PRIMERGY SX650 Storage Blade

Operating Manual

Edition November 2008

Comments… Suggestions… Corrections…

The User Documentation Department would like to know your opinion of this manual. Your feedback helps us optimize our documentation to suit your individual needs.

Feel free to send us your comments by e-mail to manuals@fujitsu-siemens.com.

Certified documentation
according to DIN EN ISO 9001:2000

To ensure a consistently high quality standard and user-friendliness, this documentation was created to meet the regulations of a quality management system which complies with the requirements of the standard DIN EN ISO 9001:2000.

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1 Preface

Figure 1: PRIMERGY SX650 Storage Blade

The PRIMERGY SX650 Storage Blade serves as a storage subsystem for the PRIMERGY BX620 S4 server blade and its successors. The PRIMERGY SX650 Storage Blade has 5 slots for 2.5-inch SAS or SATA hard disk modules and occupies one slot in the PRIMERGY BX600 S3 basic unit.

You can connect one or two SX650 storage blades to one BX620 S4 server blade. A second SX650 storage blade connected to a BX620 S4 server blade must be configured for this purpose, see page 19.

The SX650 Storage Blade is connected to its associated server blade with a special SAS cable.

1.1 Concept and target groups for this manual

This operating manual describes how to install, set up and operate your server.

This operating manual is intended for those responsible for installing the hardware and ensuring that the system runs smoothly. It contains all the information you need to put your PRIMERGYSX650 into operation.

To understand the various expansion options, you will need to be familiar with the fields of hardware and data transmission and you will require a basic knowledge of the underlying operating system.

1.2 Documentation overview

More information on your PRIMERGY SX650 Storage Blade can be found in the following documents:

– "Safety notes and other important information" manual

– "Warranty" manual

– "Returning used devices" manual

> **i** PRIMERGY manuals are available in PDF format on the ServerBooks DVD. The ServerBooks DVD is part of the ServerView Suite supplied with every server.
>
> The PDF files of the manuals can also be downloaded free of charge from the Internet. The overview page showing the online documentation available on the Internet can be found using the URL: *http://manuals.fujitsu-siemens.com*. The PRIMERGY server documentation can be accessed using the *Industry standard servers* navigation option.
>
> If you need a replacement copy of the ServerBooks DVD, send the details of your server to the following e-mail address: *Reklamat-PC-LOG@fujitsu-siemens.com*

1.3   Notational conventions

The following notational conventions are used in this manual:

Text in italics	indicates commands or menu items.
"Quotation marks"	indicate names of chapters and terms that are being emphasized.
►	describes activities that must be performed in the order shown.
⚠ **CAUTION!**	pay particular attention to texts marked with this symbol. Failure to observe this warning may endanger your life, destroy the system or lead to the loss of data.
i	indicates additional information, notes and tips.

1.4 Technical Data

electrical data

Energy consumption	110 W (full configuration)
Thermal dissipation	110 W

Compliance with regulations and standards

Product safety and ergonomics	IEC 60950-1 / EN 60950-1, UL/CSA 60950-1, CNS 14336 / GB 4943 / EN 50371
Electromagnetic compatibility	FCC class A
	CNS 13438 class A; VCCI class A
	AS/NZS CISPR 22 class A / GB 9254 class A
	GB 17625
Interference emissions	EN 55022 class A
Harmonic current	EN 61000-3-2
Flicker	EN 61000-3-3
Interference immunity	EN 55024, EN 300386
CE marking to EU directives	Low Voltage Directive 2006/95/EC
	(Product Safety)
	Electromagnetic Compatibility 2004/108/EC

Certification

Product safety	
Global	CB
Europe	ENEC
Germany	GS, CE
USA/Canada	CSA_{US} / CSA_C
Japan	VCCI
China/Taiwan	BSMI

Mechanical specifications

Width	286 mm
Depth	470 mm (520 mm incl. handles and plugs)
Height	43 mm (1 slot in basic unit)

Weight

Max. ca. 9,2 (Ausbau-abhängig) (depending on the configuration).

Ambient conditions

Environment class 3K2 Environment class 2K2	EN 60721 / IEC 721 Part 3-3 EN 60721 / IEC 721 Part 3-2
Temperature:	
Operation (3K2)	5°C .... 35°C
Transport (2K2)	-20°C .... 60°C
Humidity	10% 85%

Condensation during operation must be avoided!

2 Important notes

This chapter provides safety instructions which you must observe when handling your storage blade.

2.1 Notes on safety

The following safety instructions are also provided in the manual "Safety notes and other important information".

This device complies with the relevant safety regulations for IT equipment. If you have any questions about whether you can install the server in the intended environment, please contact your sales outlet or our customer service team.

CAUTION!

- The actions described in this manual should only be performed by technical specialists.

- Equipment repairs should only be performed by service staff.

- Any failure to observe the guidelines in this manual, and any unauthorized opening or improper repairs could endanger the user (through electric shock, fire hazards) or damage the equipment.

- Please note that any unauthorized opening of the server will void the warranty and exempt the manufacturer from all liability.

- During installation and before operating the device, observe the instructions on environmental conditions for your device (see section "Technical Data" on page 8).

- If the device is brought in from a cold environment, condensation may form on both the inside and outside of the machine.

  Before operating the device, wait until it is absolutely dry and has reached approximately the same temperature as the installation site. Failure to observe these guidelines could cause damage to the device.

- Transport the device only in its original packaging or in packaging which protects it from knocks and jolts.

CAUTION!

● Check that the rated voltage of all devices is the same as the local mains voltage.

● Do not connect or disconnect any data transmission cables during a thunderstorm (lightning hazard).

● Make sure that no objects (such as bracelets or paper clips etc.) fall into or liquids spill into the device (risk of electric shock or short circuit).

● Proper operation of the system (in accordance with IEC60950-1/EN60950-1) is only guaranteed if slot covers are installed in all vacant slots and/or dummies in all vacant bays and the housing cover is fitted (cooling, fire protection, RFI suppression).

2.2   ESD label

Modules with electrostatic-sensitive components

Systems and components that might be damaged by electrostatic discharge (ESD) are marked with the following label:
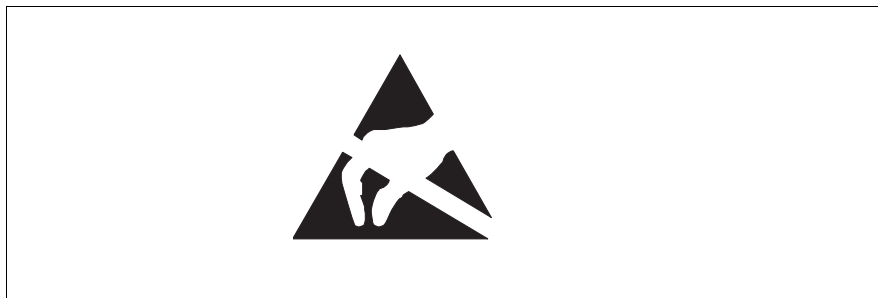

Figure 2: ESD label

When you handle components fitted with ESDs, you must observe the following points under all circumstances:

● Remove the power plug before installing or removing components containing ESDs.

● You must always discharge yourself of static charges (e.g. by touching a grounded object) before working.

● The equipment and tools you use must be free of static charges.

● Only touch the components at the positions highlighted in green (touch points).

● Do not touch any exposed pins or conductors on a component.

● Use a grounding cable designed for this purpose to connect yourself to the system unit as you install components.

● Place all components on a static-safe base.

| i | You will find a detailed description for handling ESD components in the relevant European or international standards (DIN EN 61340-5-1, ANSI/ESD S20.20). |

2.3   CE conformity
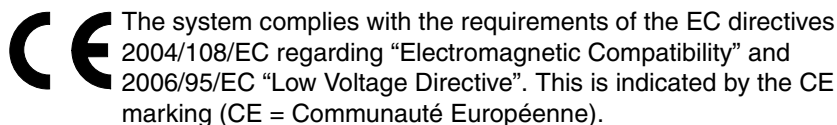
The system complies with the requirements of the EC directives 2004/108/EC regarding "Electromagnetic Compatibility" and 2006/95/EC "Low Voltage Directive". This is indicated by the CE marking (CE = Communauté Européenne).

2.4   RFI suppression

All other equipment which is connected to this product must also have radio noise suppression in accordance with EC directive 89/336/EEC.

Products which meet this requirement are accompanied by a certificate to that effect issued by the manufacturer and/or bear the CE mark. Products which do not meet this requirement may only be operated with the special permission of the German Federal Approvals Office for Telecommunications (BZT).

2.5   Notes on transport

Transport the storage blade only in its original packaging or in packaging which protects it from knocks and jolts.

Only unpack the storage blade at the place where you want to set it up.

2.6   Environmental protection

Environmentally-friendly product design and development

This product has been designed in accordance with the Fujitsu Siemens Computers standard for "environmentally friendly product design and development". This means that key factors such as durability, selection and labeling of materials, emissions, packaging, ease of dismantling and recycling have been taken into account.

This saves resources and thus reduces the harm done to the environment.

Energy-saving information

Devices that do not need to be constantly switched on should be switched off until they are needed as well as during long breaks and after completion of work.

Packaging information

Do not throw away the packaging. You may need it later for transporting the system. If possible, the equipment should only be transported in its original packaging.

Information on handling consumables

Please dispose of printer consumables and batteries in accordance with the applicable national regulations.

In accordance with EU directives, batteries must not be disposed of with unsorted domestic waste. They can be returned free of charge to the manufacturer, dealer or an authorized agent for recycling or disposal.

All batteries containing pollutants are marked with a symbol (a crossed-out garbage can). They are also marked with the chemical symbol for the heavy metal that causes them to be categorized as containing pollutants:

Cd Cadmium
Hg Mercury
Pb Lead

Labels on plastic casing parts

Please avoid sticking your own labels on plastic parts wherever possible, since this makes it difficult to recycle them.

Return, recycling and disposal

The device must not be disposed of with domestic waste. This device is labeled in compliance with European directive 2002/96/EG on waste electrical and electronic equipment (WEEE).

This directive sets the framework for returning and recycling used equipment and is valid across the EU. When returning your used device, please use the return and collection systems available to you. Further information can be found at *www.fujitsu-siemens.com/recycling*.

Details regarding the return and recycling of devices and consumables within Europe can also be found in the "Returning used devices" manual, via your local Fujitsu Siemens Computers branch or from our recycling center in Paderborn:

Fujitsu Siemens Computers GmbH
Recycling Center
D-33106 PaderbornGermany

Tel.   +49 5251 8 18010

Fax   +49 5251 8 18015

3 Installation

⚠ **CAUTION!**

● Follow the safety instructions in chapter chapter "Important notes" on page 11.

● The storage blade must not be exposed to extreme environmental conditions (see section "Technical Data" on page 8). Protect the storage blade from dust, humidity and heat.

● The storage blade must be acclimatized to its operating environment for the time specified in the table before you operate it.

Temperature difference (°C)	Minimum acclimatization time (hours)
5	3
10	5
15	7
20	8
25	9
30	10

Table 1: Acclimatization times

In table "Acclimatization times", temperature difference refers to the difference between the temperature of the operating environment and the temperature to which the storage blade was previously exposed (outside, transport or storage temperature).

3.1 Installation procedure

► Unpacking the storage blade (see next section "Unpacking the storage blade").

  The following step is only necessary if you want to connect two storage blades to one server blade:

► Configuring a second storage blade (see page 19).

► Shutting down the associated server blade (see section "Shutting down the server blade" on page 21).

► section "Installing the storage blade in the BX600 S3 basic unit or removing it" on page 22Installing the storage blade in the basic unit

► Connecting the cables of the storage blade (see next section "Installing the storage blade in the BX600 S3 basic unit or removing it" on page 25).

► Starting up the storage blade (see section "Starting up the storage blade" on page 30 in the chapter "Installation and operation").

3.2 Unpacking the storage blade

⚠ **CAUTION!**
  Make sure you observe the safety notes in the chapter "Important notes".

Keep the original packaging of the storage blade, as you may need it for future transport.

► Unpack all the individual parts.

► Check the delivery for damage sustained during transport.

► Check that the delivery corresponds to the specifications in the delivery note.

► Check whether all the necessary details have been entered on the first page of the guarantee booklet.

If the delivery is damaged or does not match the delivery note, contact your supplier immediately!

3.3   Configuring a Second Storage Blade

⚠ **CAUTION!**

Make sure you observe the safety notes in the chapter "Important notes".

You can connect two SX650 storage blades to one BX620 S4 server blade. For the hard disk drives of both storage blades to be correctly addressed by the server blade, the SAS ID for the second storage blade must be increased by 1. This is done via a jumper setting on the SAS expander board of the second storage blade.

This section describes how to make this setting. You will need to open the housing of the second storage blade.
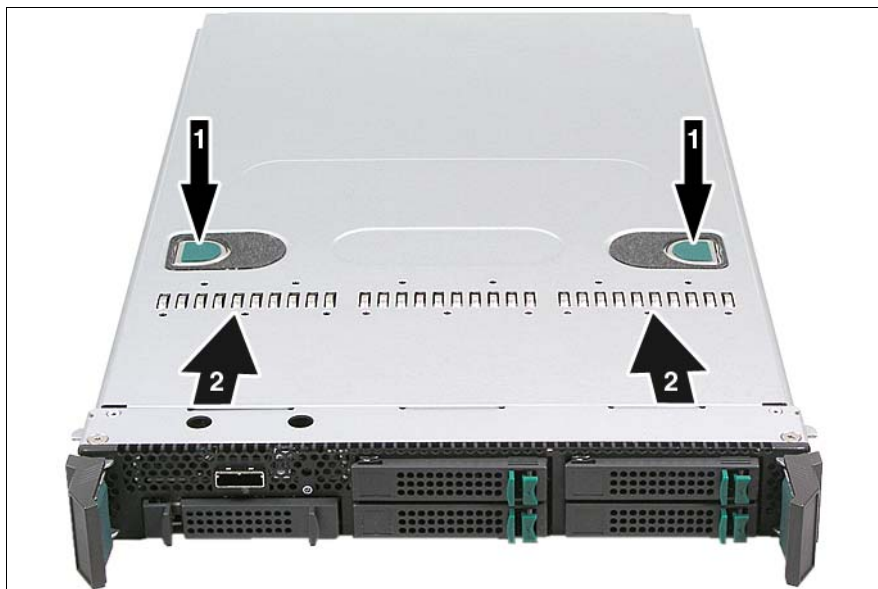
Figure 3: Opening the storage blade

▶ Press down the two top cover release latches (1) simultaneously to disengage the locking mechanism of the cover plate and slide the cover plate backward in the direction of the arrow (2).

▶ Take off the cover plate.
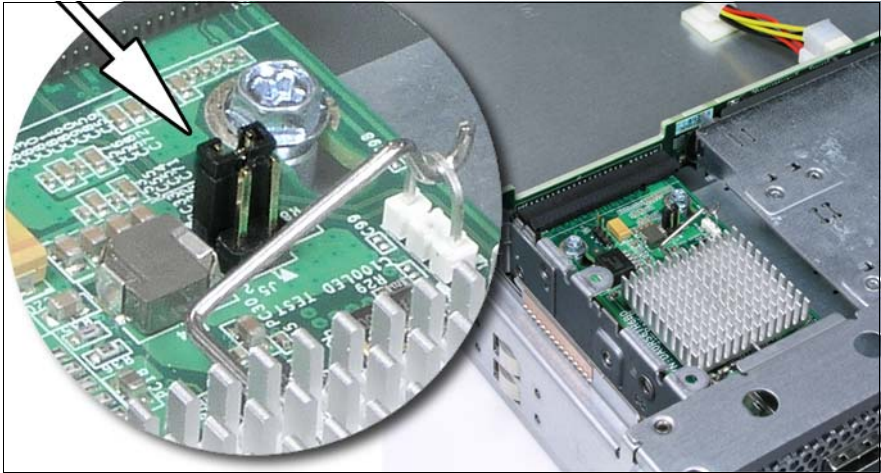
The server blade components are now freely accessible.

Figure 4: Plupping the jumper

► Set the jumper to the position shown in the figure above, so that pins 1 and 2 of jumper block J4 are connected.

> **i** In the default setting, the jumper is set via a single pin.
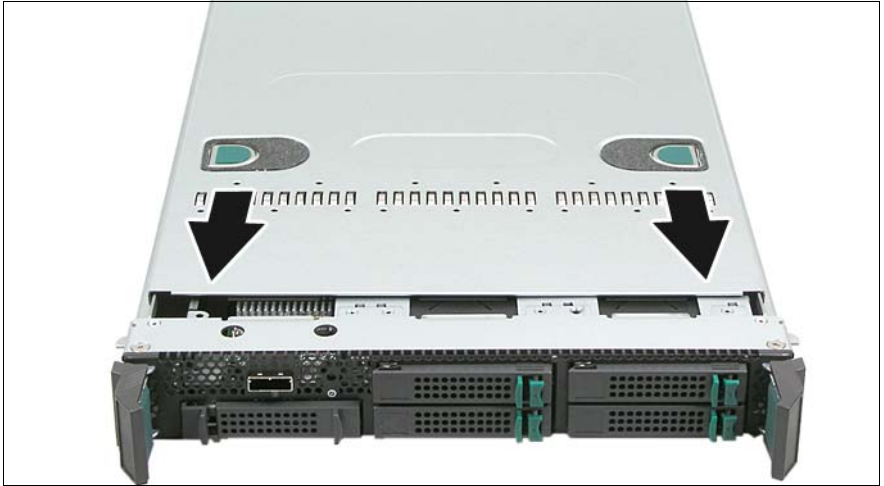
Close the housing of the second storage blade now.

Figure 5: Closing the storage blade

► Place the cover plate evenly on the server blade chassis, leaving a gap of approx. 1-2 cm (1 inch) from the front frame of the chassis.

► Slide the cover plate forward in the direction of the arrows until it stops.

3.4   Shutting down the server blade

Before installing SX650 Storage Blades in the BX600 S3 basic unit, you must shut down the associated server blade. To do this, use the Web interface of the BX600 S3 management blade, see the manual "PRIMERGY BX Blade Server Systems - RemoteView Management Blade".

3.5 Installing the storage blade in the BX600 S3 basic unit or removing it

⚠ **CAUTION!**

Make sure you observe the safety notes in the chapter "Important notes" on page 11.
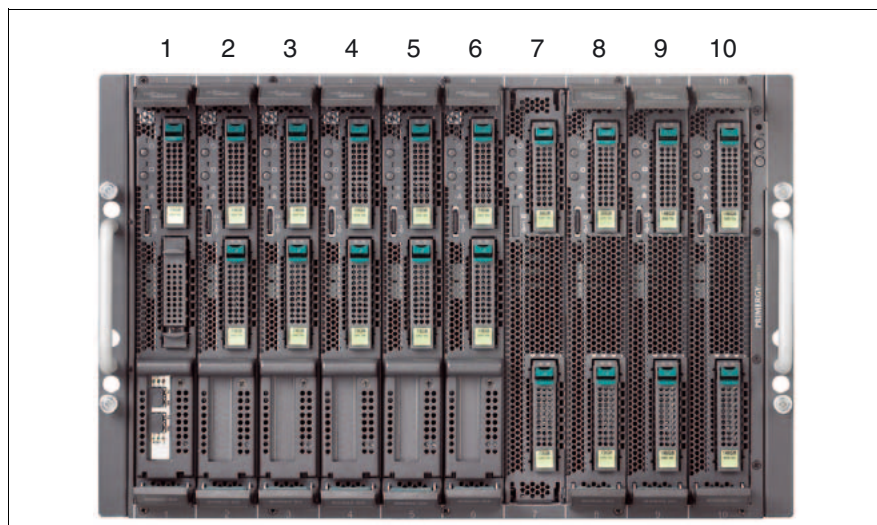
Fitting rules

Figure 6: Numbering of the server blade slots

The SX650 Storage Blades must be installed to the immediate right of the associated server blade. So if the associated server blade is installed in slot **n**, you must install the first storage blade in slot **n+1** and the second storage blade in slot **n+2**.

Removing the dummy module

Any unused slots in the basic unit are fitted with appropriate dummy modules to comply with electromagnetic compatibility (EMC) regulations and to ensure sufficient cooling of the system components.

To add a storage blade, you must first remove the dummy module from the relevant slot.

Figure 7: Removing the dummy module

► Undo the locking mechanism of the handles by pressing the green touch points on the inside of the two handles (1). This undoes the locking handles of the dummy module.

► Swivel the top handle upward and the bottom handle downward (2) simultaneously until the locking mechanism of the dummy module disengages and releases the module.

► Pull the dummy module completely out of the slot (3).

⚠ **CAUTION!**

Keep the dummy module for future use. If a storage blade or server blade is removed again and not replaced with a new one, the dummy module must be reinstalled because of cooling, EMC regulations, and fire protection.

You install the dummy module in the same way as the storage blade. This is described in the following section.

Installing a storage blade

⚠ **CAUTION!**

Make sure you observe the safety instructions and note the information in section "ESD label" on page 13.

Figure 8: Installing a storage blade

ℹ Make sure you install the storage blade in the correct direction. The SAS connector (A) must be in the bottom part of the storage blade.

► Undo the locking mechanism of the storage blade handles by first pressing the green inside touch points of the two handles (1).

► Then swivel the locking handles outward (2) into the unlocked position.

► Holding the locking handles in the unlocked position, push the storage blade as far as possible into the slot.

► Press the locking handles inwards until the locking mechanism of the storage blade engages fully.
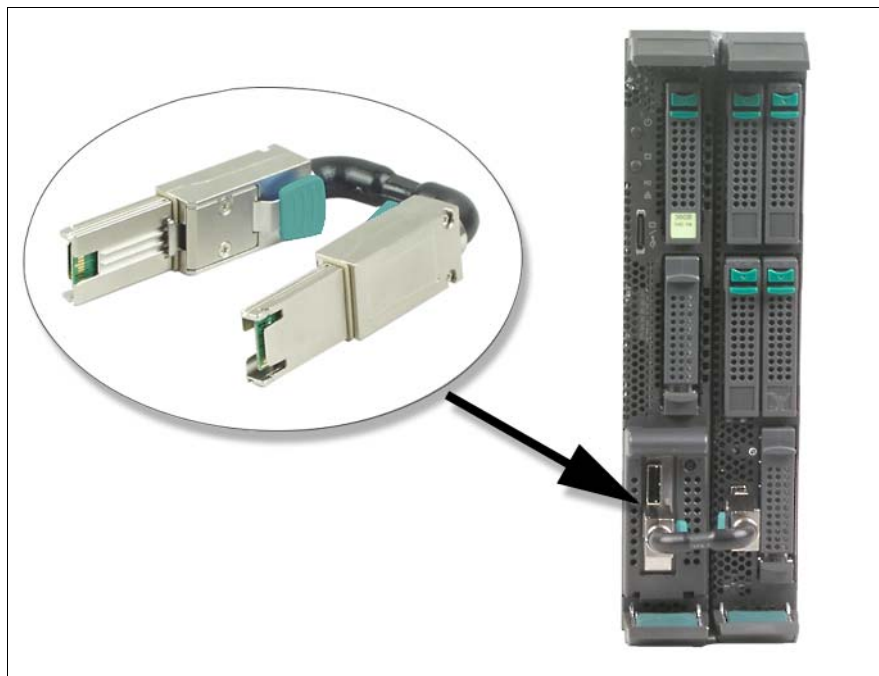
Connecting the first storage blade

Figure 9: Connecting the storage blade

► Connect the bottom SAS connector of the server blade and the SAS connector of the storage blade using the supplied short SAS cable.

Connecting the Second Storage Blade

⚠️ **CAUTION!**

Make sure that the SAS ID for the storage blade is set correctly, see "Configuring a Second Storage Blade" on page 19.
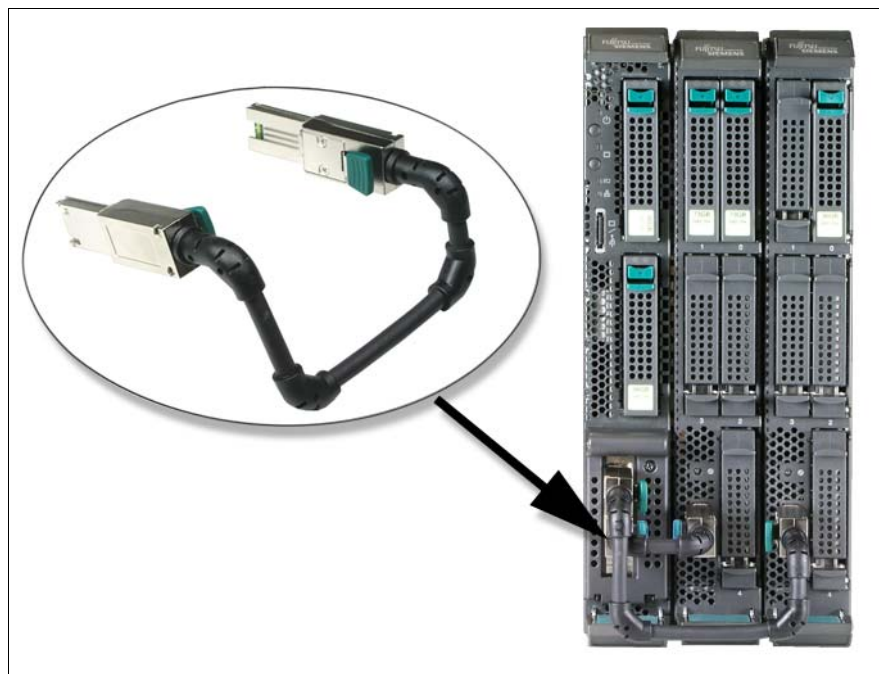

Figure 10: Connecting the second storage blade

► Connect the upper BX620 S4 SAS connector to the SAS connector of the second storage blade using the supplied longer SAS cable.

Removing a storage blade

> ⚠️ **CAUTION!**
>
> If you remove a storage blade and do not install a new blade in its place, you must install a dummy module in the empty slot.

▶ Make sure the server blade to which the storage blade is connected is switched off.

▶ Remove the miniSAS cable from the SAS connectors of the storage blade and the server blade (see figure 9).

▶ Remove the storage blade from the basic unit in the same way as you would remove a dummy module (see "Removing the dummy module" on page 22).

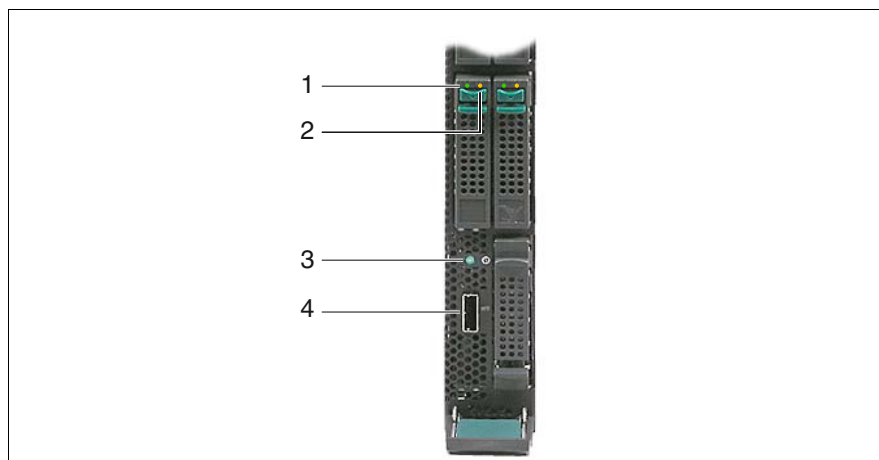# 4   Installation and operation

4.1   Control panel

Figure 11: Control panel

LEDs and connectors

1	**Hard disk access (green LED)**	
	Dark:	Hard disk drive not active.
	Glows green:	Hard disk drive active.
2	**Hard disk drive indicator (orange LED)**	
	Dark:	No error
	Glows orange:	Server blade is on and hard disk drive has an error.
	Flashes slowly (1Hz)	Reconstruction (RAID message)
	Flashes quickly (3Hz)	Indicates hard disk localization (RAID message)

3	**Power indicator (green LED)**	
⏻	Glows:	The connected server blade is running.
	Dark:	The connected server blade is not running.
4	**SAS connector**	

4.2   Starting up the storage blade

Make sure the storage blade is installed in the basic unit and connected to the associated server blade (see sections "Installing the storage blade in the BX600 S3 basic unit or removing it" on page 22 and "Connecting the first storage blade" on page 25).

► Start the server blade that is connected to the storage blade either via the Web interface of the management blade or by pressing the On/Off button on the control panel of the server blade.

As soon as the associated server blade is in operation, the power indicator of the storage blade lights up. You can now configure the hard disk drives of the storage blade using the ServerView RAID Manager. For more information, see the user manual "ServerView RAID Version 2.3".

i	You start up two storage blades on one server blade in the same way.

5 Hot-plug components

This chapter describes how to replace or add hot-plug hard disk drives in the PRIMERGYSX650 Storage Blade.

You can install up to five 2.5-inch SAS or SATA hard disk drives in the PRIMERGY SX650 Storage Blade.

i You cannot operate both SAS and SATA hard disk drives together in the same storage blade.

Fitting rules

The bays for the hard disk modules must be fitted in the order shown in the following figure. If you install hard disk modules with different capacities, install the modules in order of ascending capacity (0-4).

Figure 12: Fitting order for hard disk modules

5.1 hot-plug hard disk drives

The hard disk drives that can be ordered for the SX650 Storage Blade come mounted in a module frame that allows you to replace defective drives and add new ones while the system is running. The hard disk drive and the module frame are together referred to as the hard disk module.

⚠ **CAUTION!**

● A hard disk should only be removed from the hard disk module by a service technician.

● All hard disk modules (drives) must be clearly labeled so that you can replace them in their original bays should you remove them. If you mix up the hard disks you might lose existing data.

⚠️ **CAUTION!**

● "Hot plugging" is only possible in conjunction with a corresponding RAID configuration.

   For more information on RAID configurations or RAID levels, see the RAID controller documentation.
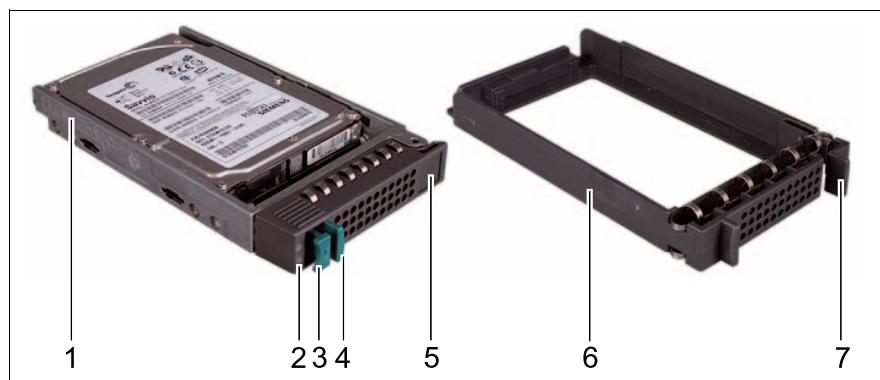

Figure 13: 2.5-inch hard disk module and dummy module

1	Hard disk module (carrier with installed hard disk drive)
2	Indicators HDD busy (LED green) HDD fault (LED orange) Description see table on page 29 in section "Control panel".
3	Handle for engaging and disengaging the hard disk module
4	Locking button
5	Indentation for a sticker with the current drive identifier
6	Dummy module
7	Locking tabs of the dummy module

5.2   Handling hard disk drives and HDD modules

Hard disk drives incorporated in the HDD modules are highly sensitive electro-magnetic devices and must be handled with great care. Incorrect handling can cause partial or total failure of the hard disk drives. These failures can result in data errors and to a loss of data or to total corruption of the hard disk drive.

Observe the following rules to prevent such problems occurring:

● Only store and transport HDD modules within the limits stipulated in the specification.

● When transporting HDD modules (even over short distances), always use the original packaging (ESD label).

● Never expose HDD modules to a temperature shock. Avoid the formation of condensation inside and on the outside of the hard disk drive.

⚠ **CAUTION!**

The HDD module must be acclimatized in its operating environment for an acclimatization time before it is started up for the first time.

Temperature difference (°C) (operating environment/ outside)	Minimum acclimatization time (hours)
5	3
10	5
15	7
20	8
25	9
30	10

Table 2: Acclimatization times for HDD modules

● Always set the HDD module down carefully, with the large surface facing downwards to prevent it from tipping over.

5.3   Removing/Installing the dummy module

Free slots are provided with dummy modules. Remove the dummy module before installing an additional HDD module.
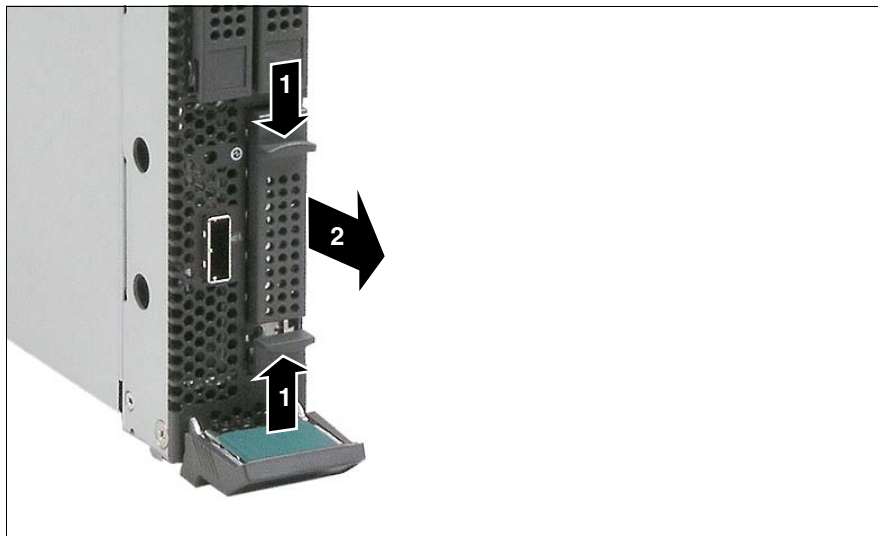

Figure 14: Removing the dummy module

► Press both tabs on the dummy module together until the locking mechanism disengages (1).

► Pull the dummy module out of the slot (2).

To install a dummy module, follow the same procedure in reverse order.

⚠ **CAUTION!**

Store the dummy module in a safe place. If you have removed an HDD module and do not install a new one in its place, put the dummy module back in its place for cooling, to comply with EMC regulations (regulations regarding electromagnetic compatibility), and for protection against fire. Ensure that the dummy module engages correctly in the slot.

5.4   Removing a hard disk module

Unlocking the hard disk module

Figure 15: Unlocking a 2.5-inch hard disk module

–   Press the green locking lever to the left (1) and swivel the locking handhold to the front (2).

Installing a hard disk module

Figure 16: Installing a hard disk module

► Carefully push the hard disk module into the empty bay as far as it will go.

► Swivel the handle fully round in the direction of the arrow until the locking mechanism engages.

Removing the HDD module

⚠ **CAUTION!**

● Only remove a HDD module during operation if the drive is not currently being accessed. Observe the control LEDs for the corresponding HDD modules (see "Control panel" on page 29).

● Under no circumstances should you remove an HDD module while the system is in operation if you are not sure whether the hard disk drive is operated by a RAID controller and belongs to a disk array which is operating at RAID level 1.

An HDD module can only be replaced during operation in conjunction with a corresponding RAID configuration.

● All HDD modules (drives) must be uniquely identified so that they can be reinstalled in their original mounting locations later. If this is not done, existing data can be lost.

If you want to remove an HDD module during operation, proceed as follows:

► If you want to remove a HDD module that is not defective, the drive must be first set to offline via the software (RAID controller configuration software).

► Unlock the HDD module as described in section "Unlocking the hard disk module" on page 35.

► Pull the HDD module out a few centimeters.

► Wait for at least 60 seconds.

> | **i** | This period is necessary for the RAID controller to recognize that an HDD module has been removed and for the hard disk drive to come to a stop.

► Pull the HDD module out completely.

► Install the new HDD module, as described in "Unlocking the hard disk module" on page 35 and "Installing a hard disk module" on page 36.

> ⚠ **CAUTION!**
>
> If you have removed an HDD module and do not install a new one in its place, put the dummy module back in its place for cooling, to comply with EMC regulations (regulations regarding electromagnetic compatibility), and for protection against fire. Ensure that the dummy module engages correctly in the slot.

6 Troubleshooting and tips

⚠️ **CAUTION!**

Make sure you observe the safety notes in the chapter "Important notes" on page 11.

If the power indicator of the storage blade (see figure 11 on page 29) does not light up after you have switched on the associated server blade, note the following:

All handling errors that may occur while operating server blades in the PRIMERGY BX600 S3 basic unit are described in the operating manual for the basic unit.

If a fault occurs, try to correct it as described:

– in the chapter "Troubleshooting and tips" in the operating manual for your basic unit.
– in the chapters for the installed components,
– in the documentation for the connected devices
– in the help systems of the individual programs used.

If you do not manage to correct the problem, proceed as follows:

► Make a note of the steps you have taken and the situation in which the fault occurred. Also make a note of the error messages displayed.

► Switch off the defective server blade or the system.

► Contact customer service.

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Information on this document

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