm spacing, 8-pin male connectors. Each header is used to connect two additional 4-pin USB 2.0 devices (such as USB keyboards), or one USB flash module using a custom adapter bracket.
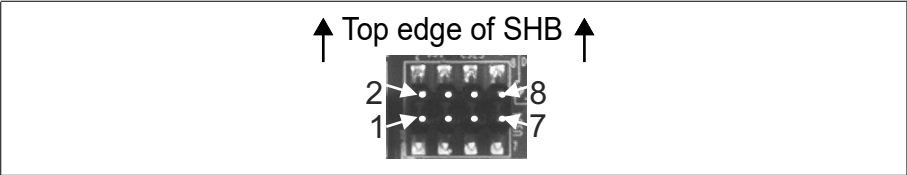

The pinout of the USB header is as follows:

Pins	Signal
1	VCC
2	GND
3	USB_DATA-
4	USB_DATA+
5	USB_DATA+
6	USB_DATA-
7	GND
8	VCC

USB 3.1 header

The single USB 3.1 header (label L on diagram) is a 19-pin male connector. The USB 3.1 header supports two ports; you can use a custom adapter bracket with two USB 3.1 connectors to access these from the exterior of the unit. The USB 3.1 interface runs at 5 Gbps.
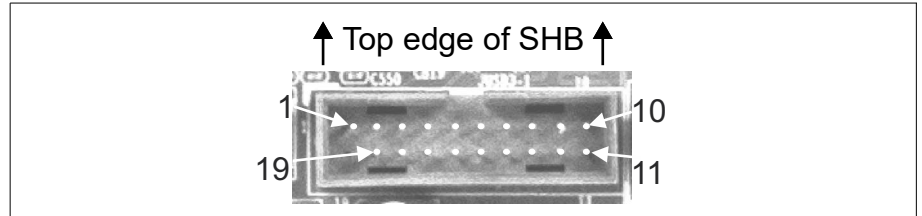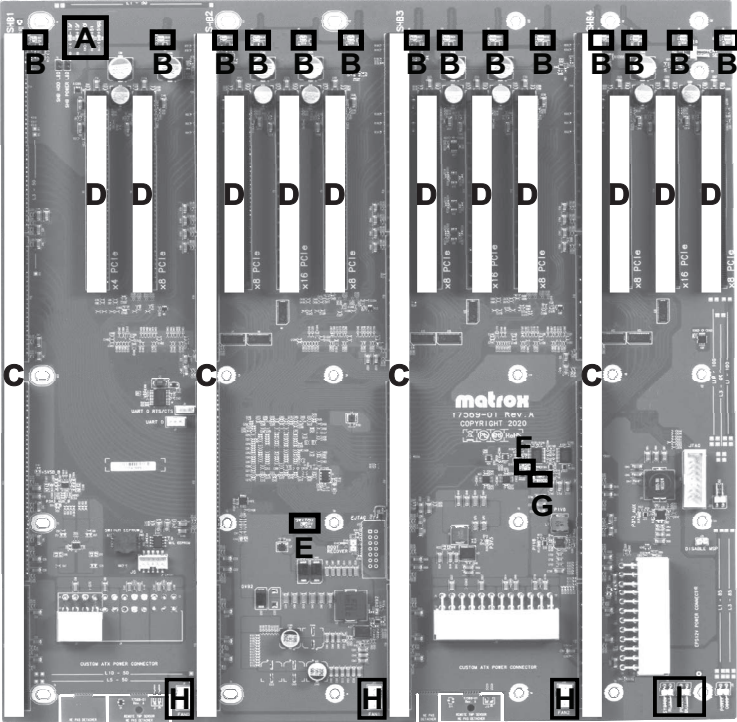

Pin	Signal
1	VCC
2	USB3_RX-
3	USB3_RX+
4	GND
5	USB3_TX-
6	USB3_TX+
7	GND
8	USB_DATA-
9	USB_DATA+
10	NC
11	USB_DATA+
12	USB_DATA-
13	GND
14	USB3_TX+
15	USB3_TX-
16	GND
17	USB3_RX+
18	USB3_RX-
19	VCC

Pinout descriptions of backplane connectors and LEDs

You will find the following internal connectors and LEDs on the backplane:


PCIe backplane of a Zebra Supersight unit

Connectors and LEDs

A - Voltage rail LEDs

B - SHB/PCIe activity and status LEDs

C - PICMG 1.3 system Host board connectors (4)

D - PCIe connectors (11)

E - Switch heartbeat LED

F - Backplane microcontroller heartbeat LED

G - Backplane power-good LED

H - Chassis fan power-supply connectors (3)

I - System reset and power button connectors

Voltage rail LEDs

The voltage rail LEDs (label A on diagram) indicate whether your power-supply and the power connector are providing sufficient voltage.
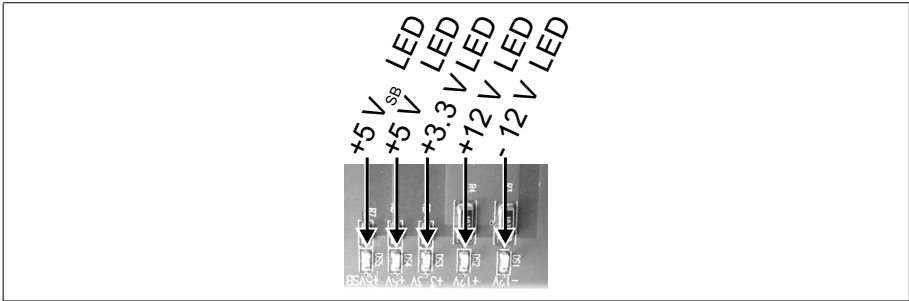
The Zebra Supersight backplane uses DC voltage rails from the internal power supply and provides it to the various devices on the backplane. When one or more Zebra Supersight feature fails to function, technical support might ask you to verify whether the voltage rail LEDs are lit. Names are provided to help with communication

SHB/PCIe activity and status LEDs

The SHB/PCIe activity and status LEDs (label B on diagram) are found at the back of the PCIe and SHB connectors.
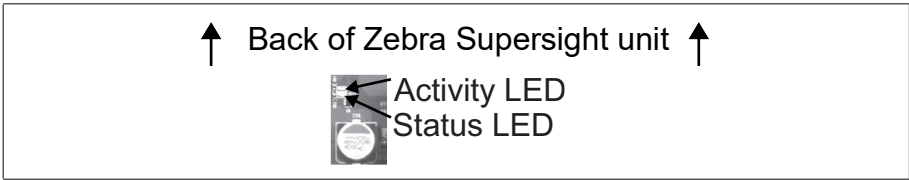
The following table describes the activity and status LEDs:

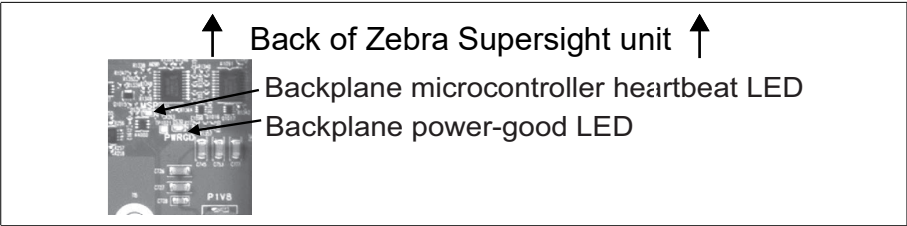| LED	Description
Activity/Link LED	Turns red when packets are actively transmitting across the link.
	Turns off when no packets are transmitting across the link.
Status LED	Turns green when the PCIe link is on.
	Turns off when the PCIe link is off.

Switch heartbeat LED

The switch heartbeat LED (label E on diagram) is found between SHB connectors 2 and 3.
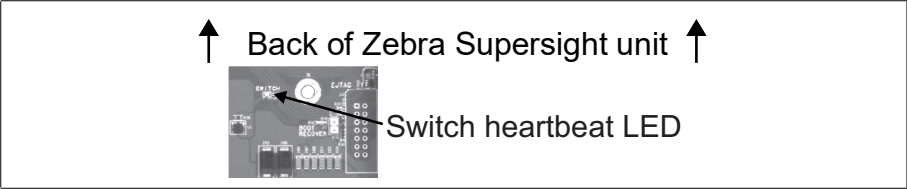
This LED indicates the state of the switch. If the LED is blinking green, then the switch is functioning properly.

Backplane microcontroller heartbeat and backplane power-good LEDs

The backplane microcontroller heartbeat LED (label F on diagram) and backplane power-good LED (label G on diagram) are found between SHB connectors 3 and 4.


The following table describes the LEDs:

LED	Description
Backplane microcontroller heartbeat LED	Blinking green when the microcontroller is functioning normally.
	Turns off or solid green when there is a problem with the microcontroller.
Backplane power-good LED	Solid red when the power to the backplane is appropriate.

Chassis fan power-supply connectors

The four chassis fan power-supply connectors (label H on diagram) are 4-pin standard, 2 mm male fan power-supply connectors. They provide power to the fans inside the Zebra Supersight chassis.


↓ Front of Zebra Supersight unit ↓
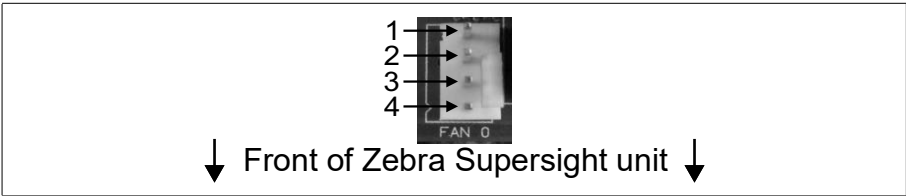
The pinout for each of the unit's fan power-supply connectors is as follows:

Pin	Voltage
1	Ground.
2	Power 12 V. It is recommended not to draw more than 1 A in total.
3	Reads the speed of the fan (TACH).
4	Sets the speed of the fan, using pulse-width modulation (PWM).

System reset and power connectors

The system reset and power connectors (label I on diagram) are each 2-pin standard, right-angle, 2 mm, male connectors. Each connect to the buttons on the chassis.

↓ Front of Zebra Supersight unit ↓
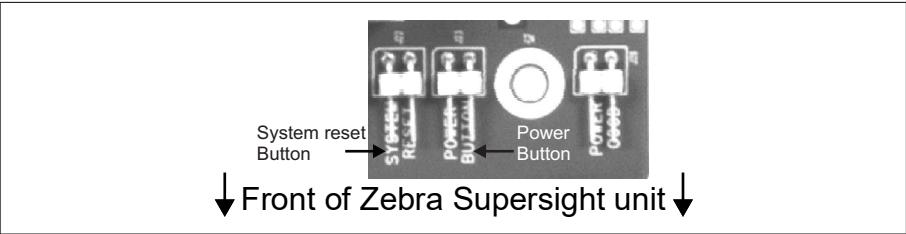
The system reset and power connectors provide the following functions:

- The system reset connector connects to the system reset button on the front panel. The system reset button allows you to reboot the unit.

- The power button connector connects to the power button on the front panel. The power button allows you to power-on the unit or turn off the unit.

Appendix C: Listing of Zebra Supersight units

This appendix lists the key feature changes for specific versions and revisions of the Zebra Supersight units

Key feature changes

Part number	Version	Description
S-SOLO-MTRX	001.00	First shipment of Zebra Supersight Solo with Gen 3 backplane.
	001.40	New chassis with extra USB connectors, LEDs, and power buttons.
S-DUO-MTRX	001.00	First shipment of Zebra Supersight Duo with Gen 3 backplane.
	001.40	New chassis with extra USB connectors, LEDs, and power buttons.
S-QUAD-MTRX	001.00	First shipment of Zebra Supersight Quad with Gen 3 backplane.
	001.40	New chassis with extra USB connectors, LEDs, and power buttons.

Regulatory Compliance

FCC Compliance Statement

Warning

Changes or modifications to these units not expressly approved by the party responsible for the compliance could void the user's authority to operate this equipment.

The use of shielded cables for connections of these devices to other peripherals is required to meet the regulatory requirements.

Note

These devices comply with Part 15 of FCC Rules. Operation is subject to the following two conditions:

1. These devices may not cause harmful interference, and

2. These devices must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for Class A digital devices, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of these devices in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his/her own expense.

Industry Canada Compliance Statement

These digital apparatuses do not exceed the Class A limits for radio noise emission from digital apparatuses set out in the Radio Interference Regulations of Industry Canada.

Ces appareils numériques n'émettent pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de Classe A prescrites dans le Règlement sur le brouillage radioélectrique édicté par Industrie Canada.

EU Notice (European Union)

WARNING: These are class A products. In a domestic environment these products may cause radio interference in which case the user may be required to take adequate measures.

AVERTISSEMENT: Ces appareils sont des produits informatiques de Classe A. Lorsque ces appareils sont utilisent dans un environnement résidentiel, ces produits peuvent entraîner des interférences radioélectriques. Dans ce cas, l'usager peut être prié de prendre des mesures correctives appropriées.

This device complies with EC Directive 89/336/EEC for Class A digital devices. They have been tested and found to comply with EN55022/CISPR22 and EN55024/CISPR24 when installed in a typical class A compliant host system. It is assumed that these devices will also achieve compliance in any Class A compliant system.

Ces unités sont conformes à la Directive communautaire 89/336/EEC pour les unités numériques de Classe A. Les tests effectués one prouvé qu'elles sont conformes aux normes EN55022/CISPR22 et EN55024/CISPR24 lorsqu'elles sont installées dans un système hôte typique de la Classe A. On suppose qu'ils présenteront la même compatibilité dans tout système compatible de la Classe A.

Directive on Waste Electrical and Electronic Equipment (WEEE)

Europe

(English) European user's information – Directive on Waste Electrical and Electronic Equipment (WEEE)

Please refer to the Zebra Website (**zebra.com/weee**) for recycling information.

(Français) Informations aux utilisateurs Européens – Règlementation des déchets d'équipements électriques et électroniques (DEEE)

Se référer au site Web de Zebra (**zebra.com/weee**) pour l'information concernant le recyclage.

(Deutsch) Information für europäische Anwender – Europäische Regelungen zu Elektro- und Elektronikaltgeräten (WEEE)

Bitte wenden Sie sich an dem Zebra-Website (**zebra.com/weee**) für Recycling Informationen.

(Italiano) Informazioni per gli utenti europei – Direttiva sui rifiuti di apparecchiature elettriche ed elettroniche (RAEE)

Si prega di riferirsi al sito Web Zebra (**zebra.com/weee**) per le informazioni di riciclaggio.

Caution: Coin cell battery replacement

Risk of explosion if the battery is replaced with an incorrect type. Dispose of used batteries according to local instructions and regulations.

Attention: remplacement de la pile bouton

Il y a risque d'explosion si la pile est remplacée par un type incorrect. Disposer des pile usagées conformément aux instructions et aux réglementations de votre région.

Power supply

CAUTION

THE POWER SUPPLY CORD IS USED AS THE MAIN DISCONNECT DEVICE.
ENSURE THAT THE SOCKET-OUTLET IS LOCATED/INSTALLED NEAR THE EQUIPMENT AND IS EASILY ACCESSIBLE.

ATTENTION

LE CORDON D'ALIMENTATION EST UTILISÉ COMME INTERRUPTEUR GÉNÉRAL.
LA PRISE DE COURANT DOIT ÊTRE SITUÉE OU INSTALLÉE À PROXIMITÉ DE L'ÉQUIPEMENT ET ÊTRE FACILE D'ACCÈS.

In case of a defect

NO SERVICEABLE PARTS INSIDE THE UNIT.
IF UNIT BECOMES DEFECTIVE IT MUST BE RETURNED TO ZEBRA FOR REPAIR.

Dans le cas d'une défectuosité

PAS DE PIÈCE REMPLAÇABLE À L'INTÉRIEUR DE L'UNITÉ.
SI L'UNITÉ EST DÉFECTUEUSE, ELLE DOIT ÊTRE RETOURNÉE À ZEBRA POUR RÉPARATION.

Limited Warranty

Refer to the warranty statement that came with your product.