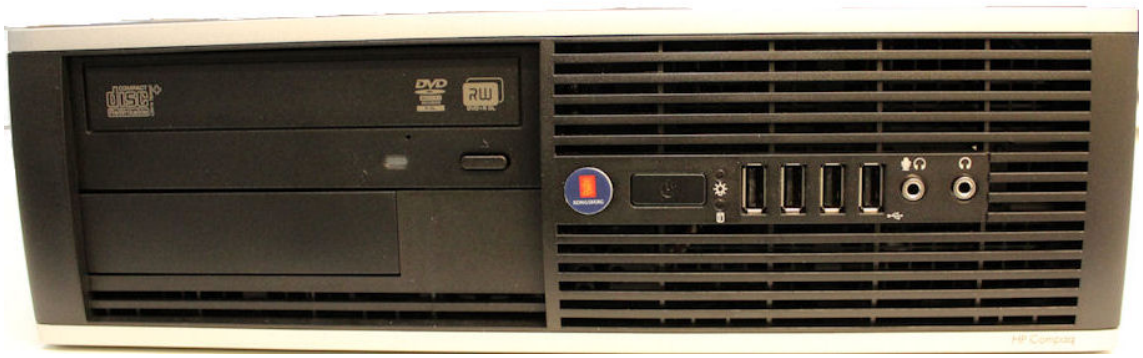
KONGSBERG

# *MP8200*

## *Maintenance Manual*

Kongsberg Maritime part numbers:

| | |
|---|---|
| MP8200 Matrox Extio model: | 364600 |
| MP8200 4–screen model: | 364601 |
| MP8200 8 channel serial line model: | 364602 |
| MP8200 Base model: | 364613 |
| MP8200 HS/DP Recorder 500 model: | 364615 |
| MP8200 with LAN/CAN + 2 COM ports model: | 364618 |
| MP8200 dual LAN/CAN model: | 366196 |
| MP8200 NAV model: | 364620 |
| MP8200 2-screen model: | 364621 |
| MP8200 K-Chief 600 model: | 364622 |
| MP8200 K-Chief 500 model: | 364623 |
| MP8200 FMS Server model: | 364624 |
| MP8200H: | 369274 |



366813/B

## Document history

| Document number: 366813 / Rev. B | | |
|---|---|---|
| Rev. A | March 2012 | First version. |
| Rev. B | October 2012 | Corrected information about weight and removed information about IP22. |

## Note



## Comments

To assist us in making improvements to the product and to this manual, we welcome comments and constructive criticism.
e-mail: km.documentation@kongsberg.com

Kongsberg Maritime AS
www.kongsberg.com

# Table of contents

# Hardware Description

## General description

The MP8200 maritime computer is used in a wide range of Operator Stations (OSes) produced by Kongsberg Maritime.

The computer can be installed inside OS consoles by using specific mounting brackets (see relevant operator station maintenance manual for details on mounting).

The OS and process station application software is stored on the MP8200 flash disk.

The MP8200 is built around a high-performance CPU (central processing unit) running the Microsoft® Windows XP or Windows 7.

The computer can be easily dismantled for replacing module purposes.

The MP8200 accepts both 115 and 230 VAC mains input voltage.

Part numbers for the different models are shown on the front page of this document. The models differ mainly on the combination of interface cards installed.

## MP8200 computer cabinet

### Cabinet front panel

The DVD-RW drive and the hot swap HDD for the HS/DP Recorder and the MP8200H are located to the left. In the middle there is an on/off power button and further to the right there are LEDs for power and internal hard-disk drive, four USB ports, a microphone input and headphones output.

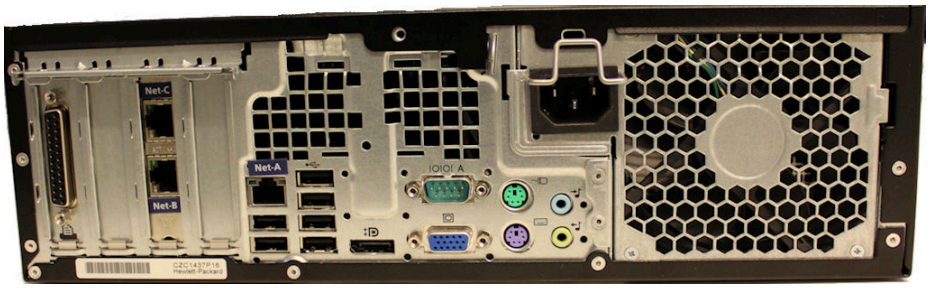
*Figure 1 Cabinet front panel*

## Cabinet rear panel

Connectors for power, user interfaces and external equipment are located on the rear panel. See *MP8200 external connections* on page 9.

Several different types of MP8200 computers are available using different interface cards. See *Interface cards and connections* on page 11.

*Figure 2 Cabinet rear panel (example)*



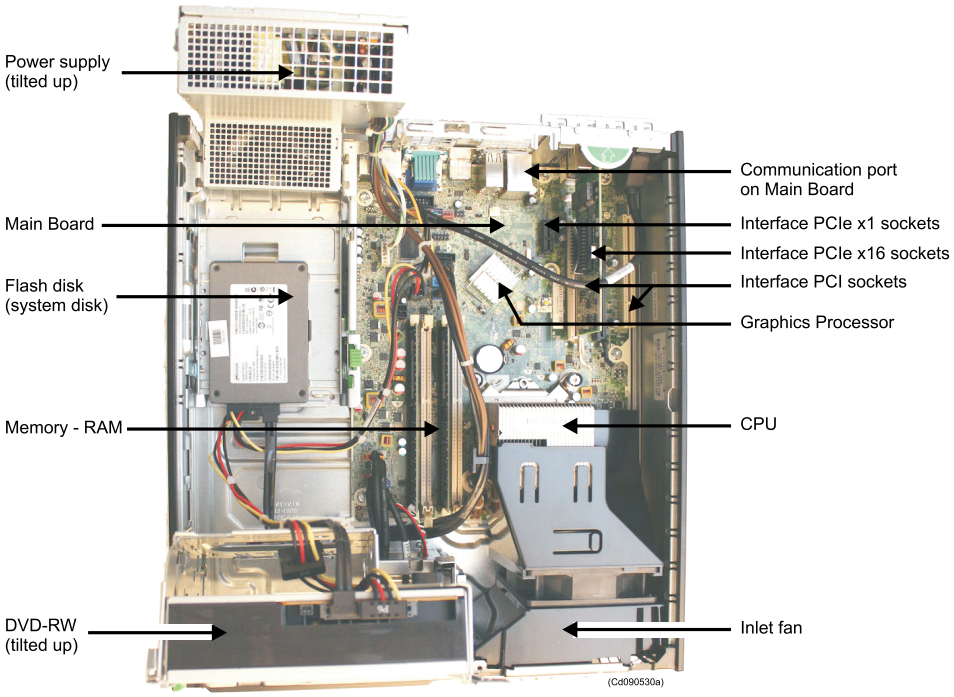

## Cabinet interior

Location of the main components inside the cabinet is shown in the figure below. The computer is shown from above with the front wall pointing towards you.

The power supply with its cooling fan is tilted up and located back to the left.

The DVD-RW drive assembly is also tilted up and located in front to the left.

*Figure 3 Cabinet interior*



The interface card assembly modules (removed in figure above) are located in the upper right hand corner. They can easily be pulled out for changing of interface cards. No screws are to be unscrewed, only lift the lever at the green coloured handle, which secures the interface cards to the main board and release the interface card lock.

# MP8200 configuration

The following cards and components are available for the different models of the MP8200:

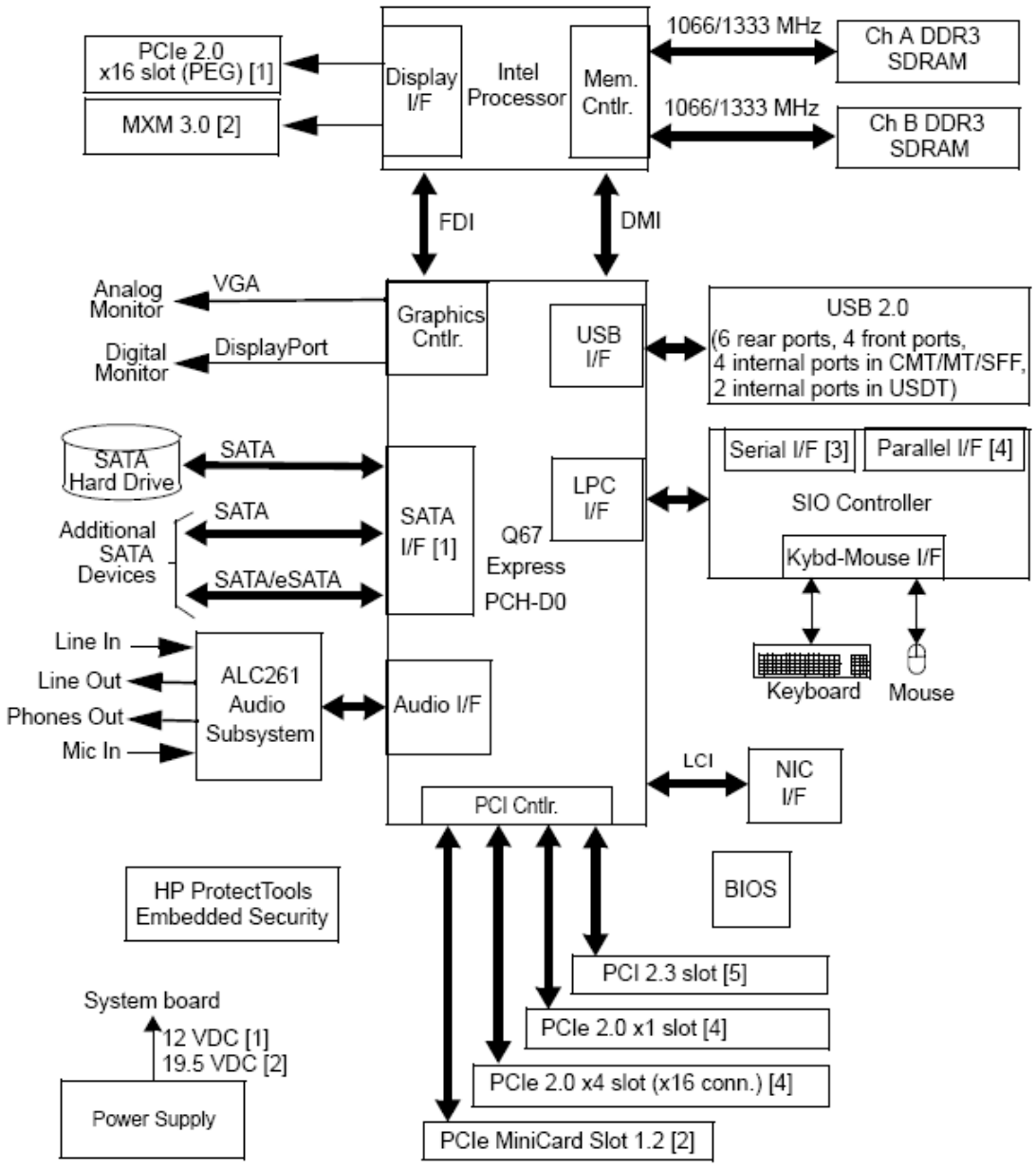
- Main board (Motherboard)
- CPU
- Memory (2 x 2 GB RAM) (all models except MP8200H)
- Memory (4 x 2 GB RAM) (MP8200H)
- Power supply 115/230 VAC
- Network card (Net B and Net C)
- Graphics card (2–screen / 4–screen)
- Serial line connector (COM2)
- BlueStorm card (8 channel serial card)
- LAN card for LAN/CAN connections
- Radar Interface card
- Flash disk (system disk)
- Hard-disk drive (recorder disk)
- DVD-RW drive
- Miniature speaker
- Reset button (On/Off)

Each of the computer and interface cards, drives and power supplies listed above are shortly described in sections below. The replaceable modules are described more detailed in separate documents (*Hardware Module Descriptions*).

The following figure shows a block diagram of the MP8200.

Note

*The figure does not show an actual MP8200 configuration, but the available interface cards, drives and power supplies.*




Notes:

[1] CMT, MT, SFF only
[2] USDT only
[3] 2 in CMT, MT, and SFF
[4] 1 in CMT, MT, and SFF only
[5] 3 in CMT, 1 in MT and SFF

## Main board

The main board is equipped with a 3.10 GHz Intel dual core CPU and 2 x 2 GB RAM.

The main board is not considered a replaceable module because the computer has to be rebuilt from scratch and thoroughly tested if the board is changed.

### Power Supply

One power module is used. It has 115 VAC or 230 VAC as input voltage, and is of type Autosense.

### Interface cards

The following interface cards are available with MP8200 computer:

Dual network card, Single network card, 2-screen graphic card, 4-screen graphic card, Radar interface card 2 (RIC2), BlueStorm eight channel serial interface card, and COM2 connector.

### Storage drives

Standard DVD-RW drive, flash disk and hard-disk drive for HS/DP Recorder data is used in the computer.

### Miniature speaker

The speaker is located inside the cabinet on the front wall.

### Cooling fans

Two CPU fans are located in the centre, behind the CPU. It provides cooling to the CPU and graphics processor.

The power supply module contains a fan located inside the power supply cabinet.

### Power ON/OFF button

A black ON/OFF button is located in the centre of the cabinet front.

Pressing the button once, the computer is turned On or Off, depending on the prerequisite.

## MP8200 external connections

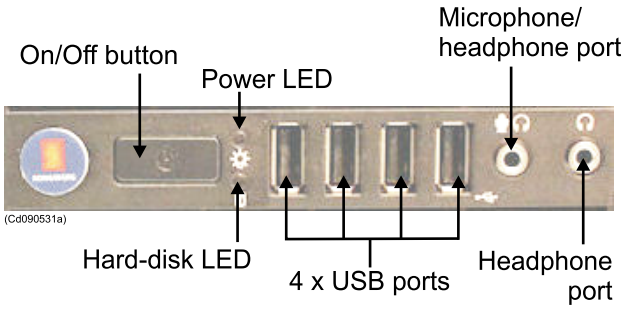
The MP8200 provides (including options) the necessary set of standard PC connectors for user interfaces and the necessary set of application-required connectors for system interfacing.

### Main board connections

This section lists the connectors available from the main board. For more details refer to the *Hardware Module Description* for the main board.

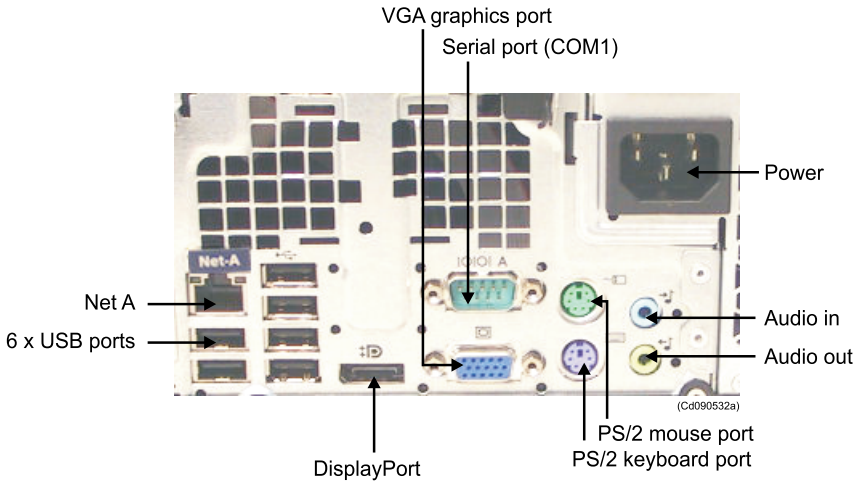
The following figure shows front connectors for external connections:

*Figure 4 Front – external connections*




The following figure shows rear wall connectors for external connections:

*Figure 5 Rear – external connections*




## Mouse

This is a standard PS/2 serial mouse connector.

## Keyboard

This is a standard PS/2 keyboard connector.

## Parallel port (not shown in the picture)

The Parallel port complies with the standard for PC parallel ports.

With appropriate driver software and configuration a local printer can be connected to this port.

Note

*The Parallel port is not included in the NAV model, MP8200H and Matrox Extio model.*

## COM1 and COM2 (not shown in the picture)

These are standard PC serial line COM ports.

### Network

This is a standard ethernet network connection based on the RJ45 connector. It is assigned to the network A in the redundant process network.

### Audio In

This is a audio line input connection based on the mini jack connector.

### Audio Out

This is a audio line output connection based on the mini jack connector.

### Microphone

This is a microphone connection based on the mini jack connector. A contact is located on the front and on the rear wall.

### Headphones

This is a headphones connection based on the mini jack connector and is located on the front.

### USB

The main board provides ten USB (Universal Serial Bus) roots (ports) for attaching USB devices. Four ports are available on the front and six on the rear panel.

## Interface cards and connections

The illustrations below shows the different types of MP8200 computers.

Several different types of MP8200 computers are available: (see front page for part numbers). Common for all rear panels are: Net A, 6 off USB ports, VGA graphics port, Display port, PS/2 mouse port, Keyboard port, Audio -in and -out, and Main power plug as shown in *Rear – external connections* on page 10.

The rear panel layout for each type is shown in figures below. It is focused on slot 1 through 4 where the differences are.

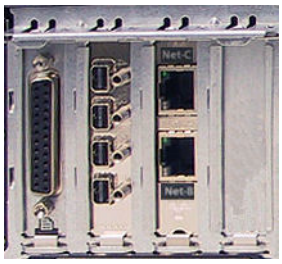
### MP8200 Base model, HS/DP Recorder model and mirrored system discs model


The different card slots are (from left to right – slot 1 through 4): Parallel port, empty slot, Dual network card (Net B and C) and an empty slot.

### MP8200 NAV model

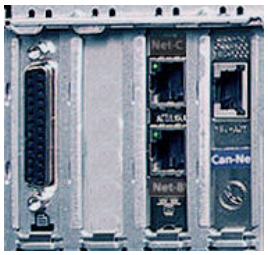

The different card slots are (from left to right – slot 1 through 4): RIC2, Dual network card (Net B and C), COM2 connector and an empty slot.

### MP8200 with 4-screen model




The different card slots are (from left to right – slot 1 through 4): Parallel port, 4-screen graphic card, Dual network card (Net B and C) and an empty slot.

### MP8200 with LAN/CAN model




The different card slots are (from left to right – slot 1 through 4): Parallel port, an empty slot, Dual network card (Net B and C) and Single network card (CAN net).

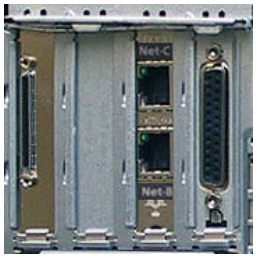
### MP8200 with LAN/CAN + 2 COM ports model


The different card slots are (from left to right – slot 1 to 4): Parallel port, COM2 connector, Dual network card (Net B and C), and Single network card (CAN net).

### MP8200 with dual LAN/CAN model


The different card slots are as follows (seen from left to right – slot 1 to 4): Parallel port, Single LAN/CAN card no. 2 (Net_WC2), Dual network card (Net B and C) and Single LAN/CAN card no. 1 (Net_WC1).

### MP8200 with BlueStorm model (8 channel serial card)




The different card slots are (from left to right – slot 1 to 4): BlueStorm card, an empty slot, Dual network card (Net B and C) and Parallel port.

### MP8200 with Matrox Extio fibre model


The different card slots are (from left to right – slot 1 to 4): COM2 connector, Dual network card (Net B and C), Parallel port and Matrox Extio fibre card (Graphic Card).

### MP8200H


The different card slots are (from left to right – slot 1 through 4): An empty slot, Dual network card (Net B and C), 2–screen graphic card and COM2 connector.

## Interface cards

### Dual network card (standard)

The dual network card is a PCIe 4x type card and provides two network ports. The lower port is normally connected to Network B, and the upper port, if required by the system, is connected to Network C. The connectors are of the RJ45 type.

### Single network card (optional)

The single network card is used as interface to the external LAN/CAN converter. It is a PCIe 16x type card. The connector on the single LAN interface card is a RJ45 type.

### Matrox Extio Fibre network card

The network card is used as interface to the external Matrox Extio KVM Extension. It is a PCIe type card.

### RIC2 (optional)

The Radar Interface Card2 (RIC2) is a PCI type card, is normally located in slot 1 and is used for connection to radar scanners.

### BlueStorm interface card

The BlueStorm card is an 8 channel serial interface card. This card is a PCI type card and provides four RS422/485 ports and four RS232 ports serial channels by the use of a special interface split cable. The connector types used on the cable are eight 9-pin male D-sub.

Note

*Read the numbering on the cable connectors for which is which serial line.*

For details refer to the *Hardware Module Description* for the BlueStorm interface card.

### Graphics cards

The 2-screen Matrox Millenium P690LP graphics card is a PCIe 16x slot card. Split cables that come with the graphics card are used for connecting to the colour monitors.

The 4-screen Matrox M9148 Plus graphics card is a PCIe 16x slot card. Split cables that come with the graphics card are used for connecting to the colour monitors.

The fibre-optic interface card Matrox Extio PCIe1x converts outgoing bus data to an optical signal and converts incoming bus data back to an electrical signal. The card transmits and receives this optical data to and from the remote graphic unit via a fibre-optic cable. Extio has integrated graphics, audio and USB hardware which process the bus data as if it was part of an add-in card directly installed in a computer expansion slot.

Note

*Read the numbering on the cable connectors for which monitor they connect.*

## Power connection

The computer is provided with a standard three-pin apparatus socket and fits a standard female three-hole apparatus plug, as shown in *Rear – external connections* on page 10.

Note

*The power supply is of the Autosense type, and thereby automatically senses correct input voltage (either 115 VAC or 230 VAC).*

## Chassis ground connection

The computer is provided with a ground terminal screw located at the right lower corner when the computer is seen from the rear side, as shown in *Rear – external connections* on page 10. This terminal must be bonded to PE (Protection Earth) with a short ground wire having large cross section.

# MP8200 Technical specifications

**POWER SUPPLY REQUIREMENTS**

| | |
|---|---|
| Voltage: | 115/230 VAC (autosense) |
| Power consumption from power supply: | 240 W |

**CONFIGURATION, PERFORMANCE AND CAPACITY**

| | |
|---|---|
| CPU type and speed: | Intel Core Duo E8400 |
| Hard-disk drive for DP/HS Recorder disk: | Hard Disc Drive 2.5” SATA |
| Flash disk: | Transcend 128 GB SSD drive |
| DVD-RW drive: | SATA 16X super multi light scribe drive |
| Memory (all models except MP8200H): | 2 x 2 GB RAM |
| Memory (MP8200H): | 4 x 2 GB RAM |
| Power Supply 115/230 VAC: | Power Supply |
| VGA: | On main board — Intel processor |
| DVI: | Display port |
| Dual network interface card:<br>(Network interface, one port on main board) | HP NC360T PCI Express Dual Port Gigabit NIC |
| Single network interface card: | Broadcom NetXtreme Gigabit PCIe NIC, (optional) |
| Graphics card (2-screen): | Matrox Millenium P690LP, PCIe x 16 |
| Graphics card (4-screen): | Matrox M9148 Plus |
| RIC: | RIC card (optional) |
| Serial interface: | - BlueStorm 8 ports RS422/485 FH surge DB09M cable |

**MECHANICAL SPECIFICATION**

| | |
|---|---|
| Size: width x depth x height: | 337 x 379 x 103 mm |
| Weight: | Approx. 7.6 kg |

**ENVIRONMENTAL REQUIREMENTS**

Refer to KM Environmental Specification, document number 161011.

**LIFE CYCLE SPECIFICATION**

| | |
|---|---|
| MTBF calculated: | 108 206 hours |

# Fault Finding

## Fault location/identification

If a fault situation has occurred, the fault is normally identified from the symptoms observed. It is therefore important to record all these observations to help the maintenance person or service engineer. All error messages shown on the screen should be logged for this purpose.

Note

*If you are not able to correct the error situation yourself, you should contact your nearest Kongsberg Maritime service office for advice or to request service.*

The fault-finding table below assumes that the problem is caused by the MP8200 computer itself and no external factors are involved.

*Table 1 Fault-finding tips*

| ID | Symptoms | Probable Error Source | Corrective Action |
|---|---|---|---|
| 1 | No visible or audible sign of power present at MP8200. Fans are not blowing. | External supply voltage is turned off or circuit-breaker fuse has tripped. | Check the 115/230 VAC power supply. |
| | | Internal power supply defect. | Replace power supply. See procedure *How to replace the Power Supply model* on page 33. |
| 2 | Applications are not loading when booting the MP8200. Only blue screen displayed. | Defective file system. | Reinstall the software by using the system backup CD. |
| 3 | Applications are not loading when booting after the entire operating system software has been installed on MP8200. Only blue screen displayed. | Defective flash disk | Replace flash disk. See procedure *How to replace the flash disk* on page 25. |
| 4 | MP8200 does not respond over network on either channel. | Network task not running. | Reboot MP8200. |
| 5 | MP8200 responds over network on only one of three channels. | Defective network card or network part of main board. | Replace network card. See procedure *How to replace a socket-mounted PCI and PCIe card* on page 30. |
| 6 | MP8200 crashes or hangs unexpectedly. | Possible defective RAM memory card. | Replace RAM memory card. See procedure *How to replace a RAM memory card* on page 32. |

# Preventive Maintenance

Replacement procedures relating to preventive maintenance, are described only in the Corrective maintenance section.

## How to clean the MP8200 cabinet surface

Use a lint-free, non-abrasive cloth and a neutral or mild soap solution for best result. Do not use a dripping wet cloth when cleaning. Use only a moistened cloth.

## Preventive maintenance intervals

Note

*These procedures should be performed on each MP8200 in the system. Local evaluations should be made to determine site-specific maintenance intervals.*

*Table 2 Recommended preventive maintenance intervals*

| ACTION | INTERVAL RECOMMENDED |
|---|---|
| Clean all operator panels.<br><br>Clean all filters for units equipped with fans. | Every week. |
| Clean cabinet surface. | Each month. |
| Check for loose connectors and wires. | Every six month. |

# Corrective Maintenance

Corrective maintenance procedures not described in this section are to be found in the appropriate *Hardware Module Description* for the part numbers referred to in the replaceable parts and recommended spare parts list. Corrective maintenance of parts not provided by any of the above should be performed by Kongsberg Maritime service personnel only.

## Replacement procedures

*Caution*

*Electrostatic charges can damage components on the cards. Notice the following precautions: Always wear a properly connected earthing strap when handling unpacked cards. Place unpacked cards only on a properly connected earthing mat or a shielding bag. Keep cards in their shielding bags when not installed. Never store cards near electromagnetic or electrostatic devices.*

Note

*Shut down the MP8200 in a controlled manner. Refer to the system operator manual for the appropriate procedure.*

***WARNING***

***To avoid the risks accompanying high voltages, always turn off the power circuit supplying the computer before you open the cabinet lid.***

### How to remove MP8200 computer from Damper kit

Two Damper kits are available: One for horizontal mounting and one for vertical e.g. door mounting, see figures below.

**1** Disconnect all cables connected to the computer.

**2** Standing in front of the computer locate the damper kit.

**3** Unscrew 4 off screws (horizontal mounting, see Figure 6) or 6 off screws (vertical mounted, see Figure 7 and ) on the damper kit securing the computer.

*Figure 6 Horizontal mounted Damper kit*

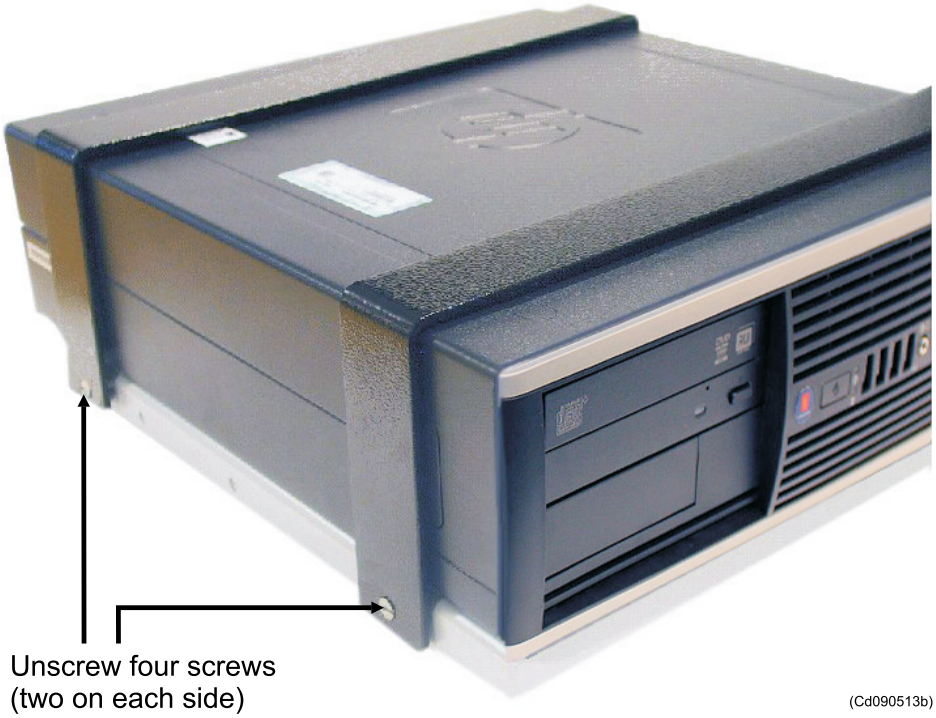
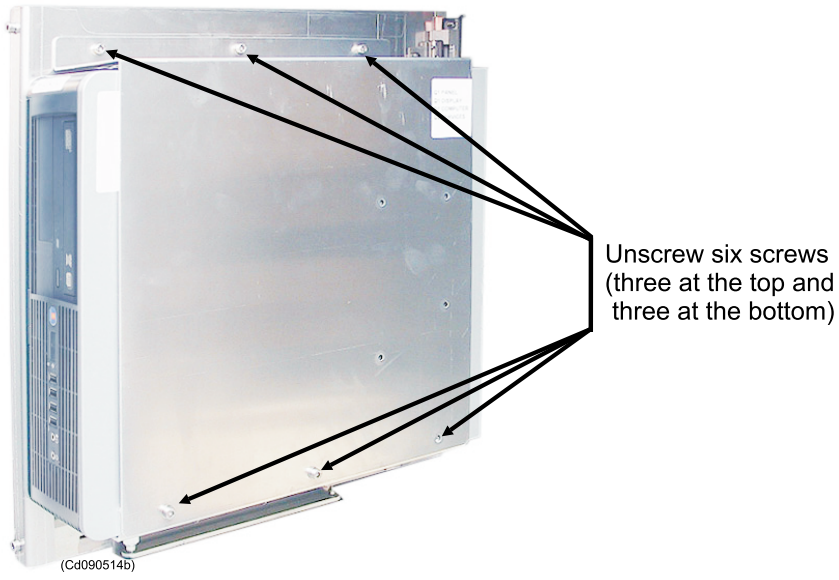



*Figure 7 Vertical mounted Damper kit (shown with a different computer type)*




**4** Carefully remove the computer and place aside.

## How to remove computer lid

1 Disconnect all cables connected to the computer.

2 Place the computer on a firm surface.

3 Use the release lever to open the lid.

*Figure 8 Release lever of the cabinet lid*

## How to replace the DVD-RW drive

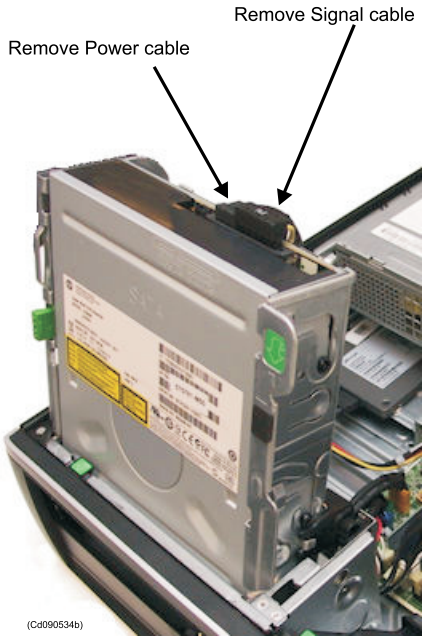
The following steps must be done before performing this procedure:

- The power to the MP8200 computer must have been turned off.
- Ensure that the new drive is equal to the one listed in recommended consumable spare part list.
- The damper kit must have been removed from the computer, as described in *How to remove MP8200 computer from Damper kit* on page 19.
- The cabinet lid must have been removed from the computer, as described in *How to remove computer lid* on page 21.

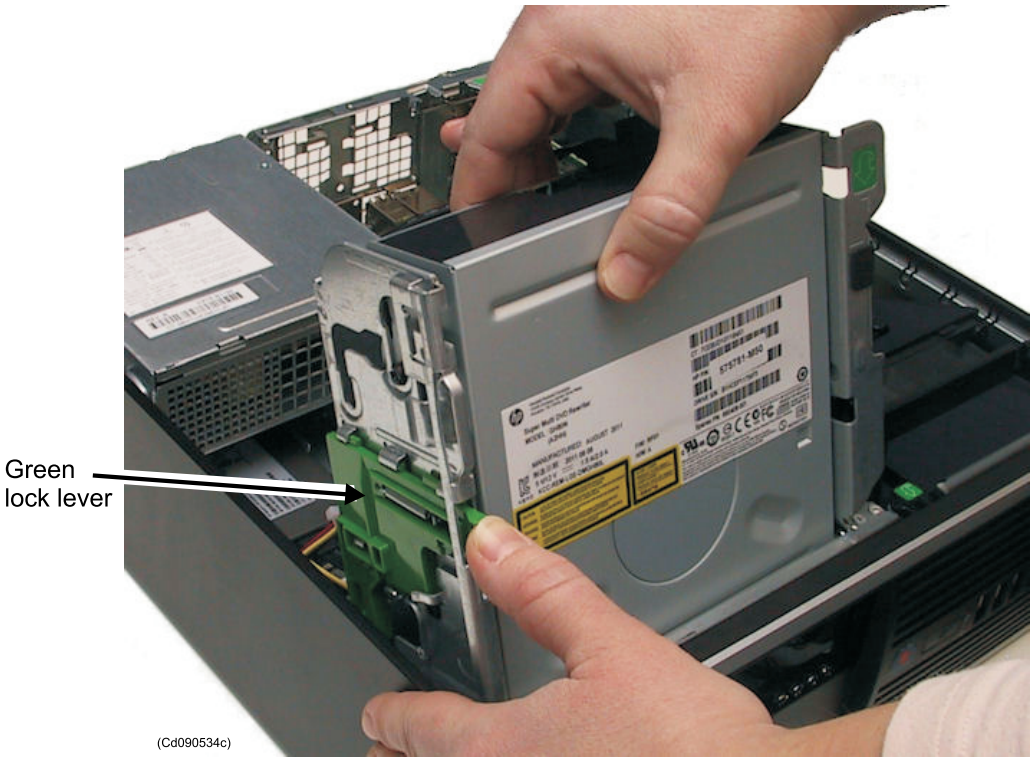
### Disassembly

**1** Tilt the DVD-RW drive assembly in upwards direction, by pulling the green coloured handle towards you.

**2** Disconnect and remove the flat signal cable and power cable from the DVD-RW drive, as identified in figure below:




**3** Release the lock for DVD-RW drive by pushing the lever in, identified in figure below.




**4** Carefully slide the drive out from its bracket.

**5** Mark the DVD-RW with a label describing the symptoms observed, carefully pack in a shielding bag and place on a secure place.

## Reassembly

**1** Set any mode jumpers of the new drive to the same positions as for the replaced drive.

**2** Reassemble by performing steps 1 to 4 of the *Disassembly* procedure above, in reverse order.

**3** Verify proper drive operation.

## How to replace the flash disk

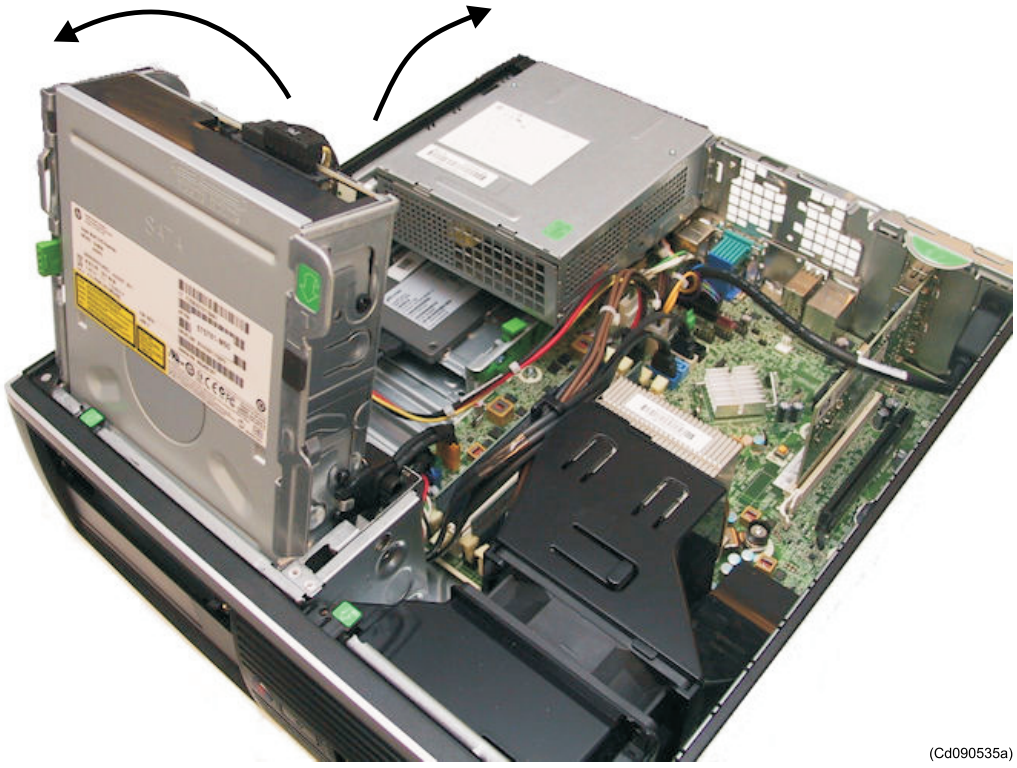
The following steps must have been done before performing this procedure:

- The power to the MP8200 computer must have been turned off.
- Ensure that the new system flash disk drive is equal to the one listed in recommended consumable spare part list.
- The damper kit must have been removed from the computer, as described in *How to remove MP8200 computer from Damper kit* on page 19.
- The cabinet lid must have been removed from the computer, as described in *How to remove computer lid* on page 21.

### Disassembly

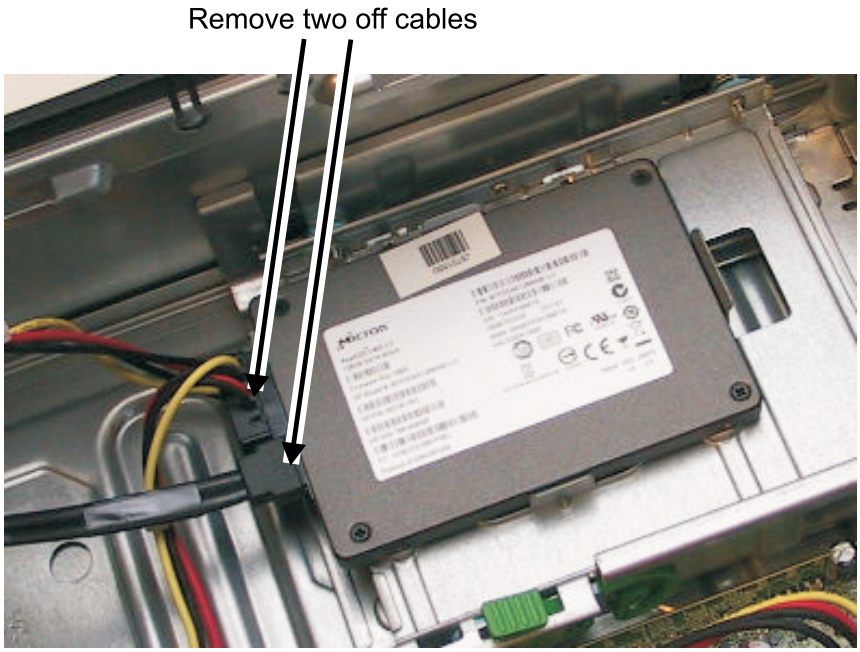
**1** Place the computer on a flat surface with the interface cards towards you.

**2** Tilt the power supply assembly and the chassis for the DVD-RW drive in upwards direction.



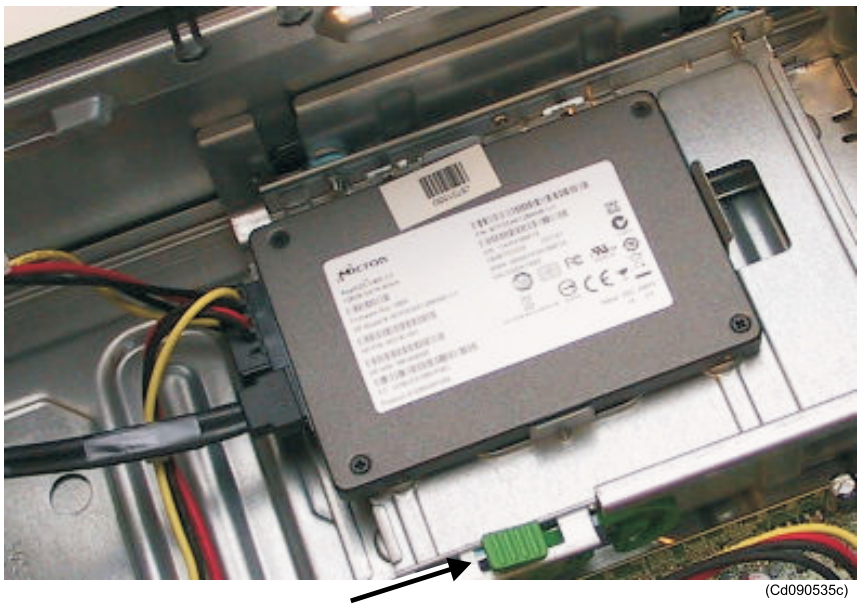
(Cd090535a)

**3** Disconnect and remove the 2 off flat cables from the disk, as identified in figure below:



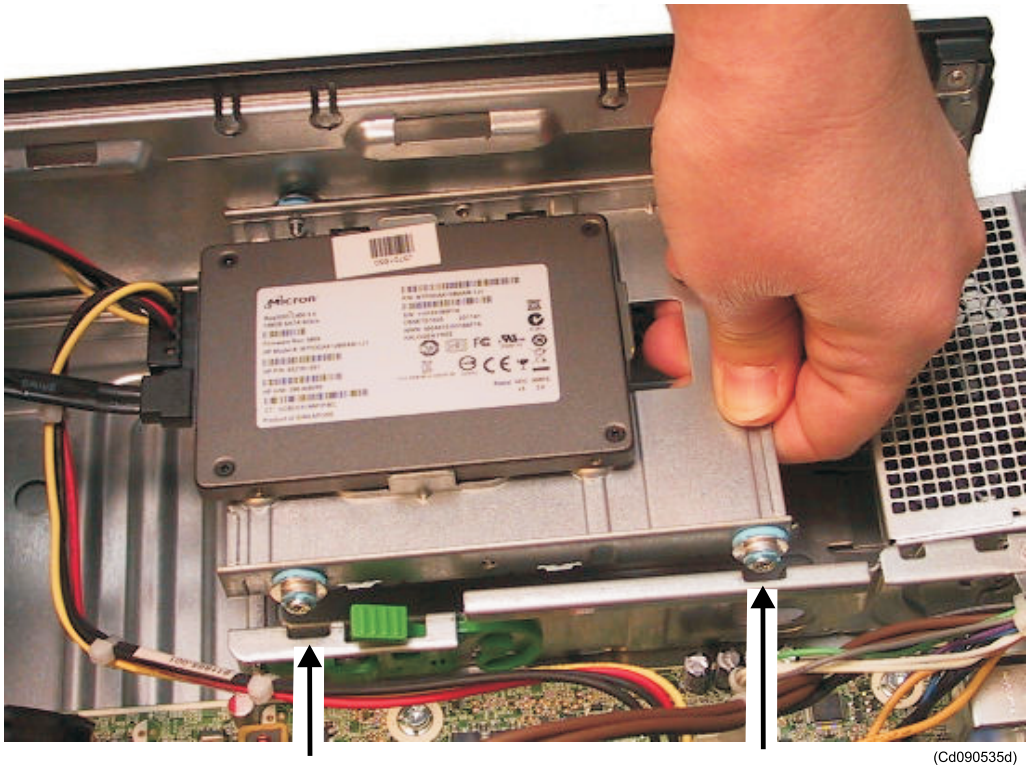

(Cd090535b)

**4** Release the lock for the flash disk by pulling out, as identified in figure below:

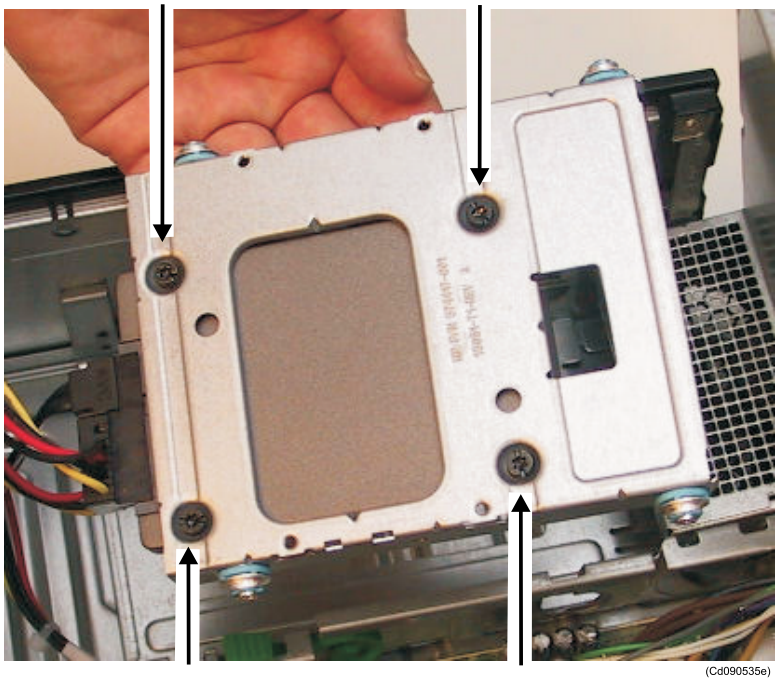


(Cd090535c)

**5** Carefully lift the disk from its frame.




**6** Release the four screws underneath.




**7** Mark the old disk with a label describing the symptoms observed, carefully pack in a shielding bag and place on a secure place.

## Reassembly

1 Reassemble by performing steps 1 to 5, of the *Disassembly* procedure, in reverse order.

2 Verify proper operation. The flash disk must then be reloaded with backup data (see separate procedure).

## How to replace the hard-disk drive for HS/DP Recorder and MP8200H

The HS/DP Recorder and MP8200H consists of one 32 Gb Flash disk, containing system application, and two mirrored hard–disks, 500 Gb each for the HS/DP Recorder, and 750 Gb for the MP8200H. These disks are for recorded data.

Note

*For each hard-disk there is an indication LED in front. If the disk is defect the LED will be lit red.*

### Disassembly

Release the hard-disk by opening the disk's front cover.

*Figure 9 Hard-disks*

## How to replace a socket-mounted PCI and PCIe card

Note

*The PCI sockets are the two white sockets, and the PCIe socket is the black socket, refer to Cabinet interior on page 6.*

Note

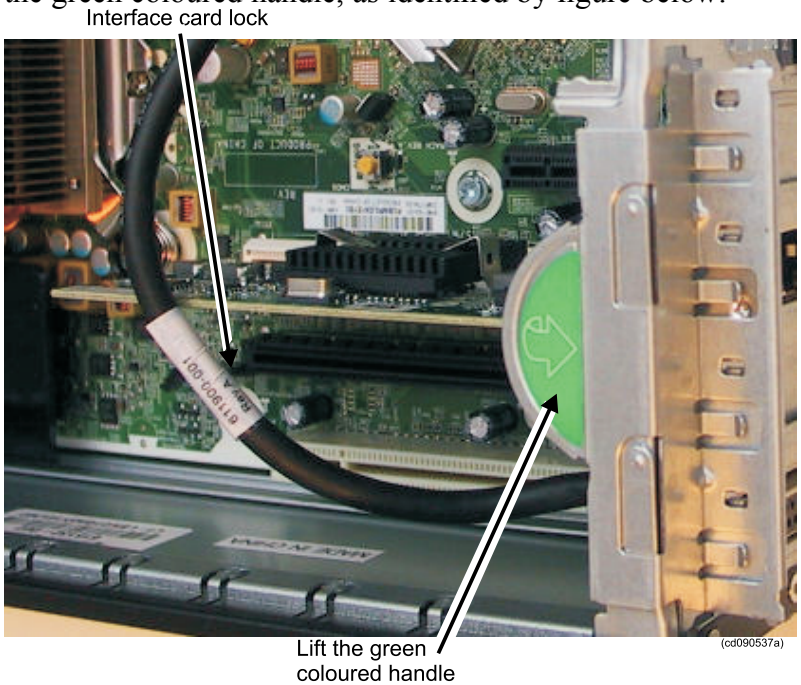
*No screws are to be unscrewed to replace an interface card, only lifting the lever at the green coloured handle, which secures the interface card to the main board.*

The following steps must have been done before performing this procedure:

- The power to the MP8200 computer must have been turned off.
- The cable must be removed from the interface card to be replaced.
- Ensure that the new card is equal to the one listed in recommended consumable spare part list.
- The kit must have been removed from the computer, as described in *How to remove MP8200 computer from Damper kit* on page 19.
- The cabinet lid must have been removed from the computer, as described in *How to remove computer lid* on page 21.

### Disassembly

**1** At the rear end of the computer, loosen the locking lever for the PCI cards by lifting the green coloured handle, as identified by figure below:




**2** Release the interface card lock and carefully pull the PCI (PCIe) card assembly to be replaced upwards from the socket card and remove the card assembly.

3 Mark the card with a label describing the symptoms observed, carefully pack in a shielding bag and place on a secure place.

## Reassembly

1 Check that all jumper and DIP settings of the new card are set correctly before starting to reassemble.

2 Reassemble by performing steps 1 to 2, of the *Disassembly* procedure, in reverse order.

3 If the card is a network card, you should perform the Checking Network Cards procedure, else verify proper operation of MP8200.

## How to replace a RAM memory card

The following steps must have been performed before performing this procedure:

- The power to the MP8200 computer must have been turned off.
- Ensure that the RAM memory card is equal to the one listed in recommended consumable spare part list.
- The kit must have been removed from the computer, as described in *How to remove MP8200 computer from Damper kit* on page 19.
- The cabinet lid must have been removed from the computer, as described in *How to remove computer lid* on page 21.

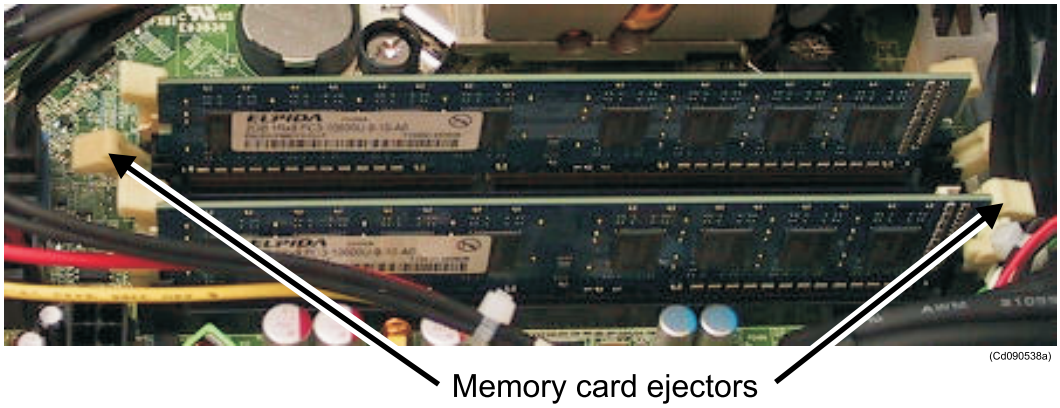
### Disassembly

1 Lift the power supply assembly and the DVD-RW assembly, as described in on page .

2 Locate the RAM memory card inside the computer.

3 Remove the RAM memory card by pressing the ejectors at both ends of the memory card to release it from the socket, see figure below:

*Figure 10 Memory card sockets with ejectors*




4 Mark the memory module with a label describing the symptoms observed, carefully pack in a shielding bag and place on a secure place.

### Reassembly

1 Reassemble by performing step 1 to 3 of the *Disassembly* procedure, in reverse order.

2 Verify proper operation of MP8200.

## How to replace the Power Supply model

The following steps must have been performed before performing this procedure:

- The power to the MP8200 computer must have been turned off.
- Ensure that the new power supply module is equal to the one listed in recommended consumable spare part list.
- The kit must have been removed from the computer, as described in *How to remove MP8200 computer from Damper kit* on page 19.
- The cabinet lid must have been removed from the computer, as described in *How to remove computer lid* on page 21.

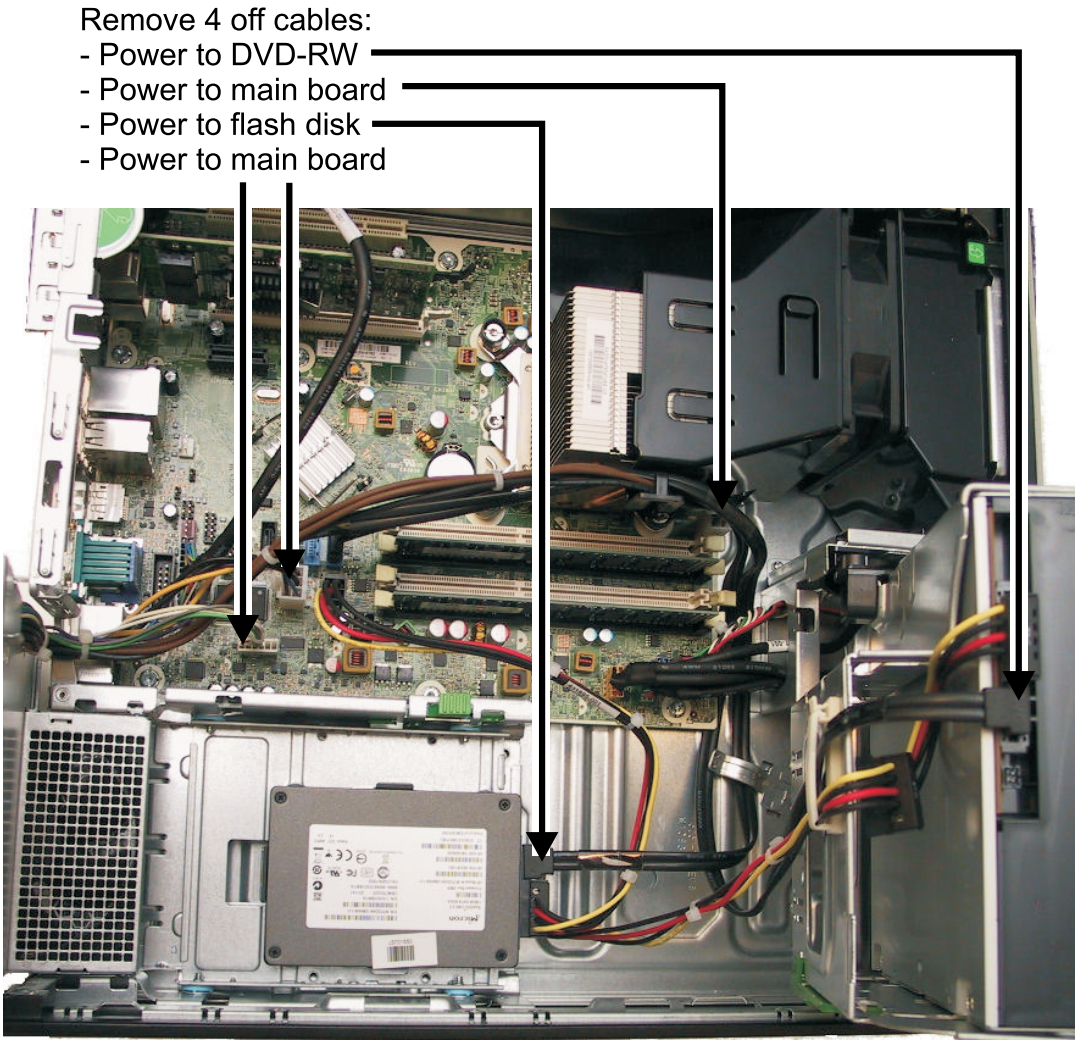
Note

*An error with the power supply module should be handled by Kongsberg Maritime Service Department only.*

### Disassembly

**1** Tilt the power supply assembly and the DVD-RW

**2** Disconnect 5 off power cables, refer to figure below:




(Cd090539b)

**3** When cables are removed, slide the power supply module towards the flash disk and out of the computer chassis by lifting upwards.

**4** If necessary, use a cutter to remove the strips that keep the cable bundles together.

**5** Mark the power supply module with a label describing the symptoms observed, carefully pack in a shielding bag and place on a secure place.

## Reassembly

**1** Reassemble by performing step 1 to 4 of the *Disassembly* procedure, in reverse order.

**2** Verify proper operation of the MP8200.

## How to replace the Filter

Note

*This procedure applies only to the MP8200 with LAN/CAN model.*

The following steps must have been performed before performing this procedure:

- The power to the MP8200 computer must have been turned off.
- Check that the new filter is equal to the one listed in recommended consumable spare part list.
- The damper kit must have been removed from the computer, as described in *How to remove MP8200 computer from Damper kit* on page 19.

### Disassembly

**1** Remove the cabinet lid (as described in *How to remove computer lid* on page 21).

**2** Press the three green handles to remove the front cover.

**3** Carefully remove the filter inside.

### Reassembly

**1** Verify proper installation and fastening of the new filter.

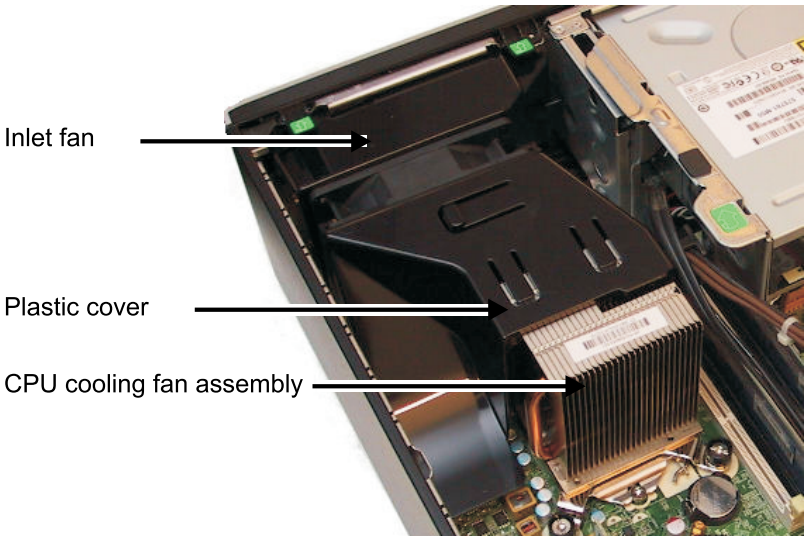
**2** Put the front cover back in place.

**3** Put the cabinet lid back in place.

## How to replace the CPU cooling fan

The following steps must have been performed before performing this procedure:

- The power to the MP8200 computer must have been turned off.
- Check that the new fan is equal to the one listed in recommended consumable spare part list.
- The kit must have been removed from the computer, as described in *How to remove MP8200 computer from Damper kit* on page 19.
- The cabinet lid must have been removed from the computer, as described in *How to remove computer lid* on page 21.
- The Plastic cover, covering the inlet fan must have been removed from inside the computer.

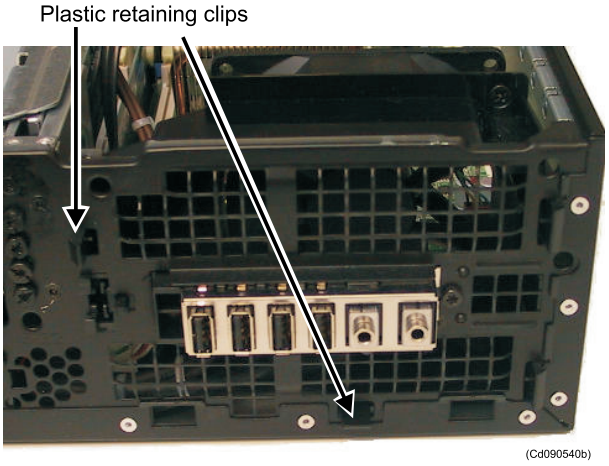



### CPU fan

#### Disassembly

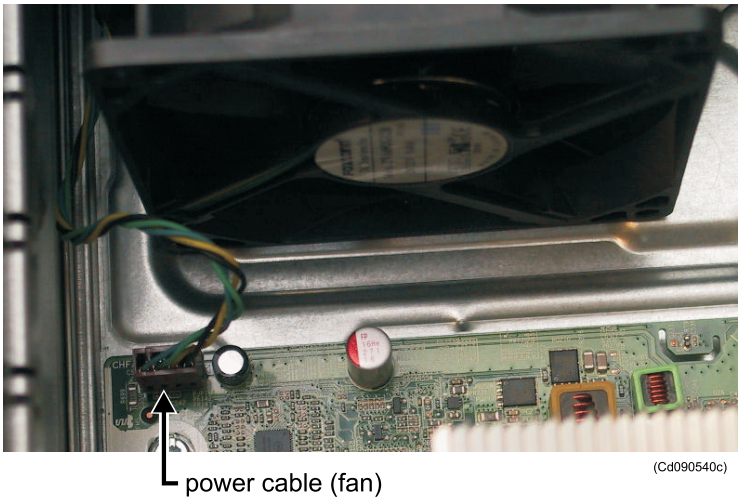
**1** Locate the CPU fan inside the computer and remove the plastic cover.

From outside of the computer, press the plastic retaining clips to release.




**2** Lift the fan assembly carefully out of the computer.

**3** Disconnect the power cable for the CPU fan (located on the motherboard).




**4** Mark the CPU fan with a label describing the symptoms observed, carefully pack in a shielding bag and place on a secure place.

## Reassembly

**1** Connect the power cable to the connector located on the motherboard of the computer.

**2** From the outside of the computer, screw the inlet fan to the computer by using the 4 off screws, one in each corner of the fan.

**3** Insert the plastic cover inside the computer, covering the inlet fan.

## How to replace the CPU

Note

*Any fault with the CPU should be handled by Kongsberg Maritime Service Department.*

## How to replace the Main Board

Note

*Any fault with the main board should be handled by Kongsberg Maritime Service Department.*

## How to replace the Built-in Speaker

Note

*Any fault with the built-in speaker should be handled by Kongsberg Maritime Service Department.*

## How to replace a MP7600 computer w/4 channel Blue Heat card with a new MP8200 computer w/8 channel BlueStorm card

The two computer types with Blue Heat cards are as follows:

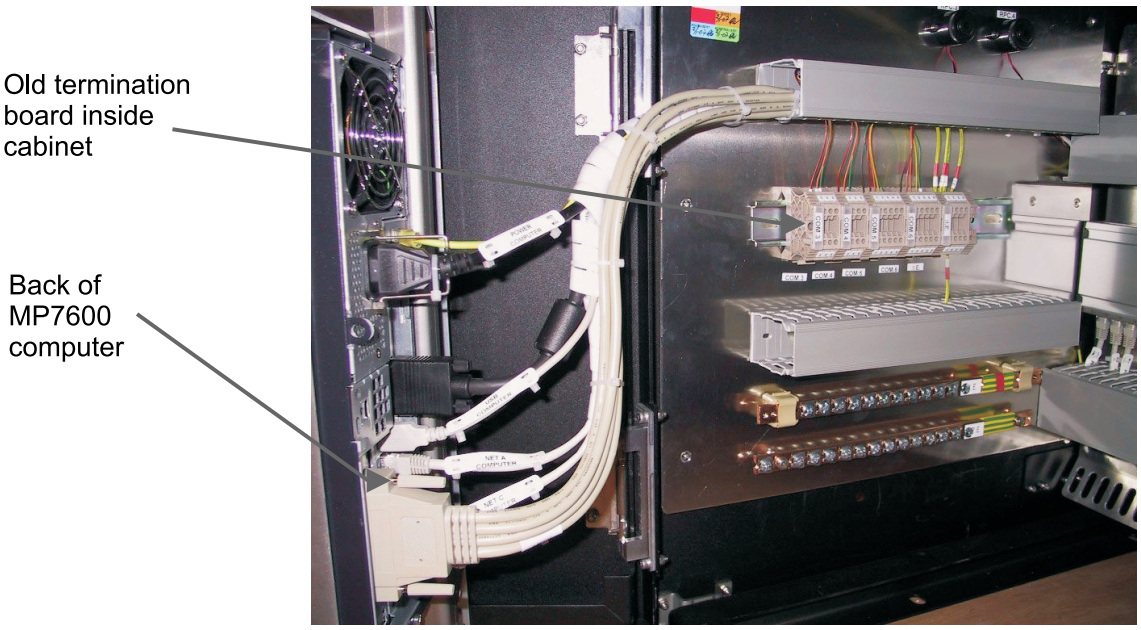
- MP7600 computer with 4 channel Blue Heat card (MP7600 w/4 ch.)
- MP7600 computer with 8 channel Blue Heat card (MP7600 w/8 ch.)

The following steps must have been done before performing this procedure:

- Ensure that the new termination board (green) is the correct type, and the correct number termination boards are available.
- The power to the MP7600 computer must have been turned off.

This is how a typical MP7600 w/4 ch. looks like inside the cabinet, where channel 1 and 2 are for RS232 and channel 3 and 4 are for RS422/485 on the old grey termination board:

*Figure 11 Typical MP7600 w/4 channel system (old termination board)*




**1** Unscrew and disconnect all the cables from the back of the MP7600 computer.

**2** Perform the procedure *How to remove MP8200 computer from Damper kit* on page 19.

**3** Then attach the new MP8200 computer with 8 channel BlueStorm card, by reversing the steps in procedure referred in step above.

**4** Attach the cables to the back of the new computer.

**5** Unscrew and disconnect the leads including the ground leads from the 4 channels on the computer side of the termination board.

Note

*Channel 1 and 2 (RS232) uses 3 leads, and channel 3 and 4 (RS422/485) uses 5 leads.*

**6** Remove the disconnected cables from the cable tray.

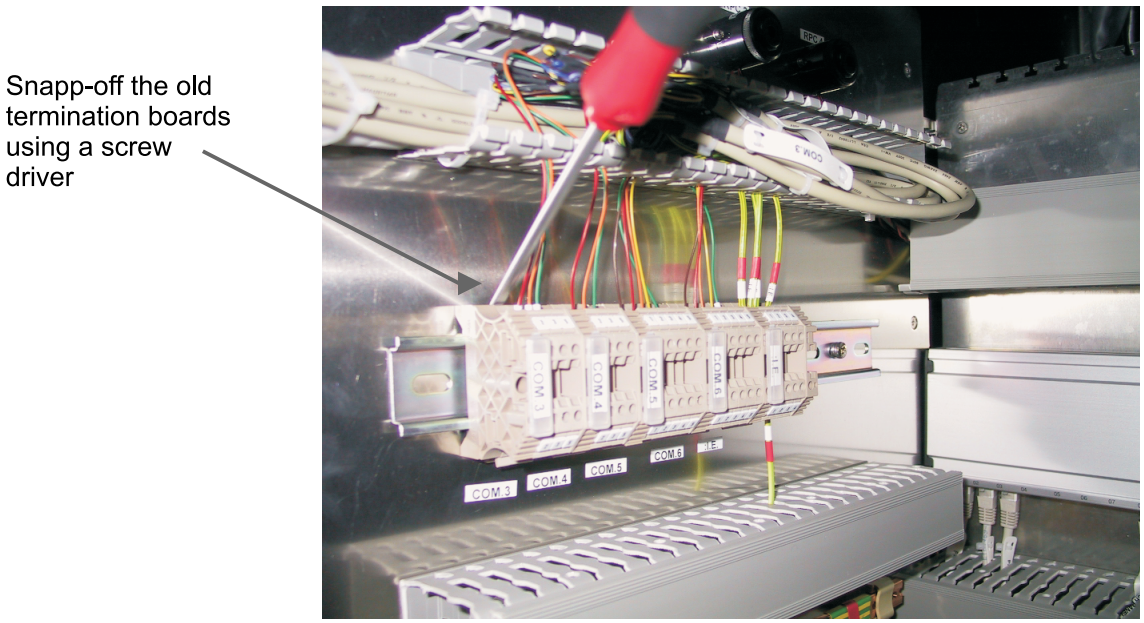
**7** Unscrew and disconnect leads including the ground leads from the 4 channels on the field side of the termination board.

Note

*It is advisable to screw the leads including the ground leads from the field side directly onto the new loose termination boards (green termination boards) before removing the old termination boards from the metal bar.*

**8** Remove the 4 off old termination boards by snapping them off the metal bar, using a screwdriver at top of the termination board, see figure below:

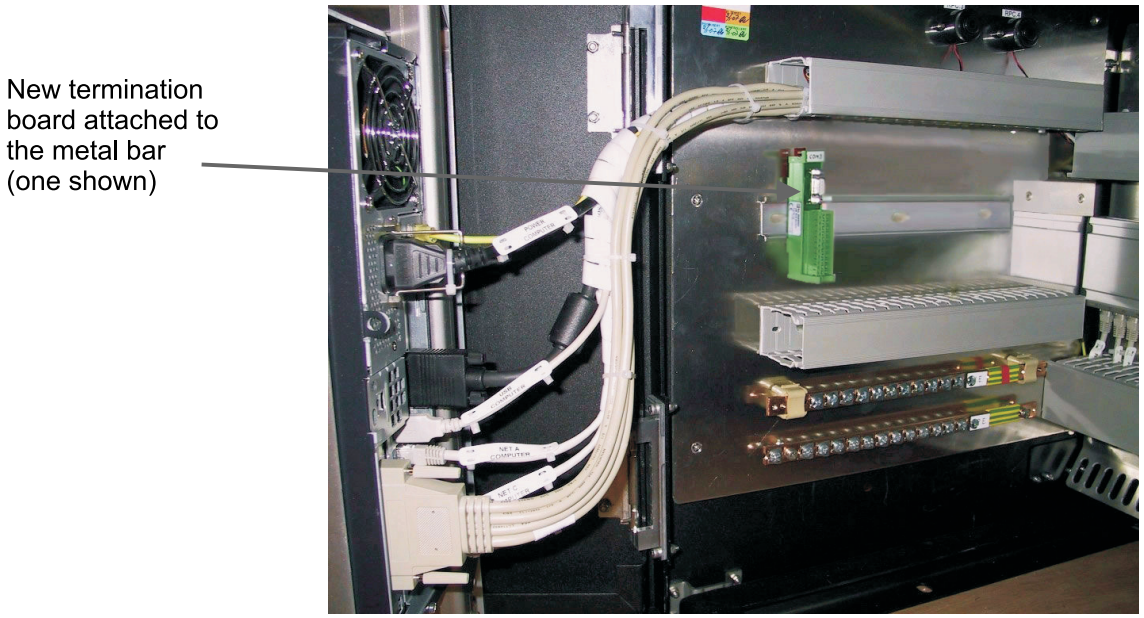
*Figure 12 Disconnecting old termination board*




**9** Connect the BlueStorm cable to the Blue Heat connector (78–pin) on back of the MP8200 computer.

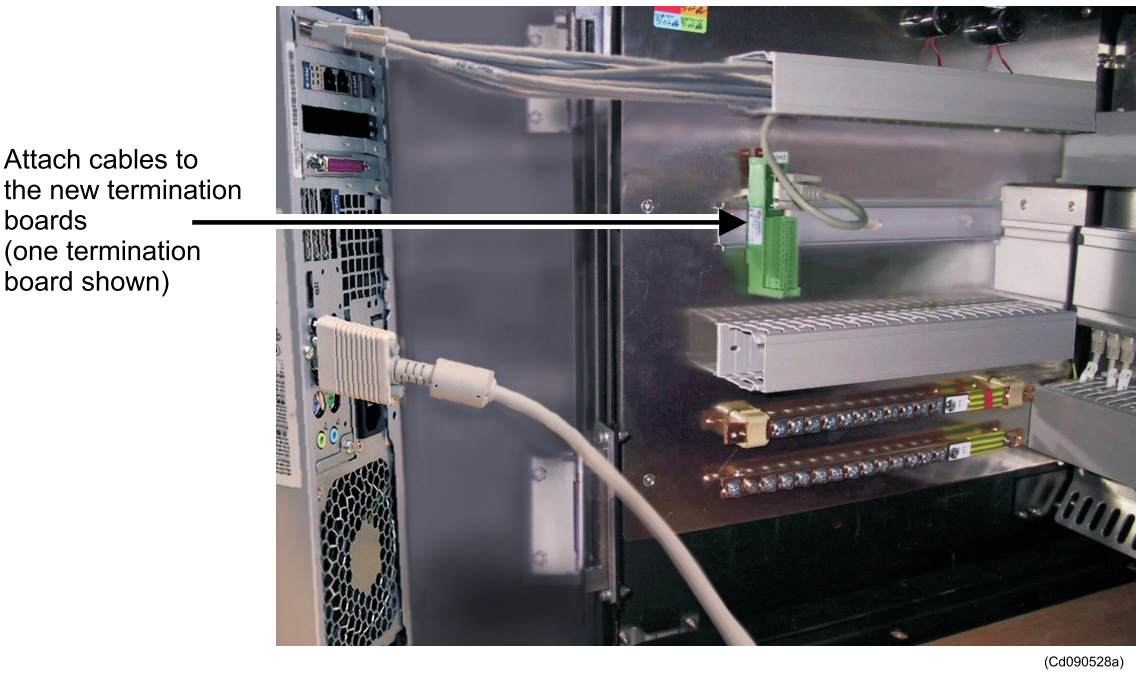
**10** Snap-on the new termination boards, onto the metal bar.

*Figure 13 Terminal board – new type*




**11** The figure below is how a typical MP8200 w/8 ch. looks like inside the cabinet (only channel 1 shown and connected).

*Figure 14 Typical MP8200 w/8 channel BlueStorm card (new terminal board)*




**12** If more termination boards are to be connected, perform steps 10 and forward.

**13** Lay the split cables inside the cable tray and snap-on the cover.

**14** If applicable, turn on power to the MP7600 computer and close the cabinet door.

Note

*See the document 365840, MP8200 Setup Procedure, for how to configure the serial line ports.*

# Replaceable Parts and Consumables

This section contains lists of replaceable parts, recommended spare parts and consumables used in MP8200. Replacement procedures for the listed parts are mainly described in the Corrective maintenance chapter. No replacement procedures are normally supplied for the consumables.

## Replaceable basic parts and recommended spare parts

The table shows replaceable basic parts and recommended spare parts for the computer.

| List Ident. | Part Name | Recommended as Spare Part | Part Number |
|---|---|---|---|
| 1 | Power Supply Unit | X | 368464 |
| 2 | Motherboard | | 368463 |
| 3 | HDD Western Digital Scorpio Black 500GB 2,5" SATA 3GB/s 16M<br>used as data storage in HS/DP Recorder | X | 367527 |
| 4 | HDD Western Scorpio Black 750GB<br>used as data storage in the MP8200H model | X | 369373 |
| 5 | System disc: MICRON C400 128GB 2,5" SSD | X | 367360 |
| 6 | 16 x DVD-RW drive | | 368465 |
| 7 | Memory, 2GB, PC3–10600, DDR3–1333MHz | X | 368468 |
| 8 | Processor heat sink assembly | | 368462 |
| 9 | CPU Intel Core i5–2400 64 bit Quad C.3.1 GHz | | 368466 |
| 10 | HP Parallel Port Adapter | | 328805 |
| 11 | HP NC360T PCIe Dual Port Gigabit Server Adapter 10/100/1000 Mbps | | 367535 |
| 12 | Serial Port 2ND | | 328815 |
| 13 | 2-screen graphic card; Matrox Millenium P690 LP PCI x16, P69–MDDE128LPF (for NAV model) | | 328825 |

| List Ident. | Part Name | Recommended as Spare Part | Part Number |
|---|---|---|---|
| 14 | MATROX Quad Graphic Card M9148 LP PCIe x 16 | | 367536 |
| 15 | MATROX EXTIO F2408E PCIe Fibre Interface Card, XT02A-FESLPAF | | 367537 |
| 16 | RIC2 Card, low profile (optional for MP8200 NAV) | | 6200455 |
| 17 | Drive Module for two 2.5” sata HDD, ST-2221SATA | | 328831 |
| 18 | Display port adapter: HP DisplayPort To DVI-D Adapter, KV902AV | | 328832 |
| 19 | Serial interface; BlueStorm /LP Universal PCI serial card; 8 ports switchable RS232/422/485. BLG041–01 | | 337533 |
| 20 | LAN Kit MP7900 LAN/CAN model | | 357584 |
| 21 | MATROX EXTIO F2808 without LAN CARD | | 367533 |

# Consumables

| List Ident. | Part Name | Recommended as Spare Part | Part Number |
|---|---|---|---|
| 1 | Filter for MP8200 computer, for LAN/CAN model | X | 365703 |
| 2 | XP image | | 367541 |