# System Board D2529
# for TX300 S4

Technical Manual

Edition November 2007

# Comments… Suggestions… Corrections…

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## 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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# Contents

# 1 Introduction

This technical manual describes the system board D2529, which can be equipped with one or two Intel® processors.

You will find further information in the BIOS description.

Further information about drivers is provided in the readme files on the hard disk, on the supplied "ServerStart" or "Update" CDs.

**Notational conventions**

The meanings of the symbols and fonts used in this manual are as follows:

| *italics* | indicates commands, menu items, file and path names or software programs |
|---|---|
| `fixed font` | indicate system output on the monitor |
| `semi-bold fixed font` | indicates values to be entered through the keyboard |
| Key symbol | indicates keys according to their representation on the keyboard |
| | If capital letters are to be entered explicitly, then the Shift key is shown, e.g. SHIFT - A for A. |
| | If two keys need to be pressed at the same time, then this is shown by placing a hyphen between the two key symbols. |
| "quotation marks" | indicates names and terms that are being empha-sized. |
| ▶ | indicates an operation that to be performed |
| ⚠ CAUTION! | indicates warnings, which, if ignored, will endanger your health, destroy the system or lead to the loss of data. |
| i | indicates additional information, notes and tips |

Table 1: Notational conventions

# 2 Important notes

In this chapter you will find essential information regarding safety when working with your server.

⚠ **CAUTION!**

With the system board installed you must open the system to access the system board. How to access the system board of your system is described in the appropriate service supplement.

When handling the system board, refer to the specific notes on safety in the operating manual and/or service supplement for the respective server.

## 2.1 Notes on safety

⚠ **CAUTION!**

● The actions described in these instructions should only be performed by authorized, qualified personnel. Equipment repairs should only be performed by qualified staff. Any failure to observe the guidelines in this manual, and any unauthorized openings and improper repairs could expose the user to risks (electric shock, fire hazards) and could also damage the equipment. Please note that any unauthorized openings of the device will result in the invalidation of the warranty and exclusion from all liability.

● Transport the device only in the antistatic original packaging or in packaging that protects it from knocks and jolts.

● Only install expansions that are allowed for the system board. If you install other expansions, you may damage the requirements and rules governing safety and electromagnetic compatibility or your system. Information on which system expansions are suitable can be obtained from the customer service centre or your sales outlet.

● The warranty expires if the device is damaged during the installation or replacement of system expansions.

⚠ ● Components can become very hot during operation. Ensure you do not touch components when making extensions to the system board. There is a danger of burns!.

● Transmission lines to peripheral devices must be adequately shielded.

● To the LAN wiring the requirements apply in accordance with the standards EN 50173 and EN 50174-1/2. As minimum requirement the use of a protected LAN line of category 5 for 10/100 MBps Ethernet, and/or of category 5e for Gigabit Ethernet is considered. The requirements of the specification ISO/IEC 11801 are to be considered.

● Never connect or disconnect data transmission lines during a storm (lightning hazard).

**Batteries**

⚠ **CAUTION!**

● Incorrect replacement of lithium battery may lead to a risk of explosion. The batteries may only be replaced with identical batteries or with a type recommended by the manufacturer.

It is essential to observe the instructions in chapter "Replacing the lithium battery".

**Modules with electrostatic-sensitive components**

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



Figure 1: ESD label

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

● 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.

● Remove the power plug from the power socket before inserting or removing boards containing ESDs.

● Always hold boards with ESDs by their edges.

● Never touch pins or conductors on boards fitted with ESDs.

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

● 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 (EN 61340-5-1, ANSI/ESD S20.20).

**Notes about boards**

● During installation/deinstallation of the system board, observe the specific instructions described in the service manual for the server.

● Remove the plug from the mains outlet so that system and system board are totally disconnected from the mains voltage.

● To prevent damage to the system board, the components and conductors on it, please take great care when you insert or remove boards. Take great care to ensure that extension boards are slotted in straight, without damaging components or conductors on the system board, or any other components, for example EMI spring contacts.

● Be careful with the locking mechanisms (catches, centring pins etc.) when you replace the system board or components on it, for example memory modules or processors.

● Never use sharp objects (screwdrivers) for leverage.

## 2.2    CE Certificate

C E    The shipped version of this board complies with the requirements of the EEC directive 89/336/EEC "Electromagnetic compatibility".

Compliance was tested in a typical PRIMERGY configuration.

# 2.3     Environmental Protection

**Environmentally friendly product design and development**

This product has been designed in accordance with standards for "environmentally friendly product design and development". This means that the designers have taken into account important criteria such as durability, selection of materials and coding, emissions, packaging, the ease with which the product can be dismantled and the extent to which it can be recycled.

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

**Notes on saving energy**

Devices that do not have to be on permanently should not be switched on until they need to be used and should be switched off during long breaks and on completion of work.

**Notes on packaging**

Please do not throw away the packaging. We recommend that you do not throw away the original packaging in case you need it later for transporting.

**Notes on dealing with consumables**

Please dispose batteries in accordance with local government regulations.

Do not throw batteries and accumulators into the household waste. They must be disposed of in accordance with local regulations concerning special waste.

All batteries containing pollutants are marked with a symbol (a crossed-out rubbish bin on wheels). In addition, the marking is provided with the chemical symbol of the heavy metal decisive for the classification as a pollutant:

Cd Cadmium
Hg Mercury
Pb Lead

**Notes on labeling plastic housing parts**

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

## Returning, recycling and disposal

The device may not be disposed of with household rubbish. This appliance is labelled in accordance with European Directive 2002/96/EC concerning used electrical and electronic appliances (waste electrical and electronic equipment - WEEE).
The guideline determines the framework for the return and recycling of used appliances as applicable throughout the EU. To return your used device, please use the return and collection systems available to you. You will find further information on this at *www.fujitsu-siemens.com/recycling*.

For details on returning and reuse of devices and consumables within Europe, refer to the "Returning used devices" manual, or contact your Fujitsu Siemens Computers branch office/subsidiary or our recycling centre in Paderborn:

Fujitsu Siemens Computers
Recycling Center
D-33106 Paderborn

Tel.    +49 5251 8 18010

Fax    +49 5251 8 18015

# 3 Features

## 3.1 Overview

**Processors**

– 1 or 2 dual or quad core Intel$^®$ Xeon™ processors
– 2 processor sockets LGA771 for dual core Intel$^®$ Xeon™ processors
– 1x6, 2x6, 2x4 or 4 MB Second-Level-Cache (on-die unified, 64 byte cacheline size)
– 32 KB L1 Cache (on-die, data per core)
– 32 KB L1 Cache (on-die, instruction per core)
– 2 x 266 MHz or 333 MHz data bus (equals FSB 1066 or 1333: quadruple data rate (or quad pumping) delivers 4 bits of data per clock cycle)
– 2 VRM 11.0 onboard (EVRD)

**Main memory**

– 2 sots for memory riser cards with 8 PCI slots each
– FBD PC2-4200F or FDB PC2-5300F Fully Buffered DIMM memory modules with 512 MB, 1 Gbyte, 2 Gbyte and 4 Gbyte
– Maximum 64 Gbyte
– Minimum 1 Gbyte
– Maximum 4x8 Gbyte/s bandwidth
– Supports 4 FBD memory channels
– ECC multiple bit error detection and single bit error correction
– Memory scrubbing function
– Single Device Data Correction (SDDC) function (Chipkill™)
– Mirroring
– Sparing

**Chips on the system board**

– Intel$^®$ Blackford chip set (Intel 5000P chipset)
– Single-channel Gigabit LAN controller (Broadcom 5708C)
– Super I/O controller (SMSC 47M107)
– Flash EPROM for:
  – local BIOS; flashable via bootable USB device, LAN or optional floppy disk
– SMSC8700 Fast Ethernet RMII Phy
– iRMC S2 with integrated VGA graphic controller

– ADM7462 thermal system management controller

**Internal connectors**

– 1 floppy disk connector (26 pin)
– 1 USB connector
– 3 Serial ATA
– Power connector 24 pin (12V, -12V, 5V, 3.3V and 5V auxiliary)
– Dual 12V power connector
– Single 12V power connector
– PC98 connector
– Front panel
– dual USB type C (for USB 2.0 port on front side)
– 2 USB for streamer
– 4 fan direct connectors
– 1 connector for 2 CPU fans
– Intrusion connector
– 2 slots for memory riser cards
– 1 SMB connector
– 1 HD LED activity connector

**External connectors**

– 2 serial ports (COM1, COM2)
– 1 parallel port (optional)
– 2 PS/2 interfaces for keyboard and mouse
– 2 UHCI USB 2.0 ports with 480 Mbits/s (rear side) combined with
– 1 RJ45 LAN connector (dedicated service LAN)
– 1 VGA port
– 1 dual RJ45 LAN connector

**PCI slots**

– 1 PCI-X 1.0b (64 Bit / 133 MHz)
– 2 PCI-Express 1.0a (2 Gbyte/s bandwidth)
– 4 PCI-Express 1.0a, alternatively configurable as 4x2 Gbyte/s or
2x4 Gbyte/s bandwidth

**BIOS features**

– Phoenix System-BIOS V 4.06
– SMBIOS 2.4 (DMI)
– MultiProcessor Specification 1.4
– Server Hardware Design Guide
– WfM
– ACPI support
– USB keyboard/mouse
– boot possible from:

  – floppy disk drive (USB, Standard)
  – hard disk (SATA, SAS)
  – CD/DVD (SATA)
  – LAN (PXE, iSCSI)
– console redirection support
– OEM logo
– CPU, memory disable
– spare memory support

**Environmental protection**

3V-Battery in holder for recycling

**Form factor**

– 290 x 460 mm

– ACPI 2.0, OnNow, PCI-X 1.0b, PCI-Express 1.0a, LPC 1.1, WfM 2.0,
  SHDG 3.0, MPS 1.4, IPMI 2.0 and PCI Express Card
  Electromechanical Specification Rev. 1.0, USB2.0, SATAII 1.0

**CSS (Customer Self Service)**

This system board supports the CSS functionality. You will find a description of
CSS functionality in the operating manual of your server.

**TPM (option)**

The system board is optional equipped with a TPM (Trusted Platform Module)
by the manufacturer. This module enables programs from third party manufac-
turers to store key information (e.g. drive encryption using Windows Bitlocker
Drive Encryption).

The TPM is activated via the BIOS system (for more information, refer to the Fujitsu Siemens Computers BIOS manual).

⚠ **CAUTION!**

– When using the TPM, note the program descriptions provided by the third party manufacturers.

– You must also create a backup of the TPM content. To do this, follow the third party manufacturer's instructions. Without this backup, if the TPM or the system board is faulty you will not be able to access your data.

– If a failure occurs, please inform your service about the TPM activation before it takes any action, and be prepared to provide them with your backup copies of the TPM content.

# 3.2    Main memory

The system board supports up to 64 Gbyte main memory. Two slots for riser cards with 8 FBD slots each are available . Each memory bank can be populated with two 512 Mbyte, 1 Gbyte, 2 Gbyte or 4 Gbyte FBD PC2-4200F or FDB PC2-5300F fully buffered DIMM memory modules.

ECC with memory scrubbing and with the Single Device Data Correction (SDDC) function is supported.

> **i**   You will find the descriptions how to install memory modules in the Options Guide of your server.

**Slots for riser cards**
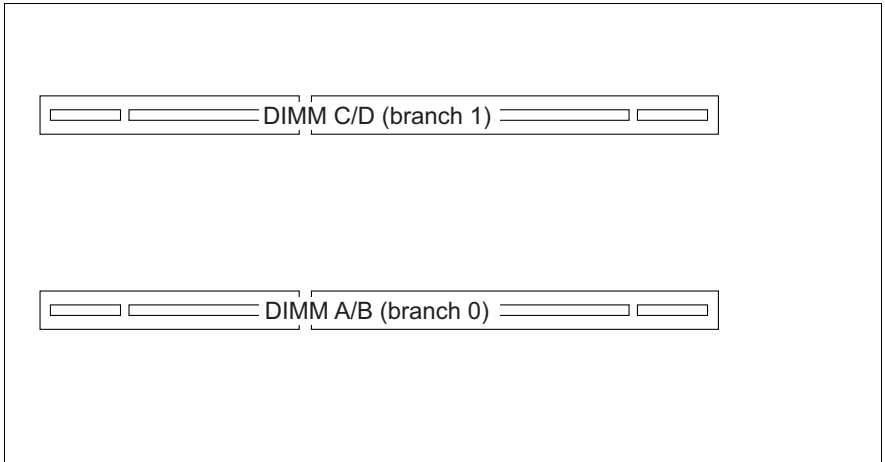


Figure 2: Slots for the riser cards

If only one riser card is occupied slot DIMM A/B will be populated.

## Module population



Figure 3: Layout of the memory modules

– The memory banks have to be populated sequentially top down in pairs of FBD PC2-4200F oder FBD PC2-5300 Fully Buffered DIMM memory modules.

– Each pair consists of identical memory modules.

There are three modes of operation for the main memory:

– Non-mirrored mode

– Mirrored mode

– Sparing mode

Depending on the mode of operation there are different population requirements.

**Non-mirrored mode**

Using **one** riser card the module population is as follows:

1A + 1B (minimum configuration) - 2A + 2B - 3A + 3B - 4A + 4B
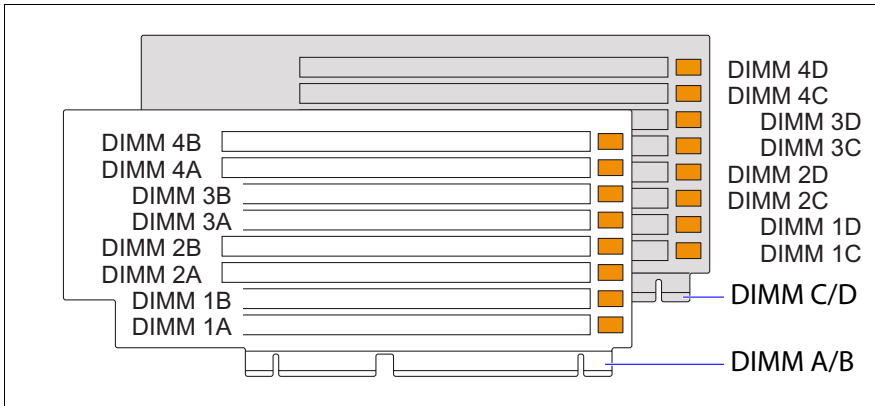
Using **two** riser cards the population can be alternating (higher performance) or consecutive.

|  | **Riser card A/B** | **Riser card C/D** |
|---|---|---|
| **Alternating population** | 1A + 1B (minimum configuration) | - - |
| Upgrade 1 | - - | 1C + 1D |
| Upgrade 2 | 2A + 2B | - - |
| Upgrade 3 | - - | 2C +2D |
| Upgrade 4 | 3A + 3B | - - |
| Upgrade 5 | - - | 3C + 3D |
| Upgrade 6 | 4A + 4B |  |
| Upgrade 7 |  | 4C + 4D |
| **Consecutive population** | 1A + 1B (minimum configuration) | - - |
| Upgrade 2 - 4 | 2A + 2B<br>3A + 3B<br>4A + 4B | - - |
| Upgrade 5 - 8 | - - | 1C + 1D<br>2C + 2D<br>3C + 3D<br>4C + 4D |

Table 2: Alternating and consecutive population for 2 riser cards

**Mirrored mode**

The mirrored mode requires memory modules in matched sets of four, two in each riser card.

1A + 1B, 1C + 1D (minimum configuration)

2A + 2B, 2C + 2D (upgrade 1); 3A + 3B, 3C + 3D (upgrade 2); 4A + 4B, 4C + 4D (upgrade 3)

**Sparing mode**

Only one riser card is required for the sparing mode. The last populated bank will be in hotspare mode.

1A + 1B, 2A +2B
minimum configuration, bank 2 in hotspare mode

1A + 1B, 2A +2B, 3A +3B
upgrade 1, bank 3 in hotspare mode

1A + 1B, 2A +2B, 3A +3B, 4A + 4B
upgrade 2, bank 4 in hotspare mode

# 3.3 PCI(e) slots

Slot 7 PCI Express        7

Slot 6 PCI Express        6

Slot 5 PCI Express        5

Slot 4 PCI X        4

Slot 3 PCI Express        3

Slot 2 PCI Express        2
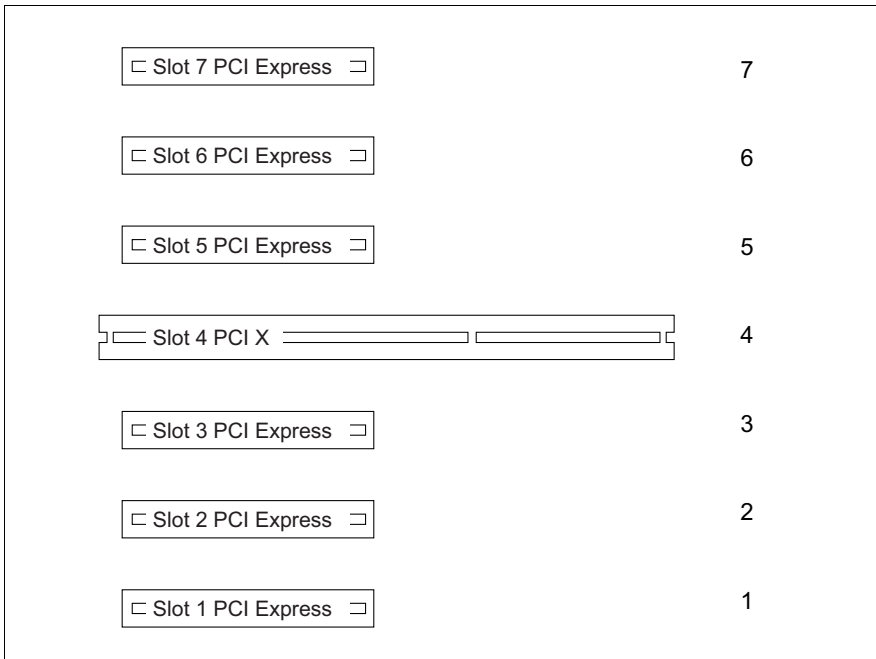
Slot 1 PCI Express        1

Figure 4: Mechanical PCI slots (the PCI slot numbers on the rear)

**PCI slots**

The following table shows an overview of the PCI slots:

| PCI slot | Bit | Frequency in MHz | Description |
|----------|--------|------------------|------------------|
| 1 | | | PCI e x4 slot |
| 2 | | | PCI e x4 slot |
| 3 | | | PCI e x4/x8 slot |
| 4 | 64 Bit | 133 | 64-Bit PCI-X slot |
| 5 | | | PCI e x4 slot |
| 6 | | | PCI e x4/x8 slot |
| 7 | | | PCI e x4 slot |

Slot 3 and slot 6 are automatically used as x8 slots, if slot 2 respectivly slot 5 are not occupied.

**PCI, PCI-X, PCI Express interrupts**

Each device connected to a PCI bus or PCI Express can use up to four interrupt signals depending on the functionality.

PCI and PCI-X buses use four lines named INTA to INTD, typically connected to all devices on the bus in order to periodically balance interrupt load. An interrupt signal may thereby be used simultaneously by multiple devices (interrupt sharing).

PCI Express devices send their interrupts through messages. The interrupts are defined by the system design.

The following interrupt signals are used in the system:

| Slot/device | Property | Interruptsignal |
|---|---|---|
| VGA | iRMC Grafik | Int A |
| LAN 1 | BCM5708 | Int B |
| LAN 2 | BCM5708 | Int C |
| Steckplatz 7 | PCI e x4 | Int A, B, C, D |
| Steckplatz 6 | PCIe x8 | Int A, B, C, D |
| Steckplatz 5 | PCIe x4 | Int A, B, C, D |
| Steckplatz 4 | PCI (133 MHz) | Int A, B, C, D |
| Steckplatz 3 | PCIe x8 | Int A, B, C, D |
| Steckplatz 2 | PCIe x4 | Int B, C, D, A |
| Steckplatz 1 | PCIe x4 | Int A, B, C, D |

**Assignment of the PCI interrupts**

If you select *Auto* in the BIOS setup, the interrupts are assigned automatically and no further settings are required.

# 3.4     Screen resolution

Depending on the operating system used the screen resolutions in the following table refer to the graphic controller on the system board. The graphic controller is integrated in the iRMC (integrated Remote Management Controller).

| Screen resolution | Max. color depth | Max. frequency |
|-------------------|------------------|----------------|
| 640 x 480 Hz | 32 Bit | 85 Hz |
| 800 x 600 Hz | 32 Bit | 85 Hz |
| 1024 x 768 Hz | 32 Bit | 75 Hz |
| 1152 x 864 Hz | 24 Bit | 60 Hz |
| 1280 x 1024 Hz | 24 Bit | 60 Hz |
| 1600 x 1200 Hz | 16 Bit | 60 Hz |

If you are using an external graphic controller, you will find details of supported screen resolutions in the operating manual or technical manual supplied with the graphic controller.

# 3.5     Temperature / system monitoring

Temperature and system monitoring aim to reliably protect the computer hardware against damage and to provide any information about the system status.

Temperature and system monitoring is managed via an onboard controller.

The following functions are supported:

### Temperature monitoring

Measurement of the processor and the system board internal temperature by a temperature sensor, measurement of the ambient temperature by a $I^2C$ temperature sensor.

### Fan speed monitoring

The CPU, power supply unit and system fans are monitored. Fans that are no longer available, blocked or sticky fans are detected.

**Fan speed control**

The fan speed is controlled according to temperature.
The criteria are the ambient temperature, the CPU temperature, and the memory temperature.

**Sensor monitoring**

If the $I^2C$ temperature sensor is defect or missing, all fans monitored by this sensor, run with maximum speed to achieve the greatest possible protection of the hardware.

**Voltage monitoring (of the internal voltages)**

If one of the internal voltages reaches its upper or lower threshold an alarm is generated.

**Cover monitoring**

Unauthorized opening of the cover is detected, even when the system is switched off (power down mode). However, this will only be indicated when the system is switched on again.

**System Event Log (SEL)**

All monitored events of the system board are signalized via the Global Error LED and recorded in the System Event Log. They could be retrieved in the BIOS Setup or via ServerView.

**PRIMERGY Diagnostic LEDs**

LEDs on the system board enable to identify defective modules and components as well as gaining information on the PDA.
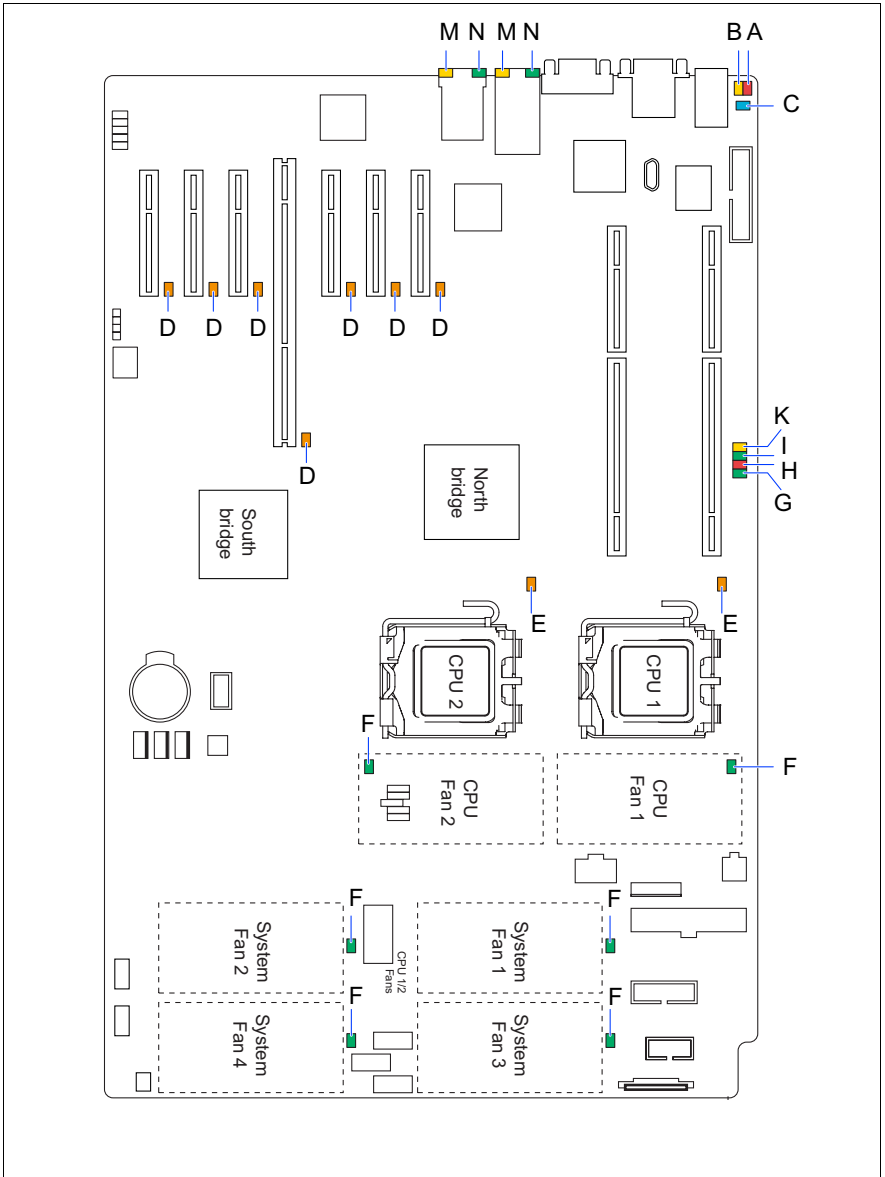
# 3.6    LEDs
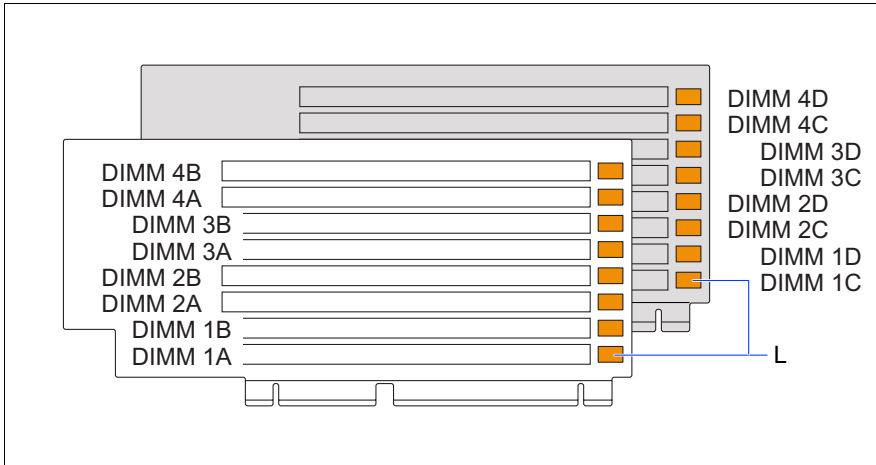


Figure 5: LEDs on the system board

Figure 6: LEDs on the riser card

LED s A, B and C are visible from outside on the rear of the server. All the other LEDs are only visible, if the cover of the server has been opened.

If the server has been powered off (power-plugs must be disconnected) it is possible to indicate the faulty component by pressing the indicate CSS button.

The LEDs have the following meaning:

| LED | Anzeige | Bedeutung |
|---|---|---|
| A - CSS (Customer Self Service) | yellow | indicates a prefailure |
| | yellow flashing | indicates a failure |
| B - GEL (Global Error LED) | orange | indicates a prefailure |
| | orange flashing | indicates a failure. Reasons for a failure may be:<br>- overheating of one of the sensors<br>- sensor defect<br>- fan defect<br>- CPU error<br>- voltage incorrect<br>- Software detected an error |
| C - Identification | blue | server is identified via ServerView |

| LED | Anzeige | Bedeutung |
|---|---|---|
| D - PCI card | off | PCI card ok |
| | orange | PCUI card failure |
| E - CPU | orange | CPU error (Local Diagnostic LED) |
| | off | CPU ok |
| F - Fan | green | fan ok |
| | orange | fan error (Local Diagnostic LED) |
| G- iRMC | green flashing | iRMC - Server Management Controller ok |
| | off | iRMC not active |
| H - Board Error | red | configuration error. The system board will be held in reset. Possible configuration errors are e.g.: old CPU populated, CPUs with different FSB requirements populated, CPU1 not populated. |
| I - Main Power | green | system running |
| K - Aux Power | yellow | auxiliary power ok |
| | off | auxiliary power not available |
| L - Memoryr | off | memory module ok |
| | orange | error in memorymodule |
| M - LAN-Trans-ferrate | yellow | siehe page 31 |
| N -LAN-Link/Aktivität | green/ | siehe page 31 |

# 3.7 Interfaces and connectors
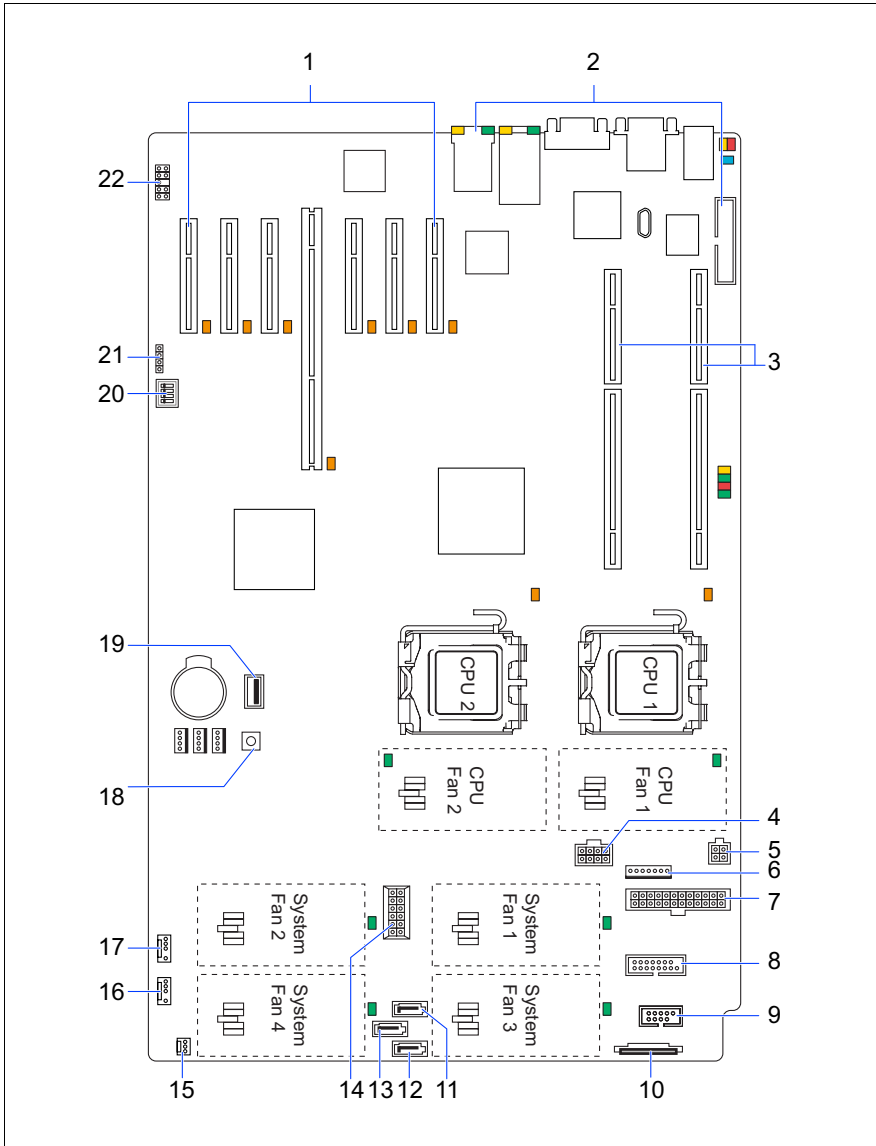


Figure 7: Schematic view of the system board D2529

1   = PCI slots                              12 = SATA4

2   = external ports                         13 = SATA2

3   = slots for main memory modules         14 = CPU 1/2 fan

4   = Power supply PWR2                      15 = Intrusion

5   = Power supply PWR3                      16 = USB 2 AUX

6   = PC98                                   17 = USB 1 AUX

7   = Power supply PWR1                      18 = CSS push-button

8   = Front panel                           19 = USB intern

9   = USB front                             20 = DIP-Schalter (siehe page 32)

10 = Floppy disk drive                      21 = HD LED

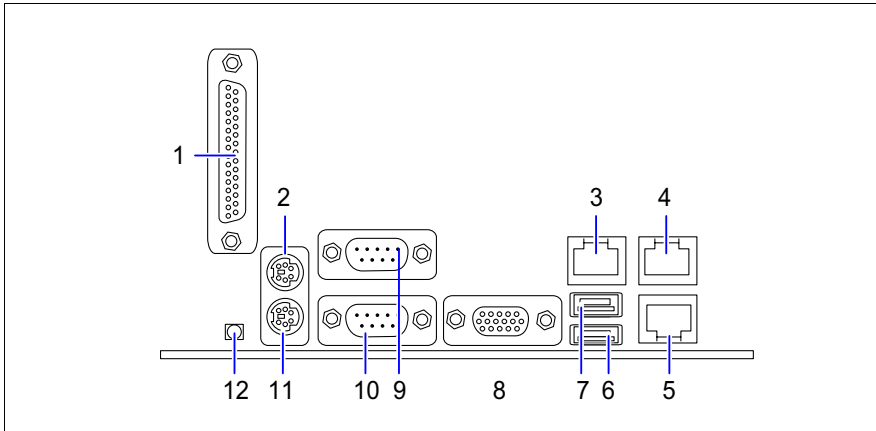11 = SATA1                                  22 = LPC bus (for assembly only)

## 3.7.1   External ports



Figure 8: External ports of the system board D2529

| | | | |
|---|---|---|---|
| 1 | = Printer port (optional) | 7 | = USB port 4 |
| 2 | = PS/2 mouse connector | 8 | = VGA port |
| 3 | = LAN connector (service LAN) | 9 | = Serial interface COM1 |
| 4 | = LAN connector 2 | 10 | = Serial interface COM2 |
| 5 | = LAN connector 1 | 11 | = PS/2 keyboard connector |
| 6 | = USB port 3 | 12 | = CSS LED (yellow)/<br>Global Error LED (orange)/<br>Identifications LED (blue) |

The serial interface COM1 can be used as default interface or to communicate with the iRMC.

**LAN connectors**

The system board is populated with three LAN controllers.

– 2 Gigabit LAN controllers (BCM5708) for system LAN 1 and system LAN 2

System LAN 1 and system LAN 2 support:

   – transfer rates of 10 Mbit/s, 100 Mbit/s and 1 Gbit/s

   – WOL function through Magic Packet™

   – Intel PXE. It is possible to boot tehe system without its own boot hard disk via LAN.

In addition system LAN 1 can be used as shared service LAN.

– 1 dedicated service LAN controller

   – supports the transfer rates of 10 Mbit/s and 100 Mbit/s

   –  serves as management interface

   – is prepared for RemoteView

The LAN connectors are equipped each with two LEDs (light emitting diode) indicating the transfer rate and the activity.
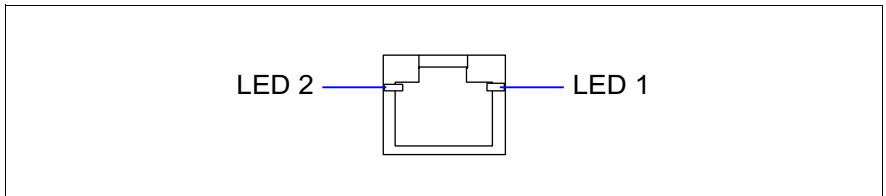


Figure 9: LAN connector single-channel Gigabit LAN controller

| LAN 1 | LAN transfer rate | green + yellow | off | transfer rate 10 Mbit/s |
|-------|-------------------|----------------|-----|-------------------------|
|       |                   | green | on | transfer rate 100 Mbit/s |
|       |                   | yellow | on | transfer rate 1000 Mbit/s |
| LAN 2 | LAN link/activity | green | on | LAN connection |
|       |                   |       | off | no LAN connection |
|       |                   |       | flashing | LAN transfer |

LED 2 ——————— LED 1

Figure 10: LAN connector service LAN controller

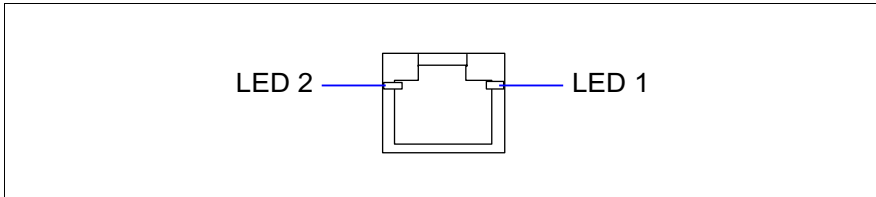| LAN 1 | LAN transfer rate | green | off | transfer rate 10 Mbit/s |
|-------|-------------------|-------|-----|-------------------------|
|       |                   | green | on | transfer rate 100 Mbit/s |
| LAN 2 | LAN link/activity | green | on | LAN connection |
|       |                   |       | off | no LAN connection |
|       |                   |       | flashing | LAN transfer |

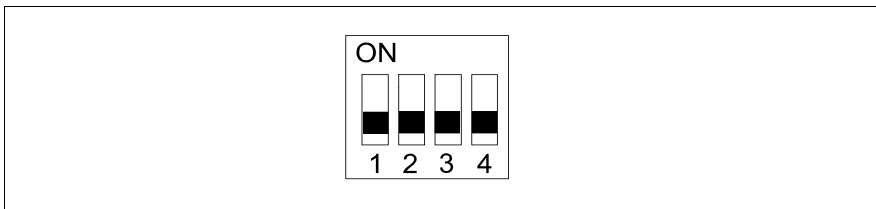# 3.8    Settings with DIP switches



Figure 11: DIP switch

> **i**    Preset for switches 1 to 4 = *Off*.

**Recovering System BIOS (recovery switch) - switch 1**

Switch 1 enables recovery of the old system BIOS after an attempt to update has failed. To restore the old system BIOS you need a Flash BIOS medium (please call our customer service centre).

*on*    The system boots from the Flash BIOS medium (floppy disk, DVD/CD-ROM, USB sstick) and reprograms the system BIOS on the board.

*off*    The System BIOS is started with the system BIOS from the system board (default setting).

**Skipping the password query - switch 2**

Switch 2 is used to define whether the password is queried at system startup, if the password protection is enabled in BIOS Setup (in *Security* menu, the *Password* field must be set to *Enabled*).

*on*     The password query is skipped. Passwords are deleted.

*off*    The password query is effective (default setting).

**Write protection for Flash BIOS - switch 3**

Switch 3 is used to define whether the System BIOS is write protected or not.

*on*     The System BIOS can neither be written to nor deleted. Flash-BIOS update from floppy disk is not possible.

*off*    The System BIOS can be written or deleted. Flash-BIOS update from floppy disk is possible (default setting)

**Write protection for floppy disks - switch 4**

Switch 4 is used to define whether floppy disks can be written or deleted in the floppy disk drive. To write and delete floppy disks, the write-protection in BIOS Setup must be disabled (in menu *Security*, the field *Diskette Write* must be set to *Enabled*).

*on*     The floppy disk drive is write-protected.

*off*    Floppy disks can be read, written and deleted (default setting).

# 4 Replacing the lithium battery

In order to save the system information permanently, a lithium battery is installed to provide the CMOS-memory with a current. When the charge is too low or the battery is empty, a corresponding error message is provided. The lithium battery must then be replaced.

⚠ **CAUTION!**

The lithium battery must be replaced with an identical battery or a battery type recommended by the manufacturer (CR2450).

Do not throw lithium batteries into the trash can. It must be disposed of in accordance with local regulations concerning special waste.

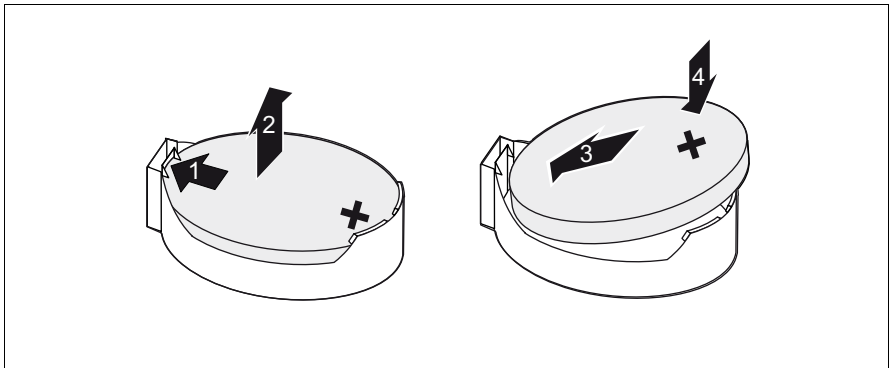Make sure that you insert the battery the right way round. The plus pole must be on the top!



Figure 12: Replacing the lithium battery

► Press the locking spring into direction of the arrow (1), so that the lithium battery jumps out of its socket.

► Remove the battery (2).

► Insert a new lithium battery of the same type into the socket (3) and (4).

# Abbreviations

The technical terms and abbreviations given below represent only a selection of the full list of common technical terms and abbreviations.

Not all technical terms and abbreviations listed here are valid for the described system board.

**ACPI**
    Advanced Configuration and Power Interface

**ASR&R**
    Automatic Server Recovery and Restart

**ATA**
    Advanced Technology Attachment

**BBU**
    Battery Backup Unit

**BIOS**
    Basic Input Output System

**BMC**
    Baseboard Management Controller

**CMOS**
    Complementary Metal Oxide Semiconductor

**COM**
    COMmunication port

**CPU**
    Central Processing Unit

**DDR**
    Double Data Rate

**DIMM**
    Dual In-line Memory Module

**DIP**

Dual In-line Package

**DMI**

Desktop Management Interface

**DRAM**

Dynamic Random Access Memory

**ECC**

Error Correction Code

**EEPROM**

Electrical Erasable Programmable Read Only Memory

**EPROM**

Erasable Programmable Read Only Memory

**EMRL**

Embedded RAID Logic

**EVRD**

Enterprise VRD

**FBD**

Fully Buffered DIMM

**HPC**

Hot-plug Controller

**ICE**

In Circuit Emulation

**IDE**

Integrated (intelligent) Drive Electronics

**IME**

Integrated Mirror Enhanced

**IOOP**

Intelligent Organization Of PCI

**IPMB**
    Intelligent Platform Management Bus

**IPMI**
    Intelligent Platform Management Interface

**iRMC**
    integrated Remote Management Controller

**iSCSI**
    internet Small Computer System Interface

**LAN**
    Local Area Network

**LED**
    Light Emitting Diode

**LPC**
    Low Pin Count

**MPS**
    Multi Processor Specification

**MTS**
    MegaTransfers per Second

**NMI**
    Non Maskable Interrupt

**OEM**
    Original Equipment Manufacturer

**OHCI**
    Open Host Controller Interface

**OS**
    Operating System

**PCI**
    Peripheral Components Interconnect

## Abbreviations

**PDA**
Prefailure Detection and Analyzing

**PIO**
Programmed Input Output

**PLD**
Programmable Logic Device

**PS(U)**
Power Supply (Unit)

**PWM**
Puls Wide Modulation

**PXE**
Preboot eXecution Environment

**RAID**
Redundant Array of Inexpensive Disks

**RSB**
Remote Service Board

**RST**
ReSeT

**RTC**
Real Time Clock

**SAS**
Serial Attached SCSI

**SATA**
Serial ATA

**SCSI**
Small Computer Systems Interface

**SDDC**
Single Device Data Correction

**SDRAM**
Synchronous Dynamic Random Access Memory

**SHDG**
Server Hardware Design Guide

**SMB**
System Management Bus

**SMM**
Server Management Mode

**SMP**
Symmetrically Multi Processing

**TMP**
Trusted Platform Module

**UHCI**
Unified Host Controller Interface

**USB**
Universal Serial Bus

**VGA**
Video Graphics Adapter

**VRD**
Voltage Regulator Down

**VRM**
Voltage Regulator Module

**WfM**
Wired for Management

**WOL**
Wake up On LAN

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