ESAOTE S.p.A.

January 2006

Rev.A

SERVICE MANUAL

8310061000

Introduction

This manual describes for the Service technicians the 6150 (and 6100) system functions and the block diagram of the boards that implements these functions.

The manual is addressed to all the Service centres directly authorised by ESAOTE. All the operations described in this manual are not critical from a safety point of view.

Chapters Overview

This Service Manual is composed of the following chapters:

- Chapter 1: Introduction
- Chapter 2: System overview
- Chapter 3: Disassembling the unit
- Chapter 4: Block Diagrams
- Chapter 5: MyLab70 Probes
- Chapter 6: Traceable Parts
- Chapter 7: Part Lists
- Chapter 8: Troubleshooting
- Chapter 9: Installation and planned maintenance notes
- Chapter 10: Protection against electrostatic discharges
- Chapter 11: Software Installation
- Chapter 12: DICOM Connection
- Chapter 13: Safety Test
- Appendix A: Hardware Modifications
- Appendix B: Peripherals

In this manual a **WARNING** pertains to possible injury to the operator. A **CAUTION** describes the precautions which are necessary to protect the equipment. **Be sure that you understand and observe each of the cautions and warnings.**

Chapter 1

Introduction

MyLab 70 and **MyLab Gold Platform** (now indicated all as **MyLab**) are a multipurpose ultrasound system designed to perform radiology, cardiac and vascular exams. It has several operating modes and several probes formats through either standard features or optional upgrades.

MyLab design is based on the use of modular, functionally isolated printed circuit boards (PCBs) and subassemblies known as Field Repraceable Unit. This modularization greatly simplifies on-site service and repair. In most cases, on-site maintenance is accomplished by removing and replacing the PCBs or subassemblies.

According the type of system and its configuration, it can offer the following features:

B-Mode Imaging (Bi-dimensional)
M-Mode Imaging (Mono-dimensional)
Pulsed Wave Doppler
Continuous Wave Doppler
ECG
Digital FFT
Color flow mapping
TEI
X-RES
Archive to store images (Biolab)

The instrument is fully integrated and can be upgraded to a complete range of clinical applications.

Operating modes

MyLab displays ultrasound information in several operating modes. The modes available to the user depend on the option installed on the system and the probes used.

2-D Imaging mode

In 2-D imaging mode (called also B-Mode), the system displays a two dimensional image of the tissue that lies within the scan plane. Because the

system displays 2D images in real-time, the motion of the organ can be observed.

In B-Mode the depth and the field of view can be varied as well as the frequency and the processing of the image in order to provide more information contents for greater diagnostic capability.

Spectral Doppler modes

Doppler capability allows monitoring blood flow through vessel or within the heart. In spectral Doppler modes the system graphs both the direction and velocity of blood flow on a spectral display.

In pulse Wave Doppler the user selects the vessel of interest by positioning a Doppler cursor within the 2D image. Pulse Wave Doppler displays velocities within the range bounded by the Doppler gate on the cursor. The unit can simultaneously display the B-Mode image and Doppler spectral information, or independently display Doppler spectral information.

The Continuous-wave (CW) Doppler, the simplest mode, receives flow information from all the moving reflectors in the path of the beam (selected on the screen with the beam line) and is not depth selective. Therefore, CW Doppler is able to provide the V max (the maximum velocity through the sample area). Pulsed-wave (PW) Doppler, in contrast, cannot be used for higher velocities.

Color Doppler Imaging Mode

Color Doppler Imaging mode allows real time spatial visualization of the blood flow velocity patterns in the vessels. Color Doppler information is displayed within the B-Mode image. Blood flow towards the transducer appears in one color (Red) and flow away from the transducer appears in another color (Blue). The color representation is an estimate of the mean velocity at the sample area. The equipment can combine Doppler to display B-Mode, Color Mode, and Spectral Doppler information or B-Mode, Color Mode and M-Mode information at the same time.

M-Mode

In M-Mode the system displays a graphic representation of the selected line of interest within the B-Mode display. M-mode displays a graph that shows how the line selected changes over time.

Following basic precautions

Servicing the system shall only be conducted by Esaote trained service provider. Lethal voltages are present inside **MyLab**. Use caution when opening the unit.

Always consult the User Manual for proper use and operation of the system.

The system requires proper care and cleaning. System care includes periodic inspections, cleaning and sanitizing the system.

Transducers require proper handling, care and cleaning. Transducer care includes daily inspection, daily cleaning, disinfecting and sterilization whenever necessary.

In particular:

- Do not drop the transducer. Dropping the transducer against a hard surface can damage the transducer elements and acoustic lens and damage the electrical safety features.
- Do not use a broken transducer. It may present a danger of electric shock.
- Do not pinch or kink the transducer cable. If the transducer housing becomes broken or if there are cuts in the cable, the electrical safety features of the transducer could be compromised.

When the system has to be moved, move it carefully. In particular pay attention when moving it along inclined passages.

Observe the following precautions when moving the system.

- Turn the system off and disconnect the power cord and any other cord.
- Remove all the probes and place them in a safe place, or at least, be sure that the transducer cables are away from the wheels before moving the system.
- Unlock the wheels before moving the system.
- Do not allow the system to strike walls or doorframes.

Identifying Boards type and revision

Printed circuit boards are identified by board type, part number and Index of configuration (IC).

The board type indicates the board's major function. The type is abbreviated into few letters acronym.

To each board is assigned a code, that is the part number of that board.

The Index of configuration indicates the level of revision, both software and hardware.

When new modifications in hardware or software of PLD components of the boards will be introduced, the number indicates in the label of figure 1 will increase.

Every modification to the IC will be communicated from the Service DPT.

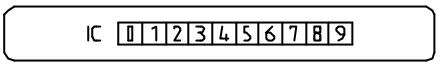


Figure 1

All these data are written in labels placed on the board.

Chapter 2

System overview

This chapter will introduce **MyLab70** and **MyLab Gold Platform** (now indicated all as **MyLab**) units.

Configuration

This table summarize the **MyLab Gold Platform** codes, modules and performances.

CODE	ITEMS DESCRIPTION	NOTES
9806100000	MyLab Gold Platform Digital Ultrasound Ecotomograph	
8820028000	Euro 16A 250V L=2m	Power cords
8820077000	H.G. 15A 250V L=2m	
8820078000	Italian 16A 250V L=2m	
9102923100	Power supply 230V	Power supply standard
9102923101	Power supply 115V	
8370202000	Video PAL	Video Standard
8370202100	Video NTSC	
8610274001	Vascular Licence	Application Licences
8610274002	General Imaging (including ABDOMINAL, THYROID, SMALL PARTS, MUSCULOSKELETAL, BREAST, NEONATAL, PEDIATRIC, UROLOGY)	
8610274004	Ob/Gyn Licence	
8610273009	Dicom Licence	Option Licences
9102909010	VTR Cable set	Peripheral Cables
9102910010	BW printer Cable set	
9102911010	RGB printer Cable set	
8830749000	USB Cable	
9102756000	Freeze Footswitch	ECG Cables-Various
8610264000	MyLab Service Key	

This table summarize the **MyLab70** codes, modules and performances.

CODE	ITEMS DESCRIPTION	NOTES
9806150000	MyLab 70 Digital Ultrasound Ecotomograph	
8820028000	Euro 16A 250V L=2m	Power cords
8820077000	H.G. 15A 250V L=2m	
8820078000	Italian 16A 250V L=2m	
9102923150	Power supply 230V	Power supply standard
9102923151	Power supply 115V	
8370202000	Video PAL	Video Standard
8370202100	Video NTSC	
9102572000	Standard Processing	PC Units
9102572500	X-View Processing	
8610273001	Vascular Licence	Application Licences
8610273002	General Imaging (including ABDOMINAL, THYROID, SMALL PARTS, MUSCULOSKELETAL, BREAST, NEONATAL, PEDIATRIC, UROLOGY)	
8610273004	Ob/Gyn Licence	
8610273009	Dicom Licence	Option Licences
9102909010	VTR Cable set	Peripheral Cables
9102910010	BW printer Cable set	
9102911010	RGB printer Cable set	
8830749000	USB Cable	
9102756000	Freeze Footswitch	ECG Cables-Various
8610264000	MyLab Service Key	

System Description

The system consists of a control panel assembly with the monitor, and a console with the system electronics and connectors.

The console top is equipped to house video peripherals. It has a rear mains switch to power up the console, display and peripheral units. For transportation, the system provides a handle (control panel front) and brakes (front wheels).

Control Panel Assembly

The control panel assembly includes the unit handle, all system controls, including an ON/OFF button, the loud speakers, probe and gel holders (right side), and probe and ECG cables holders on the left.

This assembly can be rotated for optimal orientation for the operator and for transportation.

Console

Probe Connectors

Probes connectors are located on the front of the system (right side); three (four in **MyLab Gold Platform**) imaging and one Doppler probe connectors are available.

Imaging probes can be connected to the rectangular connectors (EA1, EA2, EA3 or EA4) ; the Doppler probe has its own dedicated connector (D).

Probe connection procedure: make sure that the connector-securing device is in the "OPEN" position, align the pins of the two connectors and carefully attach the probe connector. To secure it, move the securing device to its "LOCK" position. To connect a Doppler probe, attach the connector with the reference facing up.

CAUTION

Never disconnect the probe while it is active. Press the FREEZE key before disconnecting the probe.

USB Ports

Two USB ports are located on the front of the system (left side); these ports can be used to connect a USB printer or a USB pen key for digital data storage.

CD/DVD

A combo device (**MyLab70**) and a DVD writer (**MyLab Gold Platform**) are available on the front of the system (left side); this driver allows the operator to burn data on CD and DVD (only for MyLab Gold Platform) or to read data from a CD and a DVD (for the combo).

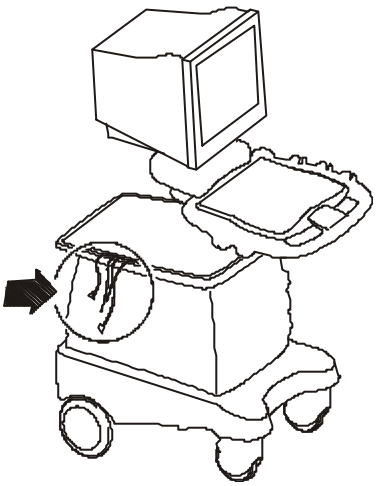
Power Plug

The power cord plug, the fuse box and the electrical power switch (mains switch) are located on the bottom of the system, at the rear.

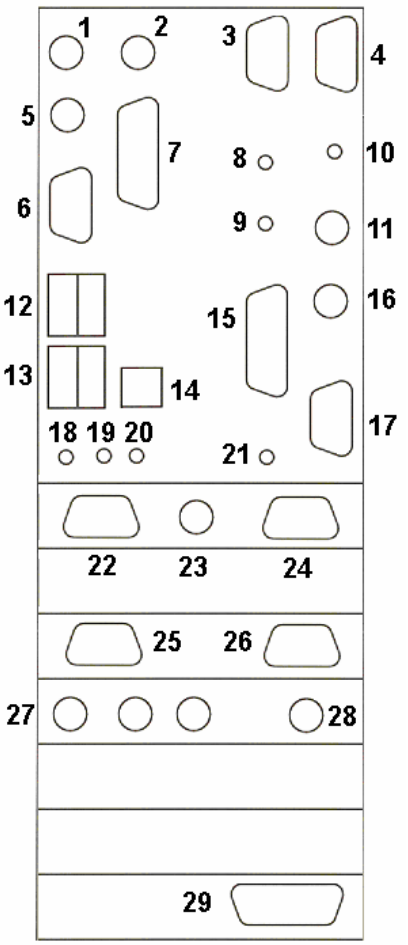
Wheels

The posterior wheels are permanently fixed; anterior wheels are rotational. Each anterior wheel has two levers to lock (grey to brake and green to lock the rotational mechanism) and one on top to release.

Peripherals Housing



The console top is equipped to house two video peripherals (for example a printer and a VTR); peripherals can be easily connected and disconnected via the pre-installed cables (shown in the drawing at the left) and secured to the system console with belts.



MyLab Connectors

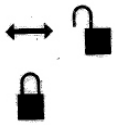
1. Keyboard
2. Mouse
3. Pedal
4. Reserved
5. Reserved
6. Serial port for VTR remote control
7. Parallel port
8. Audio out to the VTR
9. Audio in from sound card (18)
10. Remote Control for video printers
11. C-Video out for B/W and color Video Printer
12. Two USB ports
13. Two USB ports one of which free for connection of USB printers
14. RJ45 LAN port
15. Keyboard control
16. S-Video out for VTR or Color Video Printer
17. Auxiliary VGA video out
18. Microphone in from the front of the system (left side)
19. Audio out to the audio in (9)
20. Audio in from VTR
21. Headphones Audio out to the front of the system (left side)
22. PC video out to 25
23. Reserved
24. Reserved
25. PC video in from 22
26. Video out to monitor
27. Reserved, three connectors
28. S-Video in from VTR
29. ECG

Control Panel Assembly Orientation

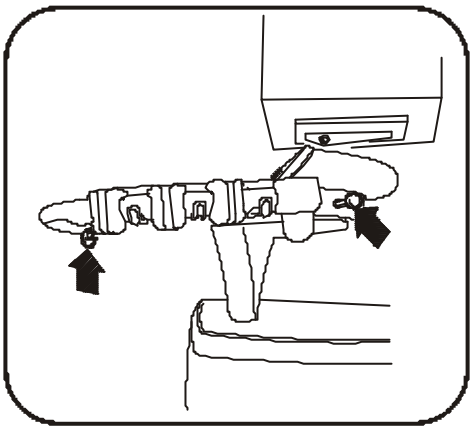
System closed position

This assembly can be laterally oriented to maximize operator comfort; also, it can be tilted toward the back of the system for optimal maneuverability (closed position).

These two rotations are controlled by locks located below the control panel (as shown in the drawing below).



The anterior locking device is used to rotate the assembly into its optimal working position: when pushed, this device allows lateral rotation of the assembly (i.e., control panel and display). The posterior lock is used to rotate the assembly by 180°, so that the handle moves to the rear of the system, for optimal transportation.



To the right of the locking device a lever allows to lift or let down the keyboard.

How to install the system

At the examination site, place the control panel assembly into its working position (unlock the posterior locking device and rotate the assembly by 180°); unlock the anterior wheels (green levers) for final position adjustments.

Check that the correct options line voltage (fuses on the power supply) is set. In units where it's present the manual switch to set the line voltage, before turn them on check that it's set to the correct line voltage. Once the unit is on check also the Video Standard one.

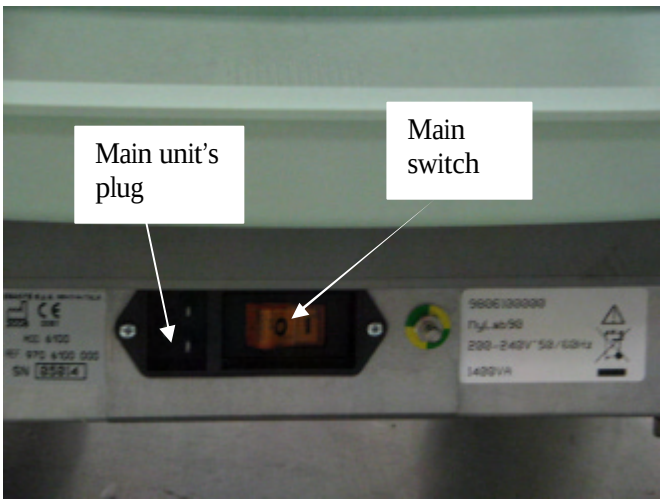
Assembly of the monitor

The unit is sent with the monitor not assembled.

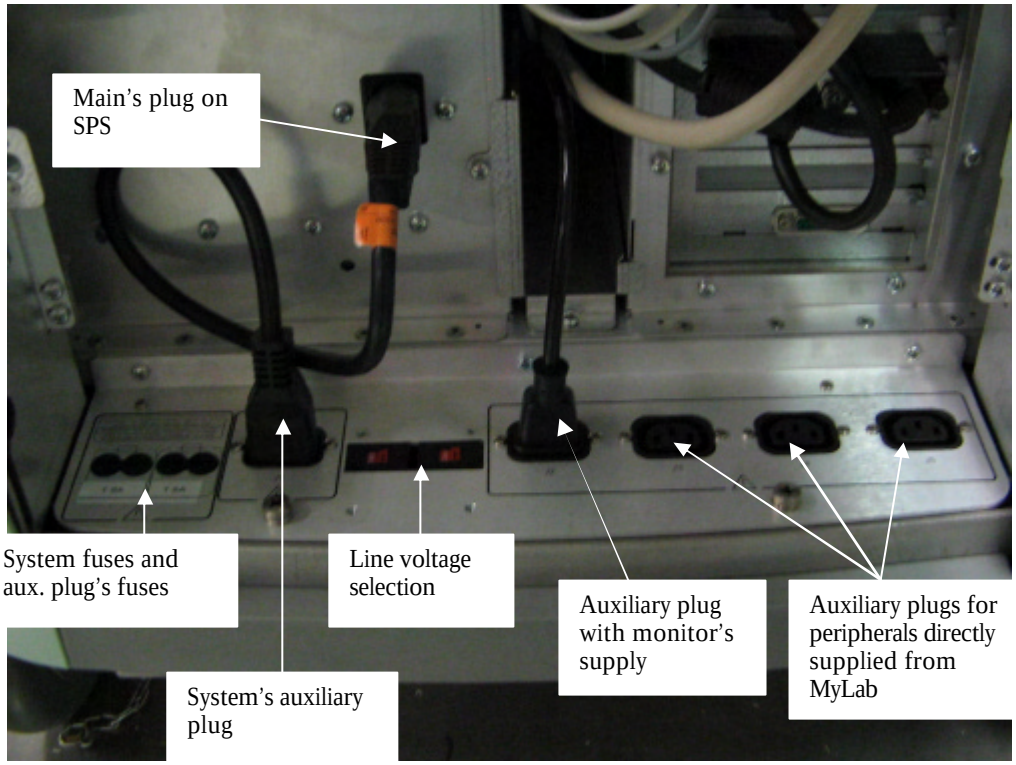
To install it is sufficient to follows the instructions described in the chapter 3.

Switch on and off

- Plug the power cord found in the package in the Main unit's power supply plug (see next image) and then to a socket.



- Switch on the main switch located in the power supply.
- Push the ON/OFF button located in the frontal side of the unit (on the right side above the TGC controls). The ON/OFF Switch is located in the right upper corner of the control panel.
- Wait till the system performs its start-up (Windows XP and **MyLab** programs).
- Select a probe, an application and a preset.



To switch the unit off:

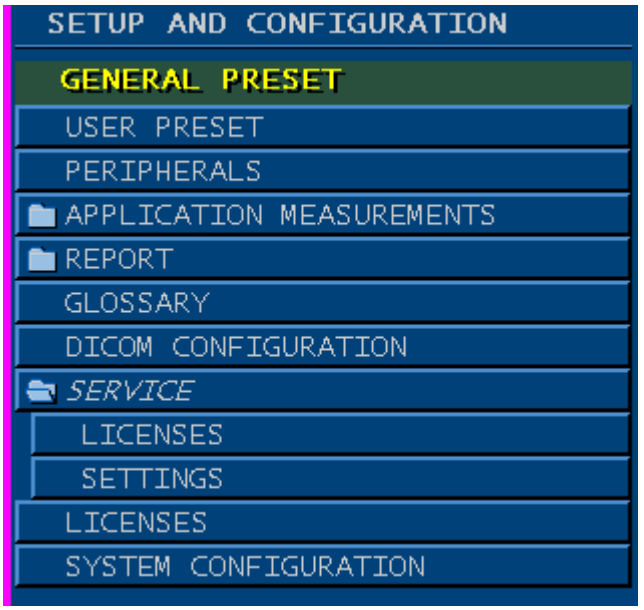
- Push the ON/OFF button, the system shut down automatically all the programs and then, after few seconds, switch it off. In this condition the unit is in stand-by. To switch it on again it's sufficient to push the ON/OFF button again.

NOTE

For servicing on the unit, is necessary to turn off also the main switch in the power supply, and to remove the power supply cord from the plug.

Configuration Menu

The MENU key provides access to the system menu. The system displays the following possible options.



Some menu options are arranged in groups (identified by the symbol). To display the options included in a group, position the cursor on the group and press ENTER.

General Preset

The available options are internally organized in folders. To access the individual folders, position the trackball on the required folder and press ENTER.

Keyboard

Keyboard enables the operator to change the Echograph Light, the Softkeys Light, the LCD Contrast and the LCD Backlight via four different sliders.

Date/Time

Date/Time enables the operator to change the date and time, and to select the required data and time formats (12 or 24 hour).

Center

Center is used for inputting the name of the center, which will then be shown on the screen.

Video

Video is used for selecting the required video standard (PAL or NTSC) and the video signal (S-VHS or VHS).

User Preset

This item allows the user to cancel an existing preset (DELETE PRESET option).

Peripherals

The system can remotely control (with keys **1, 2** and **3**) recording by VTR (for specific models) and printing (in B&W and color).

The menu also enables the operator to select the required print format. The set printing format icon is displayed next to the relevant printer symbol, in the heading bar.

Application Measurements

This option allows configuration of the available measurement packages by using the **MEASURE** key. **MyLab** allows programming of different packages for each application. For each measurement group, a description may be entered and the derived measurement enable.

Report

MyLab offers different menus allowing configuration of the desired report.

Glossary

When in annotation mode, the system allows the user to enter pre-existing sentences or words. Through this option, applications libraries of words can be created.

Dicom Configuration

This option allows to configure the Dicom Server to which the **MyLab** is connected.

Service

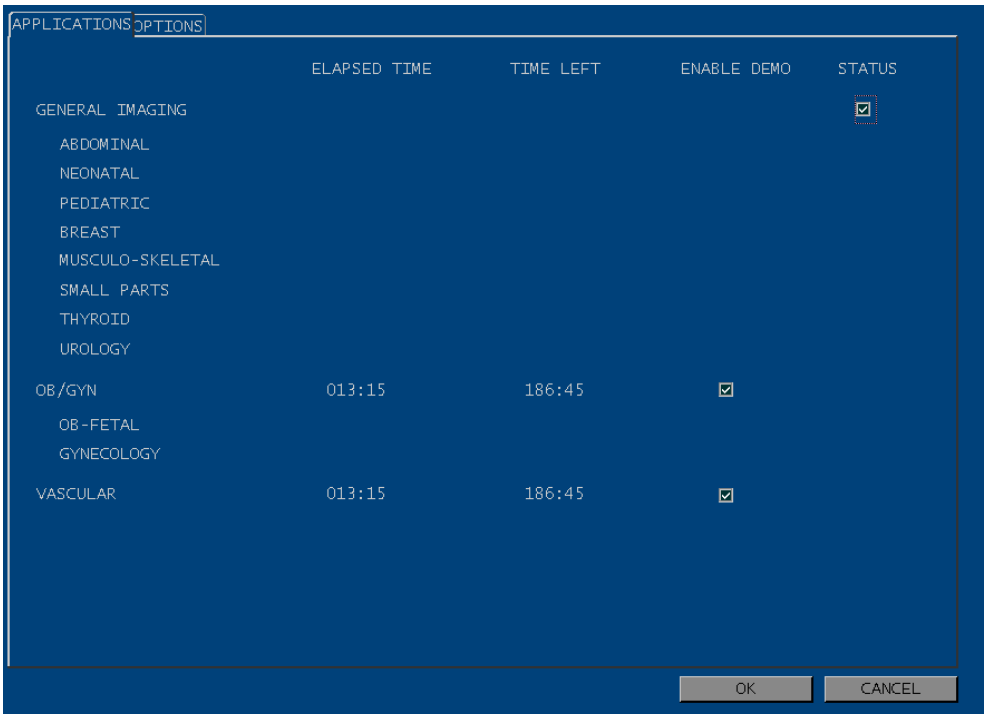
This option is organized in two folders. To access the individual folders, position the trackball on the required folder and press **ENTER**.

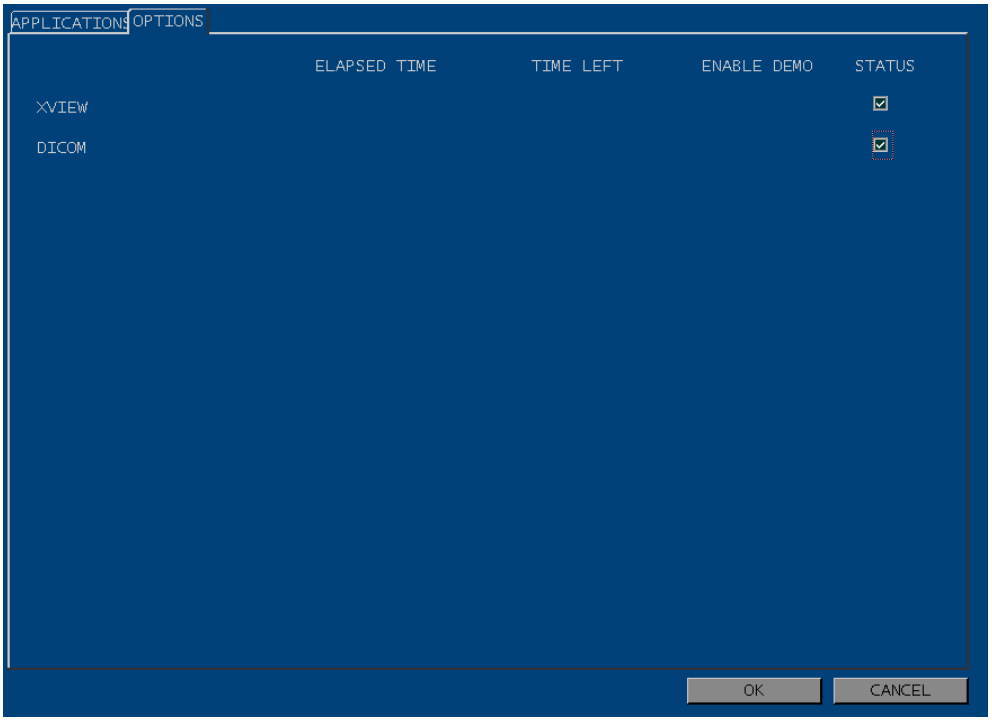
Licenses

This procedure enables activation of the available Demo licenses and, when necessary, to disable licenses. Demo licenses last two hundreds (200) working hours before expiring; once expired, it can not be re-activated. If a Demo license is installed, it is possible to check its expiring date.

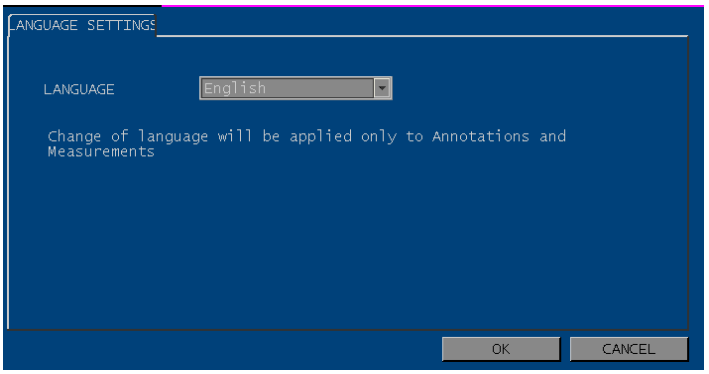
To activate a demo license position the trackball on the desired enable demo checkbox and press ENTER to confirm. Use the same procedure to disable licenses.

The Status checkbox is displayed only if a license has been acquired and it allows to disable the selected license.





Settings:
Once entered the SETTINGS option, the system displays:



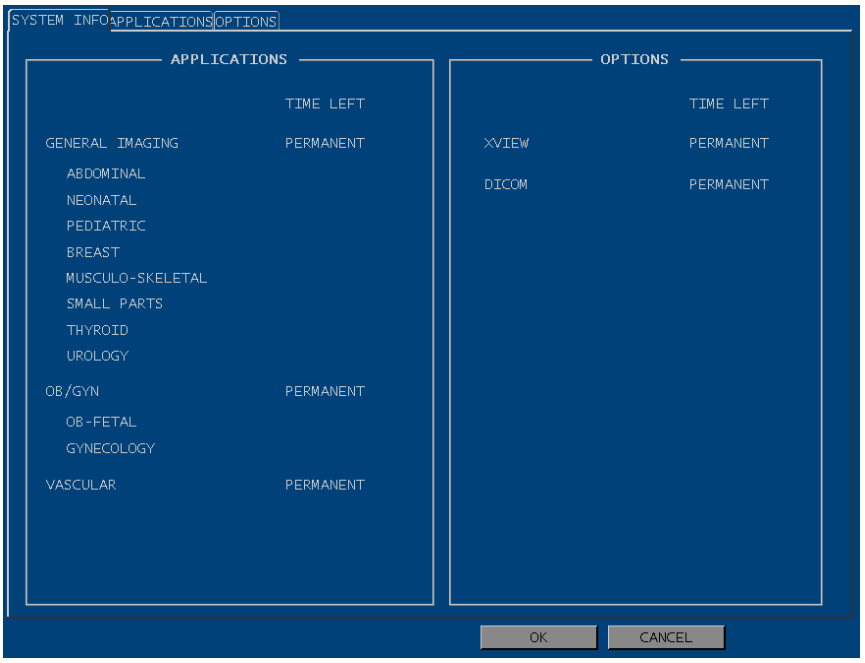
The Language Settings folder is used for choosing the default language. One of the following languages can be set:

- English
- Italian
- French
- German
- Spanish

Licenses

The license number can be input from this folder. The license comes into operation at the next power up. This option is organized in three tabs.

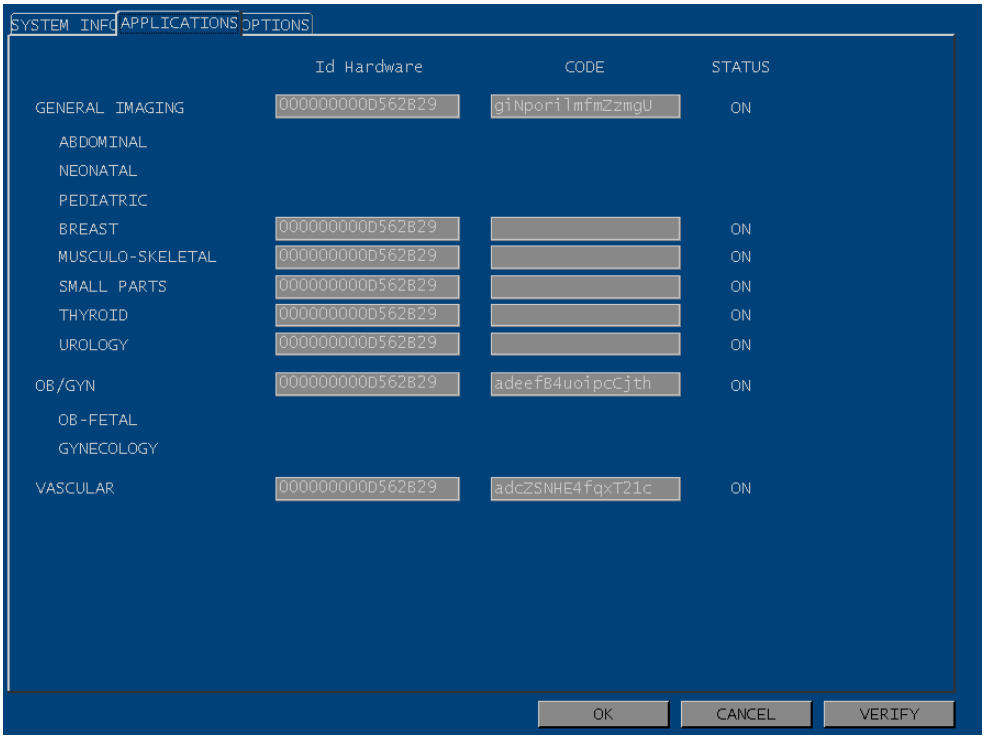
System info
Summarize the status of the licenses.



Applications

This tab shows the ID hardware of the system related to the ID button. The license passwords are generated according to this number. To activate a license write down the password in the field code and press Verify, if the number is correct the status change to on. Note that the system is case sensitive.

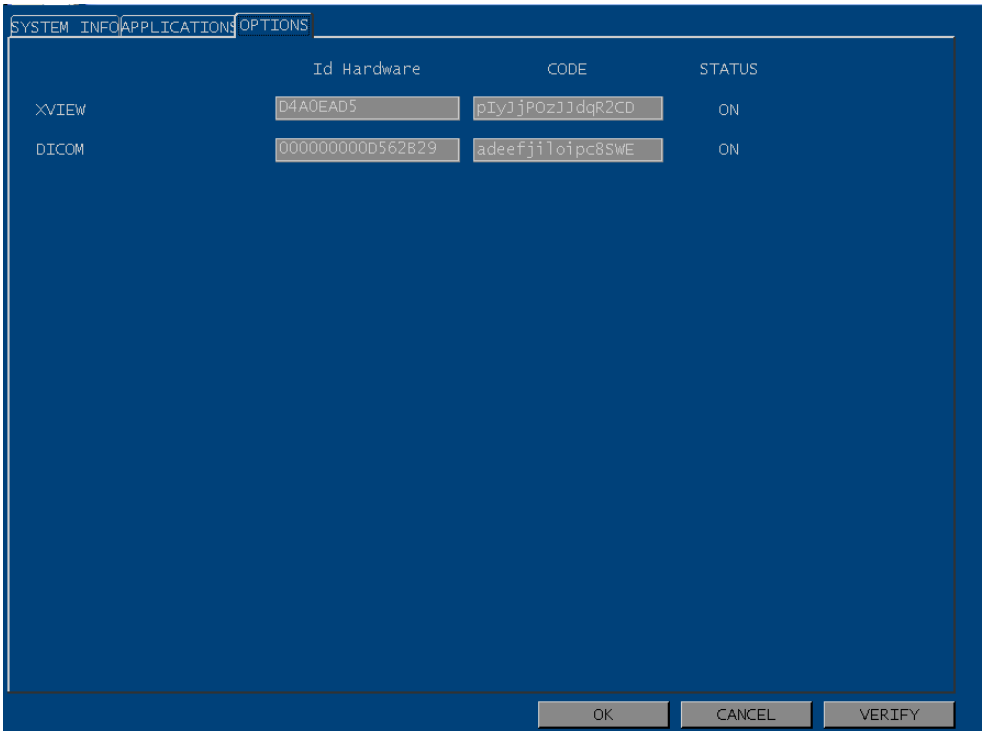
In case of a demo license has been activated in the tab are shown the elapsed time and the time left.



Options

This tab shows two different ID hardware. The first, related to the MAC address, is used to generate the password for X-View license; the second, related to the ID button, is used to generate the password for Dicom license. To activate a license write down the password in the field code and press Verify, if the number is correct the status change to on. Note that the system is case sensitive.

In case of a demo license has been activated in the tab are shown the elapsed time and the time left.



How to check the system and control the standard quality

To verify the level of performances, the following procedures are requested:

- Looking for the standard
- Setting the monitor
- Control the imaging quality: lateral resolution, axial resolution with phantom
- Control contrast resolution
- Control Doppler sensitivity
- Control Color sensitivity

Looking for the standard

With CA621 probe connected and located on the probe holder, turn ON the power, select the GENERAL preset.

Set the system in the following conditions:

1. General Gain MAX
2. TGC Gain MAX
3. Doppler Gain MAX
4. Color Gain MAX
5. B-Mode angle MAX

The image shown should not present the following problems:

a) Random spike
b) Black shadow cone
c) High level of background noise

In Doppler mode the spectral display should not present:

a) Fix white tone
b) White spurious signal
c) High level shift noise

In color mode set the box in the lower part of the imaging.

In the box the color should be displayed with:

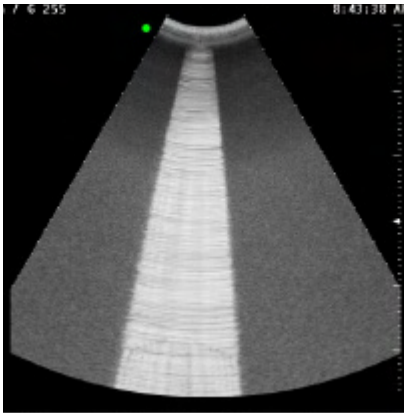
a) Multicolor imaging, without random vertical spike with different intensity
b) The colors have to be only in the box and not out of it.

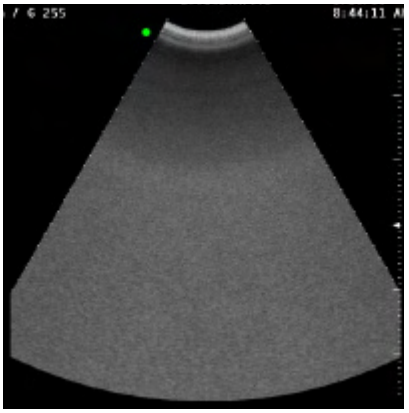
With 2D image only put the image at the maximum dept and angle, and select only one focus (the deeper).

Using a thin blade with thickness about 1 mm, move it on the external surface of the array's transducer see next figure.

At the same time on the monitor will appear a white shadow cone. This shadow must be continuous from the beginning of the array to the end. See next figure.

Put the probe in the probe holder, than look the image on the monitor, in this condition, you have to see the ultrasound image as shown in next figure.





Control the imaging quality: lateral resolution, axial resolution with phantom

The most important feature of an ultrasound device is to show in the clearest way the reality of the organs under examination.

This capability depends on the various resolutions of the system.

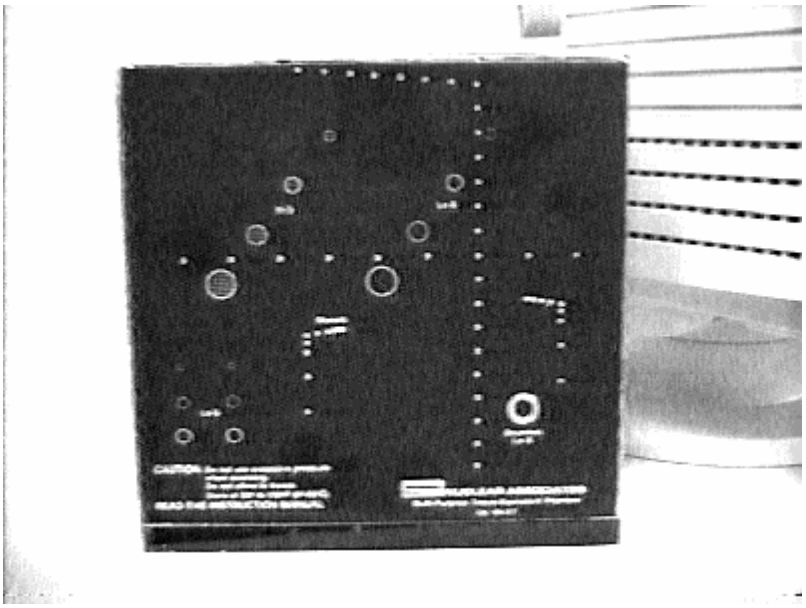
Phantom overview

The phantom is made of tissue mimicking gel and provides an effective means of monitoring the image quality of an ultrasound system.

Ultrasound systems can be checked easily for linearity, axial and lateral resolution, Doppler sensitivity, color sensitivity and depth-marker geometry.

In order to check the image quality it is necessary to have a phantom.

In next figure there is an example of an ultrasound phantom.



Positioning the probe on the phantom

- Connect the probe LA 523 to **MyLab Gold Platform** and switch it on.
- Put the image Gain at the medium level.
- TGC control at the medium level.
- Place with a probe holder the probe on the Phantom.

An initial scan of tissue mimicking phantoms is done in order to adjust the receiver sensitivity controls properly.

This should be set so that a uniform grey scale texture is obtained as far as possible into phantom.

Before starting the trial it is necessary to check if the Phantom is properly oriented.

Proper orientation includes:

a) Be sure that the image plane is parallel to the sidewalls of the phantom

b) Adjust the scan plane tilt so that the image plane is perpendicular to the reflectors in the phantom.

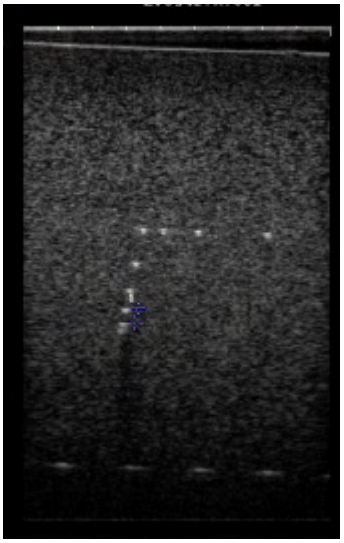
Tilt adjustment may be done by maximizing the echo signals US imaging originating from line reflectors situated in the focal region of the transducer beam.

Meaningful tests of both Axial and Lateral resolution require more pertinent procedures, since measurement results are a function of sensitivity control settings of the instrument.

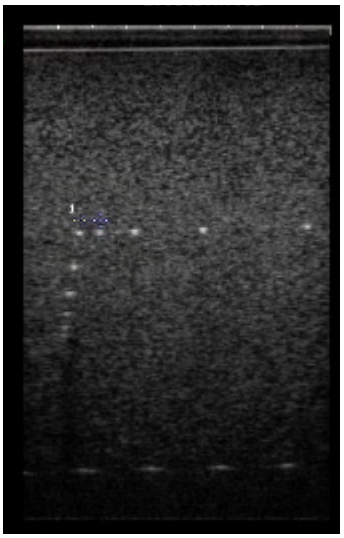
The target of the resolution tests is to obtain measurements with sensitivity controls (TGC) adjusted to some standard level greater than the level usually required for obtaining good normal images while scanning. The Nylon line reflectors in the phantom are used for this test.

The Phantom's reflectors are attainable at the sensitivity level to which they are just well discernible on the display.

In order to verify the axial resolution, it is necessary to distinguish at least two reflectors on the ultrasound beam propagation axis, with the quality shown in next figure.



In order to verify the Lateral resolution, it is necessary to distinguish at least two reflectors targets which are perpendicular to the propagation ultrasound beam, the quality has to be as shown in next figure.



Control contrast resolution

The contrast resolution is the capability of an ultrasound system to recognize two near zones with different acoustic impedance.

The concept of similarity is concerned when there are two areas with similar structures; similar structures mean similar acoustic echoes when hit by an ultrasound beam.

The best the contrast resolution the best the capability of the system to recognize reflected echoes at a very low intensity.

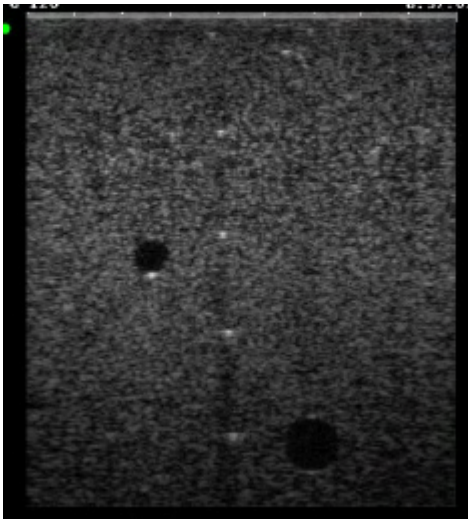
For this control it necessary to follow this procedure:

- Switch on the **MyLab** unit.
- Connect a probe to the unit
- Select the Image Gain and TGC control at the medium level.
- Select the maximum number of focuses.
- Move the focus in the area where you want to perform the image.

For this test it is possible to use The RMI CONTRAST PHANTOM.

Instead of using phantom contrast resolution it is possible, in order to evaluate if the system is working well, to produce by you an image of the liver and the nearby parenchyma. Only by personal experience it will be

possible to evaluate if the system that you are using is correctly set (in next figure an image on phantom)



Control Doppler sensitivity

- Switch the unit on.
- Place the probe on the Doppler Phantom using a probe holder.

An initial scan of tissue mimicking phantoms is made in order to adjust the receiver sensitivity controls properly.

The receiver sensitivity controls should be set in order that a uniform grey scale is obtained as far as possible in the phantom reflector(s).

Before starting with the trial it is necessary to check if the Phantom is properly oriented.

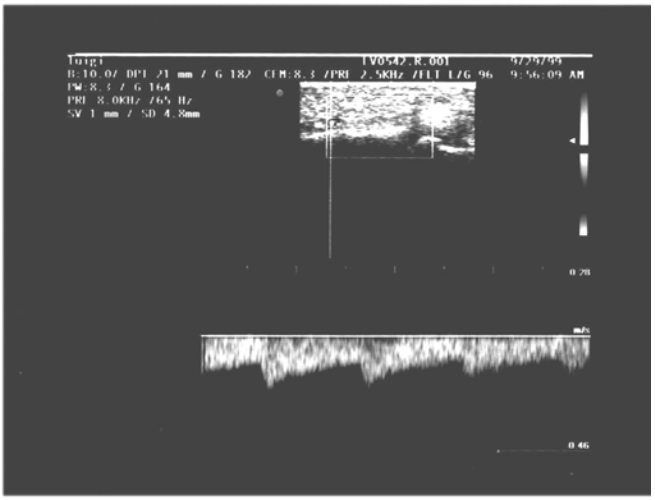
The Doppler sensitivity test must quantify the ability of the system to detect ultrasonic echoes originating at a certain depth. A very good estimation of the sensitivity can be determined under clinical evaluation.

Basically this test entails scanning the phantom's 45 degree angled simulated blood vessel at different depths and watching on the monitor the Doppler level at different depths.

The sample volume test is the accuracy by which a Doppler unit places an electronically generated video gate on a region of interest.

Moving the gate while scanning carries out this test.

A properly functioning Doppler unit will detect very little Doppler signal when the gate is positioned outside the region of interest of the image that corresponds to the vessel's lumen.



Another possibility to check the Doppler , is to find the Doppler spectrum on a finger ‘s vessel. In figure 45 is shown the result of this kind of check.

Next figure XX shows how to find the finger’s vessel in order to perform the Doppler scan.

Control Color Doppler Sensitivity

The sensitivity in Color refers to the instrument's ability to extract the maximum flow information from echoes and to allow the clinician to visualize the flow from the physiological point of view as well.

The system must accomplish to two important tasks, which are: reliability and accuracy, in faithful relationship to the B-mode image and body's anatomy, without introducing any artifacts at all.

Sensitivity refers to the quality of B-Mode and Doppler information within a certain range of depths allowed by the ultrasound beam penetration at a given frequency.

The evaluation of the Color sensitivity is acquired by referring to a personal experience method.

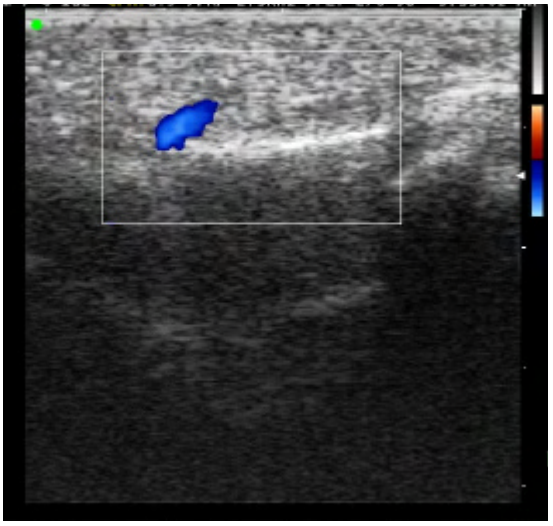
For an Ultrasound system it is more difficult to detect the low flow velocity; therefore for detecting the Color quality a little artery is suggested.

After connecting the unit with a High Frequency probe LA 424 try to visualize the color on your artery coming from a finger of your hand , and as a result you will have to see a good image with an artery dimension of 2-3.mm.

To achieve the previous results, it is necessary to set the system in the following condition:

- Set the Color gain around 100 (± 5) ; the B gain around 180 (± 10) ; the TGC at the medium level
- Set the minimum depth
- Set the B frequency at 10 MHz ; the CFM at 8.3 MHz
- Set the PRF at a value of.2.5 kHz
- Set the box window size according to the purpose.

On the monitor you will find an image that can be compared to the following



Chapter 3

Disassembling the unit

Tools and instruments

For the technical operations on **MyLab 70** and **Gold Platform** units **(now all indicated as MyLab-only in case of differences will be indicated the long name)**, like the installing steps, opening the system, operations on the boards, we suggest the kind of instruments and tools, which are necessary:

star screwdriver set
flat screwdriver set
allen spanners set;
ratchet spanners set;
digital multimeter

NOTE: All the operations described in the following pages must be done with the unit switched off, and with the power cord disconnected. When it will be necessary to connect the line voltage to the unit, it will be specified in the notes.

PROTECTION AGAINST ELECTROSTATIC DISCHARGES

Opening and servicing MyLab it's necessary to keep attention to the electrostatic sensible devices. In the unit are contained several boards and single components that can be damaged with electrostatic discharges.

In the chapter 10 are listed all the sensible parts and are indicated the procedures to handle them.

FIRST ELECTRICAL CONNECTIONS- PERIPHERALS ELECTRICAL CONNECTIONS

To start the unit it's necessary to connect the power supply cable and to turn on the main power switch on the unit.

They are positioned in the lower backside of the unit (see next pictures).

Also it's necessary to connect the supply from the Mains Power group to the SPS.

This is possible due to one auxiliary plug on the system, which supplies the SPS.

With one electrical cord the system's auxiliary plug is connected to the plug on the SPS board and sends to this board the line voltage (115 or 220 Vac).

All the plugs are accessible from the backside of the unit.

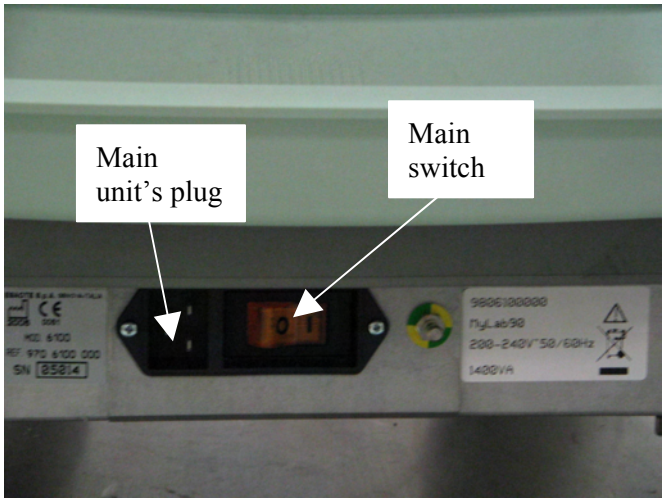


Figure 1.

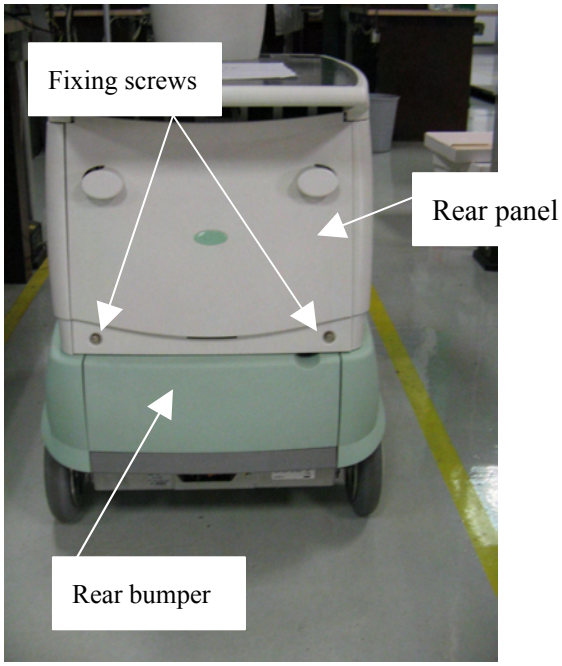


Figure 2.

It's necessary to open the rear panel and the rear bumper.

For the backside panel it's sufficient to turn 90 degrees the two backside fixing screws and to raise it from the bottom; the panel will remain opened.

The same for the backside bumper; it's sufficient to rise up and to open it as shown.

One of the four auxiliary plugs is used to supply the monitor (as shown in the next figure).

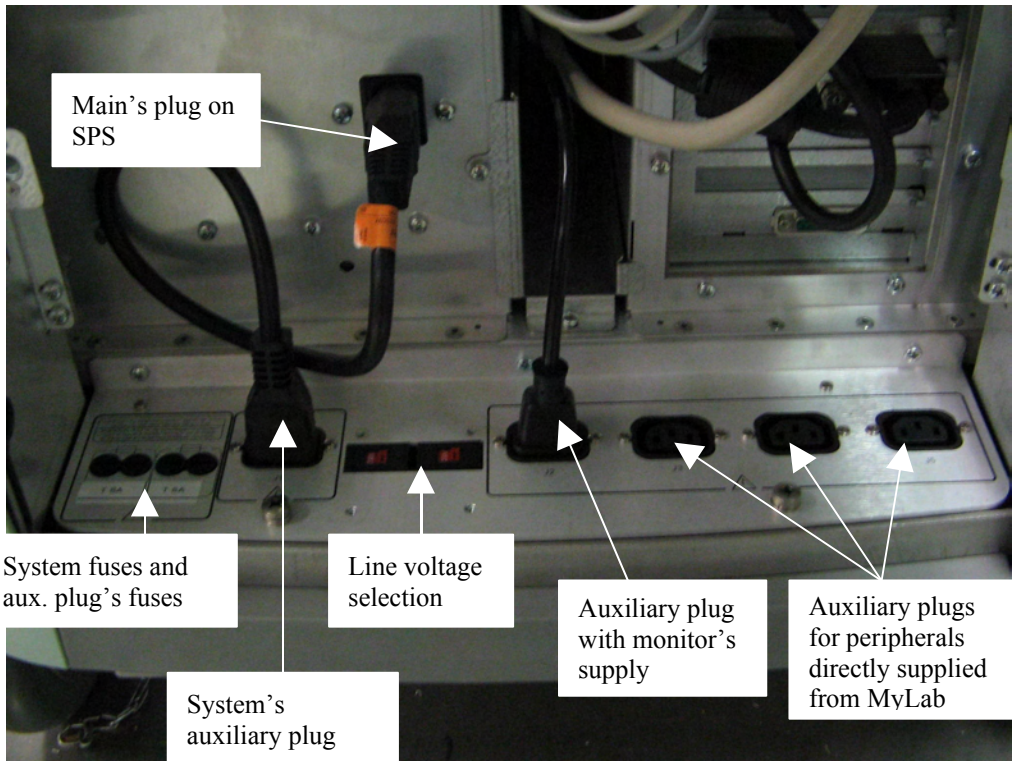


Figure 3.

The line voltage selectors, when the unit is set, are covered with a metallic plate in order to protect them, against not desired modifications (see figure Figure 4). On the panel is indicated the voltage set.

To access to them it's sufficient to unscrew the four screws which fix it.

Figure 4.

HOW TO REMOVE THE PLASTIC PANELS

Left and right side panels:
The mentioned plastic panels are not fixed with screws to the unit. To remove them it's sufficient to pull them gently. Proceed in the following way:

-raise the rear panel in order to keep better the two lateral panels

-pull the panels gently they are fixed with four pins which match four holes on the metallic chassis.

On the two sides there is the access to the system's board and to the PC group

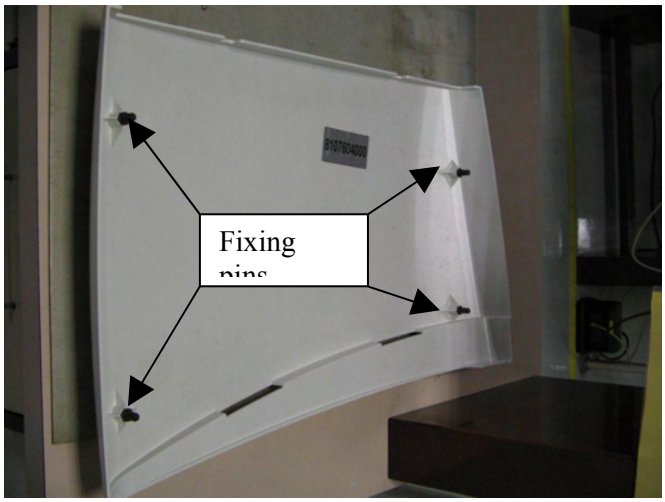


Figure 5. Left panel code 8107604000

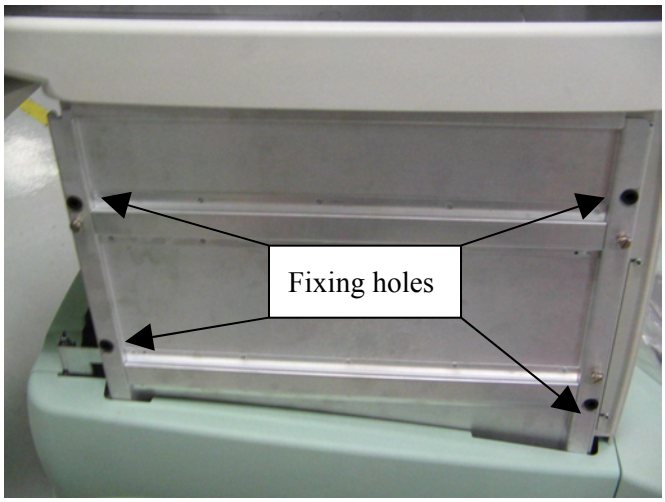


Figure 6.

To insert the panels it's sufficient to match the pins with the holes and to push gently the panel until it's fixed.

Lateral bumpers:
The plastic panels they are not fixed with screws to the unit.

The holding system is the same of the left and right panels: four pins on the bumper that matches four holes on the metallic chassis.

To remove the lateral bumper it's necessary to remove first its lateral panel, then pull gently the bumper until the fixing pins are out from the holes

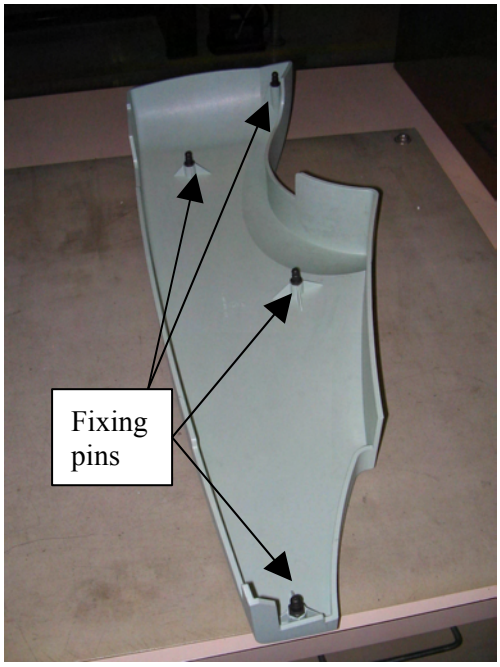


Figure 7.Left bumper code 8107600000

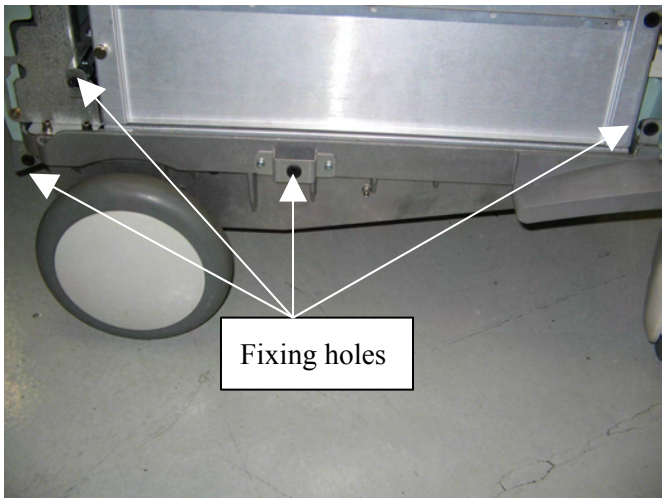


Figure 8.

To insert the bumper it's sufficient to match the pins with the holes and to push gently the bumper until it's fixed.

Upper group MyLab 70:
the upper group is composed by one superior metallic panel, which covers the plastic top cover. Under this metallic panel are positioned the cables to hold the peripherals to the system.

The metallic cover it's fixed to the plastic panels with four little magnets.

To remove it it's sufficient to raise it.

On the two sides there are two little metallic insert, also fixed with other two magnets.

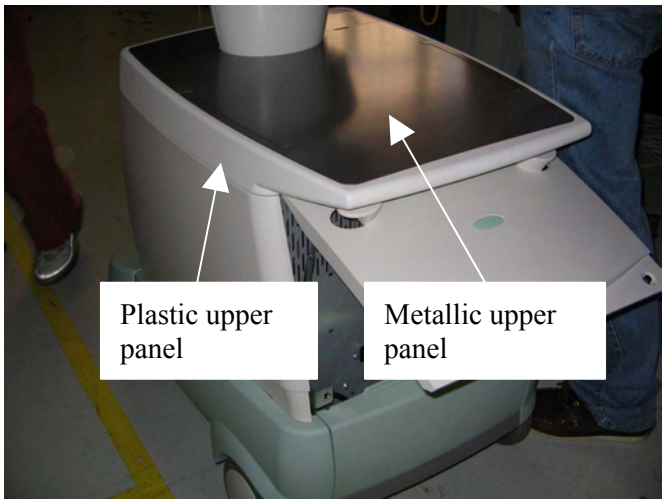


Figure 9.

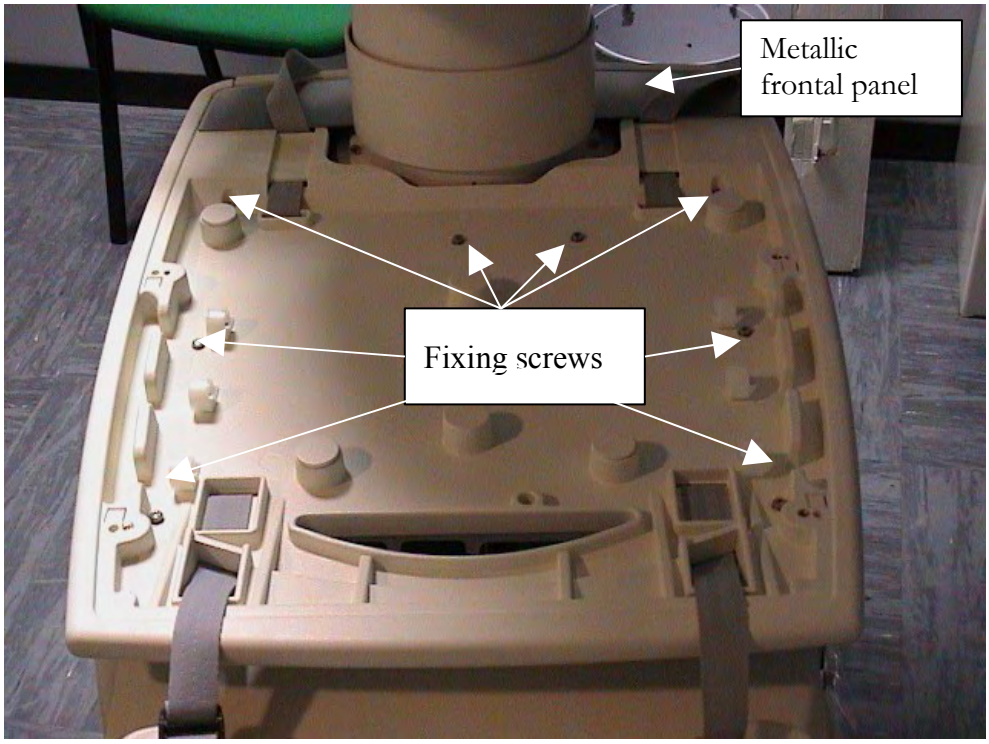


Figure 10.

To remove the plastic panels there are some screws which fix it to the metallic frame

The procedure to remove it is the following:

-Remove the screws which are accessible removing the metallic top cover (see Figure 11)

-remove the 2 screws which fix the little metallic panel placed in the frontal part. The two screws are accessible from the bottom (one in the left and one in the right side) so it's necessary to remove the left and right lateral panels (see next picture)

Figure 11.

After it's possible to remove the plastic upper cover, sliding it from the bottom.

Upper group MyLab Gold Platform:
the upper group for the MyLab Gold Platform is composed in the same way of the MyLab 70 but it's fixed in a different way.

The metallic cover it's fixed to the plastic panels with four little magnets.

To remove it it's sufficient to raise it.

On the two sides there are two little metallic insert, also fixed with other two magnets.

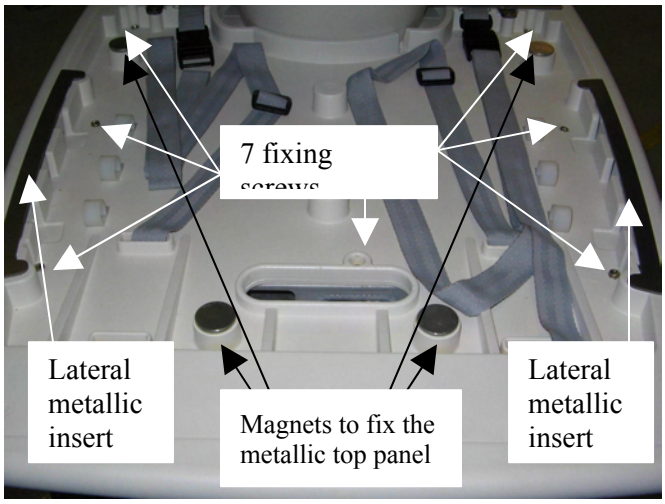


Figure 12.

To remove the plastic panels there are twelve screws which fix it to the metallic frame

The procedure to remove it is the following:

-Remove the seven screws which are accessible removing the metallic top cover (see Figure 12)

-remove the 4 screws which fix the plastic shells for the column (see the next pictures).

The rear shell covers another fixing screw, unscrewing the plastic basement it's free and it's possible to remove it from the backside.

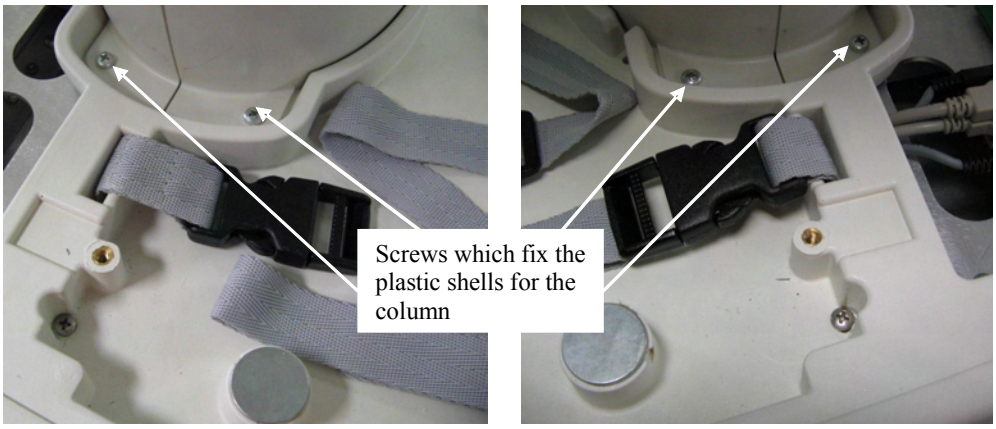


Figure 13.

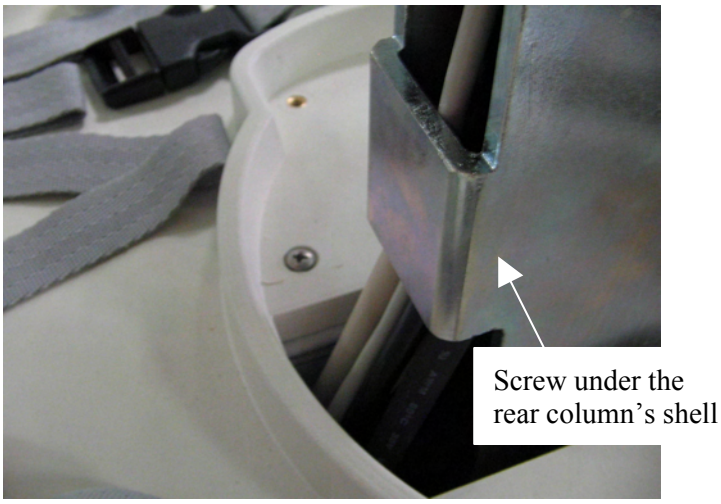


Figure 14.

Frontal panel:
the frontal panel is fixed to the unit with six screws: two for every side and two in the upper part of the panel

To remove it it's necessary proceed in the following way:

remove the left and right plastic panels to access to the lateral screws

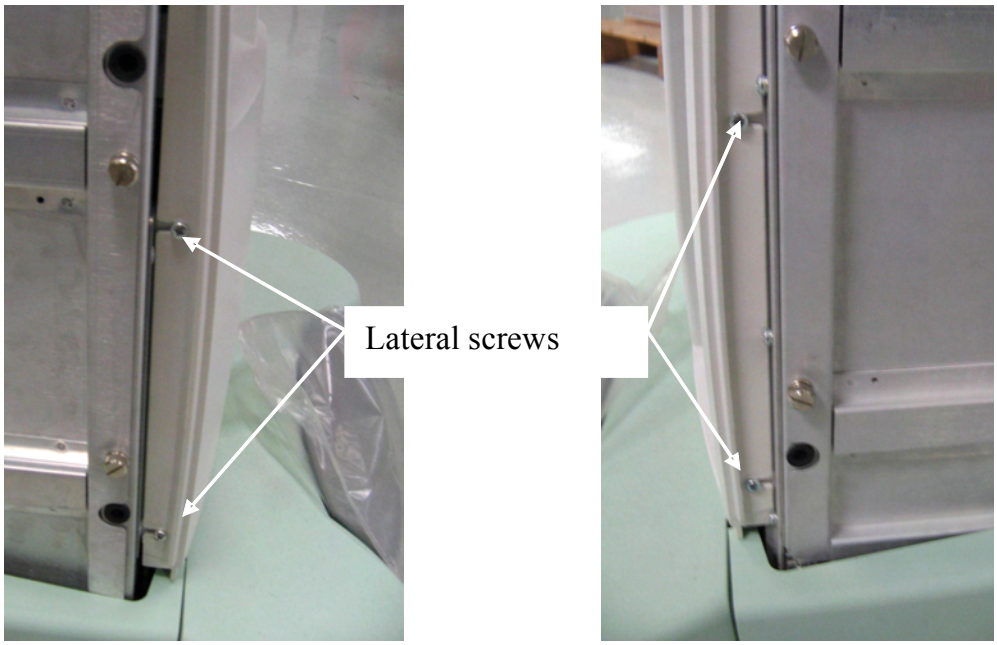


Figure 15.

To access to the upper screws it's necessary to remove the little metallic cover positioned in the frontal part of the unit.

The first step is to remove the metallic cover (as described before). Without the big metallic cover it's possible to access to the two screws which fix the little metallic cover (see next image).

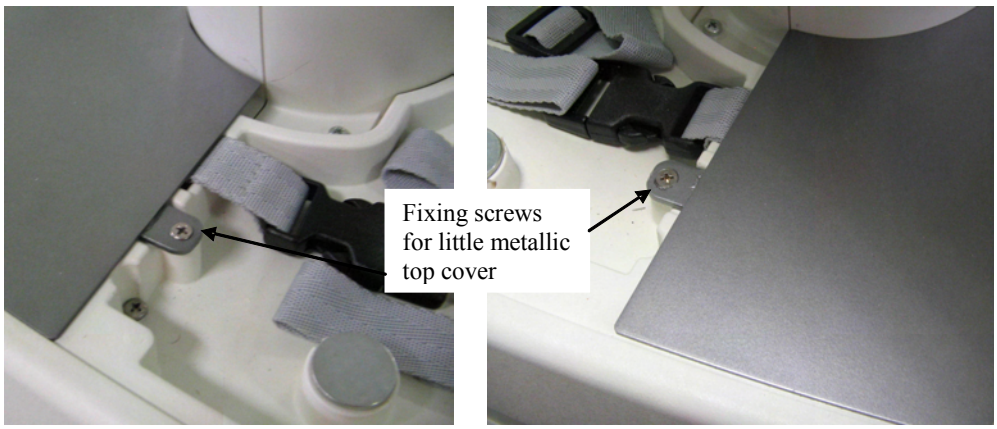


Figure 16.

Removing the little metallic cover, it's possible to access to the two upper screws which fix the frontal plastic panel (in the picture is indicated the MyLab Gold Platform unit, for the MyLab 70 the fixing screws are positioned in a different way)

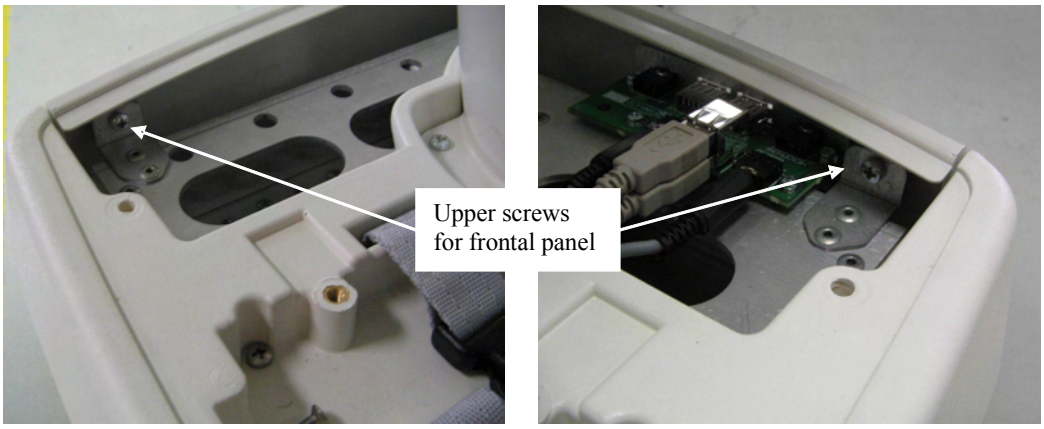


Figure 17.

Keyboard's plastic:
To remove it it's necessary to remove the complete keyboard group.

See in the next paragraphs how to do it.

Rear panel:
The rear panel is fixed with pins in the upper part and it's possible to raise it due to one little metallic fork fixed to the panel with two screws.

To remove the panel the procedure is the following:

-Unscrew the two screws that fix the fork to the panel

-push the top part of the panel, in order to remove the plastic pin of the panel from the metallic guide (form both the left and right sides)

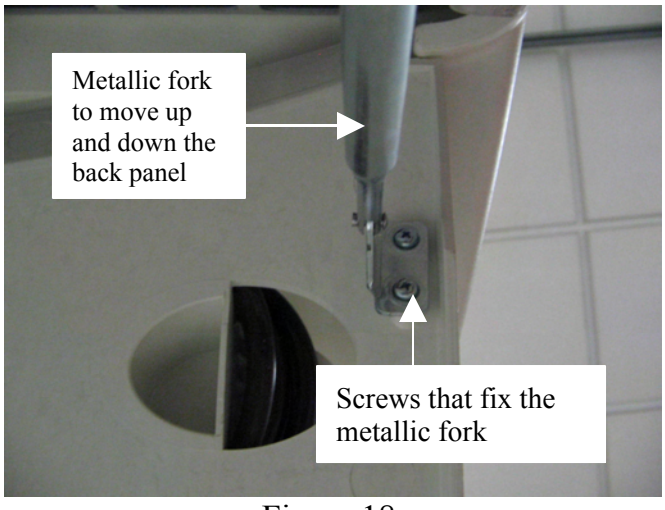


Figure 18.

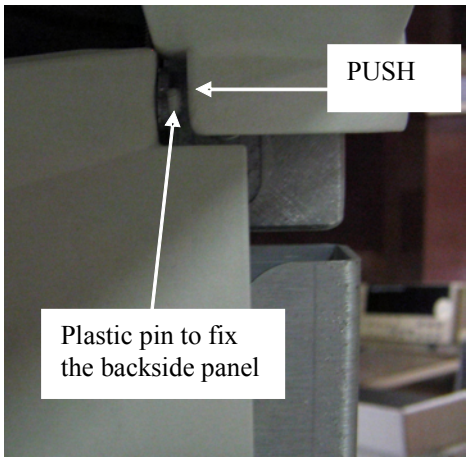


Figure 19.

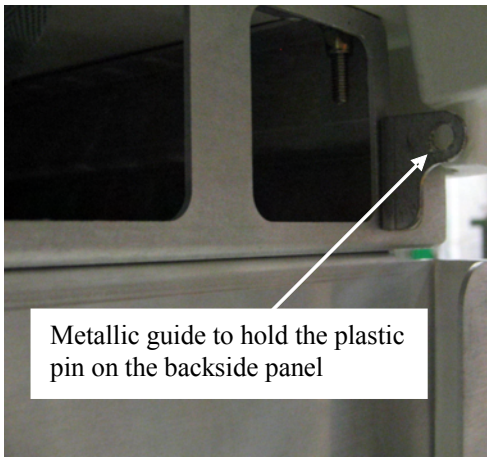


Figure 20.

Speakers' panel:

To remove it it's necessary to remove the complete display group.

See in the next paragraphs how to do it.

HOW TO OPEN THE UNIT

To open the unit, in order to approach the internal boards, it's necessary to remove the lateral plastics (left and right) and the lateral bumpers (left and right as well).

From one side there will be the access to the PC group, on the opposite side to the system's boards.

The access to the internal part of the unit is protected from two metallic panels, fixed to the chassis with four screws.

Removing the metallic panels it's possible to access to the system's boards and to the PC group.

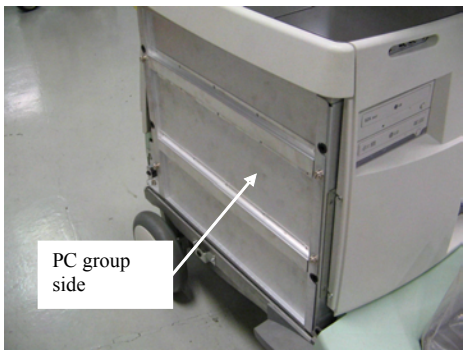


Figure 21.

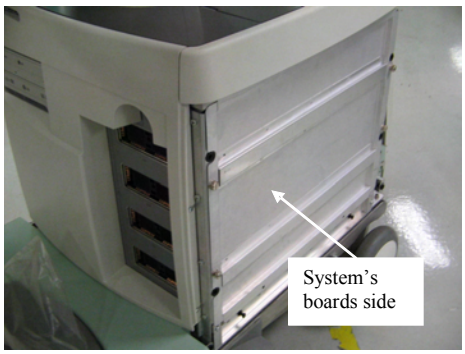


Figure 22.

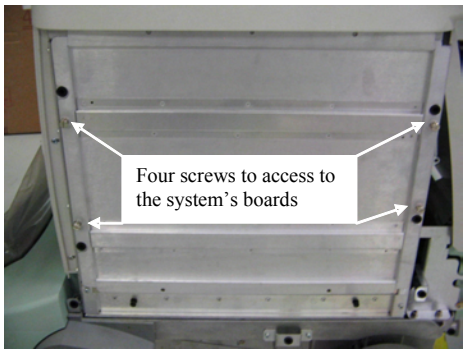


Figure 23.

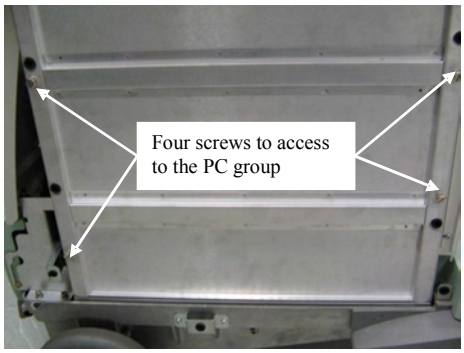


Figure 24.

HOW TO REMOVE THE BOARDS

The procedure to remove the boards it's almost the same for all.

There are some differences for the ICS, the SPS and for the PC group (with all the boards which compose it).

For all the other boards it's necessary to remove the plastic and the metallic lateral panels.

The boards are blocked inside the chassis with two metallic stops (one in the upper side and one in the lower).

It's sufficient to open them and to raise the two plastic levers and the board will be removed form its connector.

In the next picture are shown all the blocking systems.

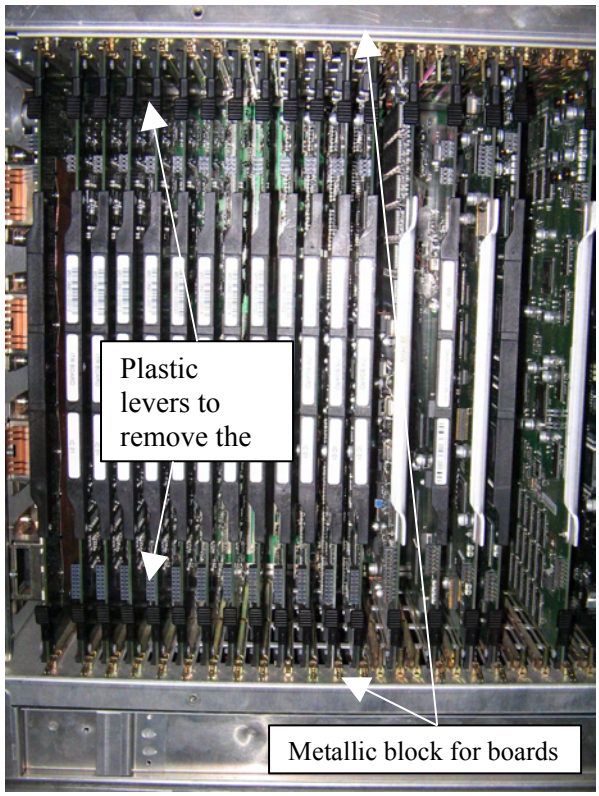


Figure 25.

In the next figure is indicated the position of every board of the unit on the main bus.

To insert the boards in the system, is necessary to fit them into the right slit; paying attention that the two lateral tracks placed in the inner part of the slit must match the board and that the two lateral blocks of the board are risen.

The board must slide slowly inside the unit until it is almost completely inserted. Fix it pushing the two lateral blocks of the board.

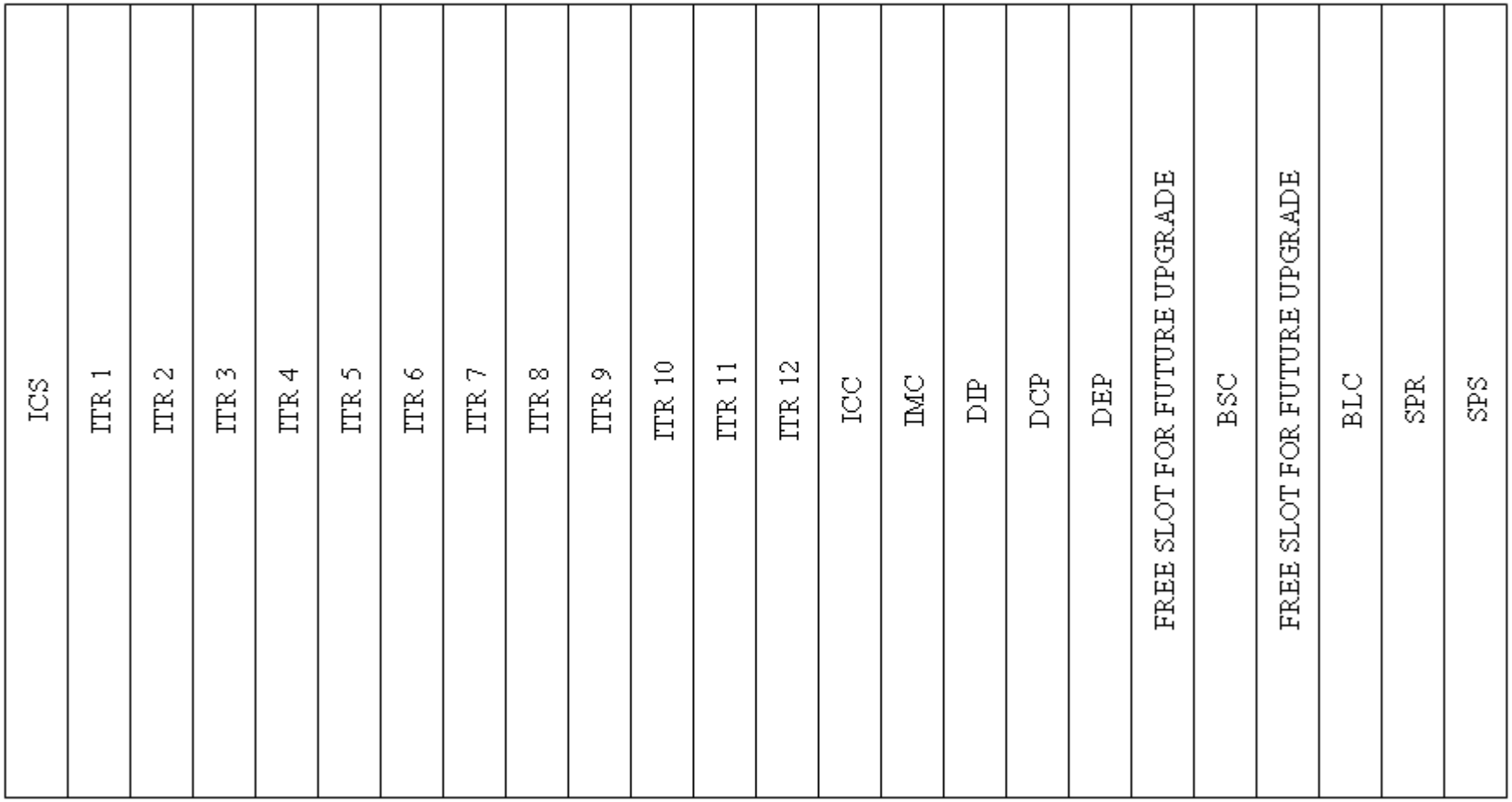


Figure 26.: **MyLab70 and MyLabGold Platform (DEP is optional for MyLab70 units)**

HOW TO REMOVE THE ICS

To remove the ICS the steps are the following:

-remove the fontal plastic panel and the lateral panels (plastic and metallic)

-remove the lateral support; this part is fixed with four screws (see next picture)

-remove the eight frontal screws which fix the ICS to the frontal frame

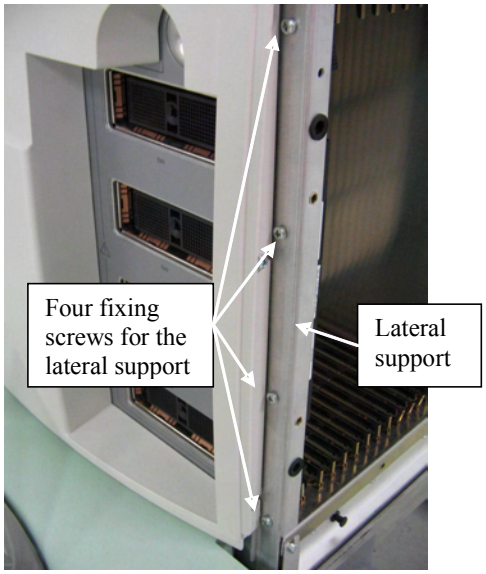


Figure 27.

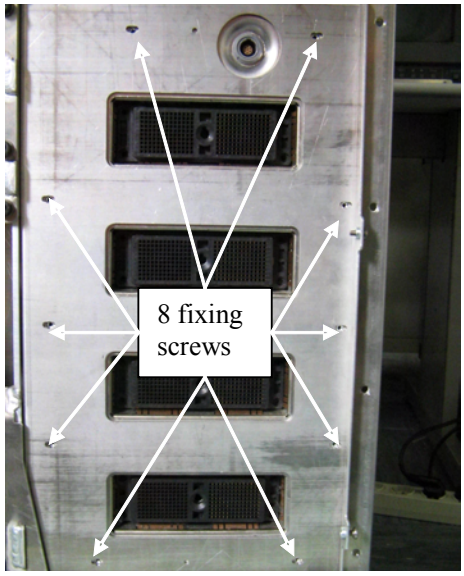


Figure 28.

-Now the ICS is blocked inside the chassis only with the two metallic stops (one in the upper side and one in the lower).

It's sufficient to open them and to raise the two plastic levers and the board will be removed from its connector.

HOW TO REMOVE THE SPS

The line voltage supplies the mentioned board, so it's not possible to operate on it with the system on.

All the operations have to be performed with unit off.

It's also necessary to wait few minutes, in order to permit to the internal capacitor to lose the charge and to avoid electrical shocks.

The part is protected with a metallic frame, in order to avoid shocks.

The procedure to remove it is the following:

-remove the metallic protection frame pulling it

-remove the rear cord, which supply the line voltage to the SPS board.

-remove the two screws on the rear part of the unit which fix the SPS to the metallic chassis

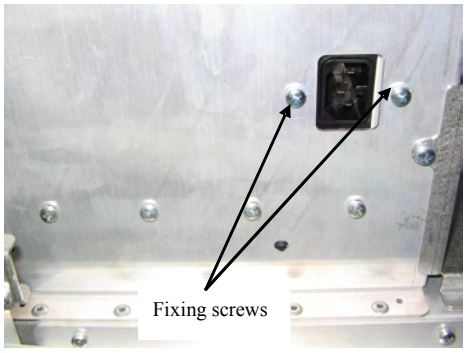


Figure 29.

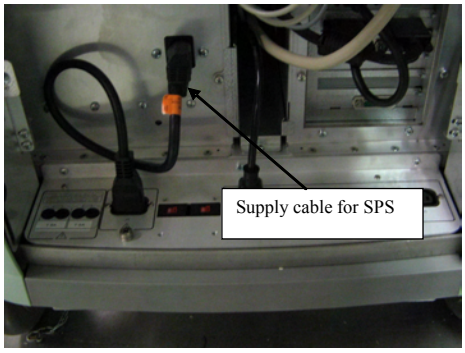


Figure 30.

Now the SPS is blocked inside the chassis only with the two metallic stops (one in the upper side and one in the lower).

It's sufficient to open them and to raise the two plastic levers and the board will be removed form its connector.

HOW TO REMOVE THE PC GROUP

The following board composes the PC group:

PC motherboard, AKCP, VCP, video board (external board not integrated on the PC motherboard), PVA, Frame grabber, PLC and PSE (with ECG inside).

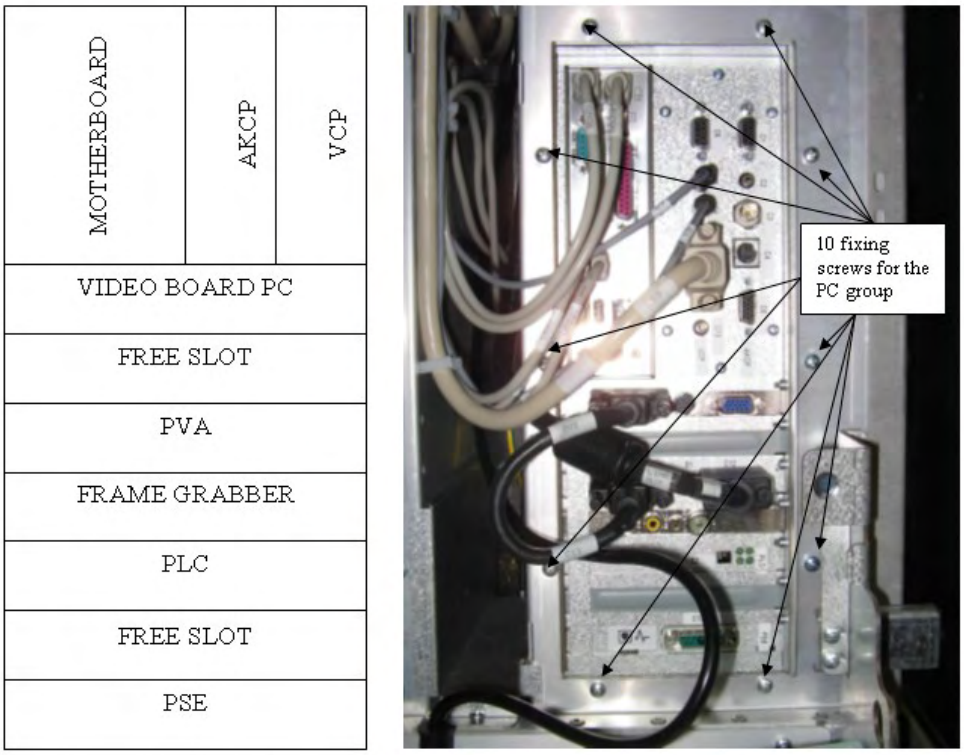


Figure 31.: Backside view of the PC group

To remove the PC group the procedure is the following:

-remove the lateral plastic panel and bumper and the metallic panel which covers the PC group

-raise the rear panel to access to the cables connected to the group

-disconnect all the rear cables of the PC group: mouse, alphanumeric keyboard, 3 USB connectors and the audio IN from microphone on the PC motherboard, the supply for the keyboard and display group and the audio out for headphones (connector C7) on the AKCP board and the video cable for the monitor (connector C12 on the PVA) and other cables eventually connected (peripherals, ECG…)

-unscrew the ten screws on the backside panel which connect the PC group to the metallic chassis (see Figure 31)

-disconnect the internal flat cables that connect the PC group to the main bus of the unit (two on PSE, one to the PLC and another on the PVA) and the audio cable, as shown in the next pictures

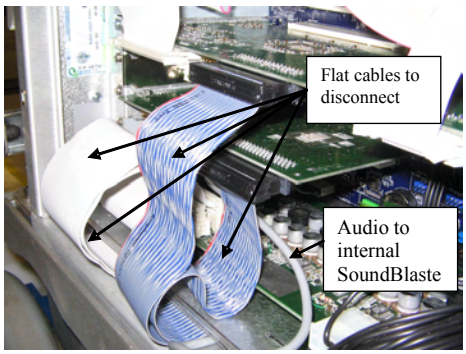


Figure 32.

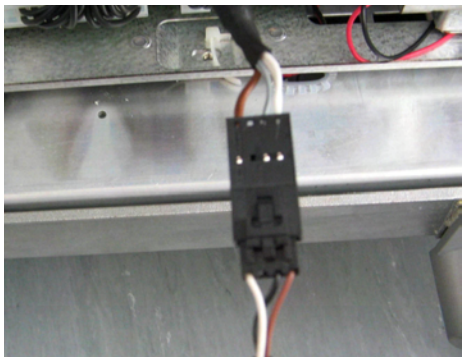


Figure 33 (audio connection).

-disconnect the two cables which supply the upper fan (connected to the AKCP) and the lower group of fan (connected to the PSE).

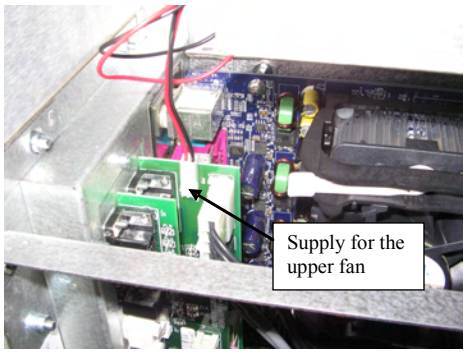


Figure 34.

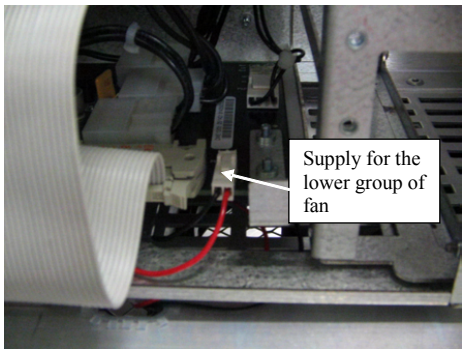


Figure 35.

-remove the IDE and the supply cables from the 5" ¼ peripherals

-unscrew the two internal screws which fix the metallic chassis of the PC group to the unit (see next pictures)

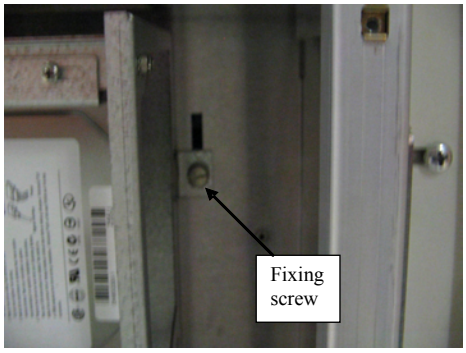


Figure 36.

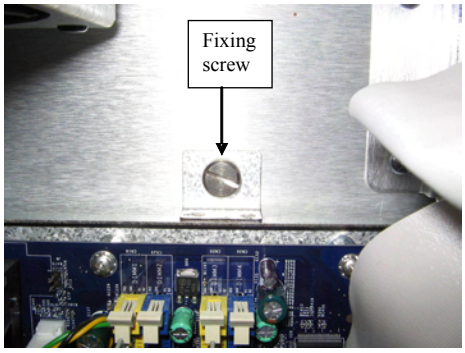


Figure 37.

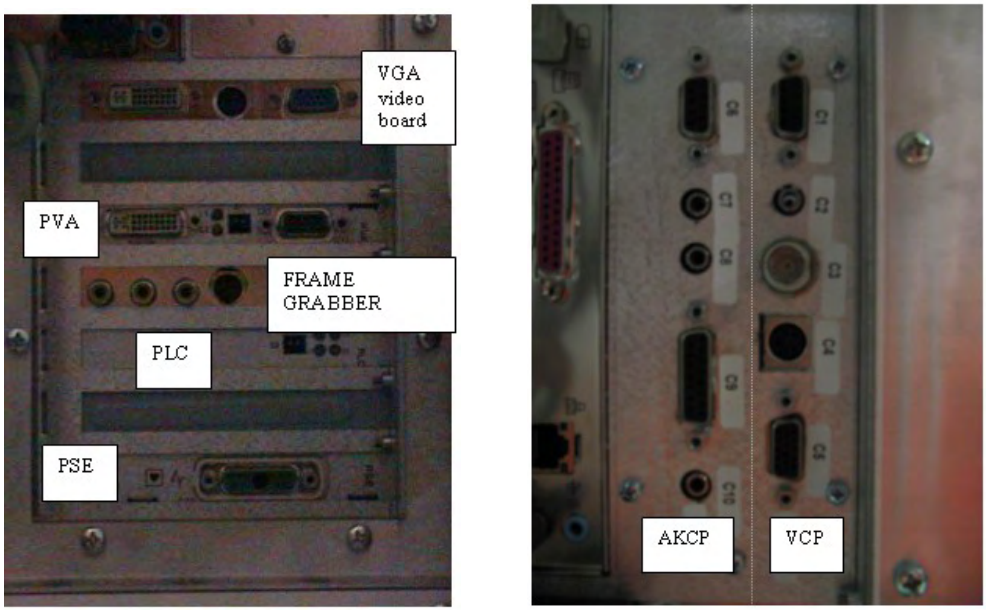


Figure 38.: backside view of the PC group without cables

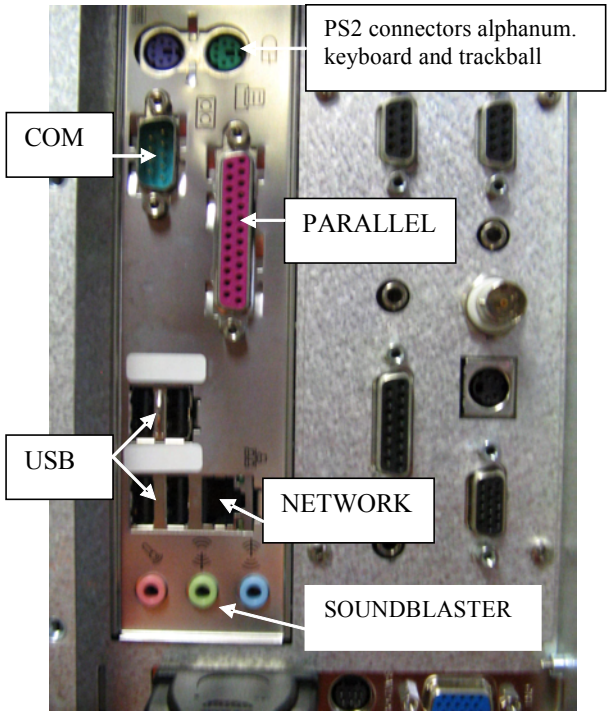


Figure 39.: backside view of the PC group without cables

HOW TO REMOVE THE ECG BOARD

The ECG is integrated on the PSE board (inside the PC group), so it's necessary to remove the PSE.
The steps are the following:

-remove the lateral plastic panel and bumper and the metallic panel which covers the PC group
-raise the rear panel to access to the cables connected to the group
-remove the ECG cable from the connector
-remove the metallic block for the boards from the metallic chassis (see next picture)
-disconnect all the cables connected to the PSE board (2 flat cables, one cable which supplies the lower group of fan, one flat between the PSE and PVA, all the supply cables for the part of the PC group), the flat connected to the PVA and PLC and the audio cable to the PC motherboard (se previous point)

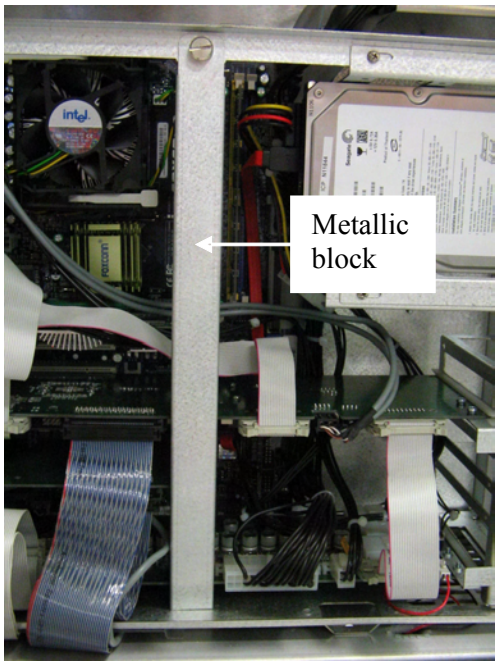


Figure 40.

-unscrew the two screws which fix the board to the PC chassis and remove it.

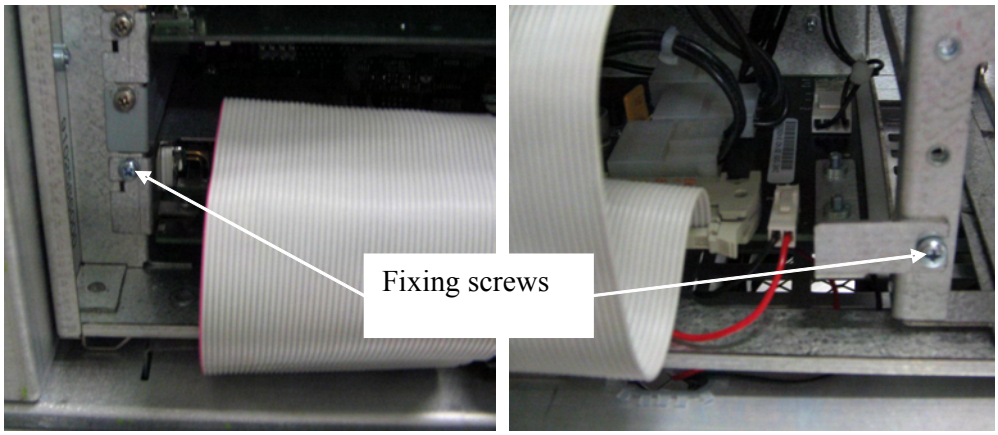


Figure 41.fixing screws for PSE board

HARD DISK

The Hard Disk drive is positioned inside the PC group.
The necessary steps to remove it are the following:

-remove the lateral left panels (plastic and metallic)
-disconnect the cables connected to the device (supply and serial-ata cables)
-unscrew the four screws which fix the support of the HDD to the PC group and remove it
-unscrew the HDD from its metallic support

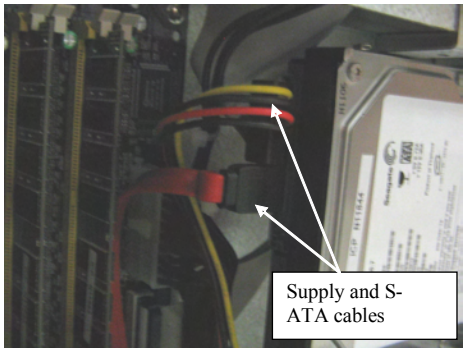


Figure 42.

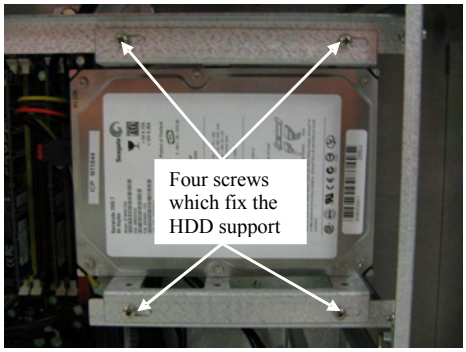


Figure 43.

REMOVE 5" ¼ PERIPHERALS

The 5" 1/4 peripherals are accessible from the PC group.
The necessary steps to remove them are the following:

-remove the lateral left panels (plastic and metallic)
-disconnect the cables connected to the device (supply and IDE cables)
-unscrew the four screws which fix the support of the HDD to the PC group and remove it

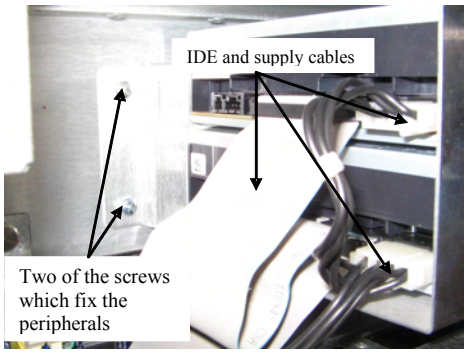


Figure 44.

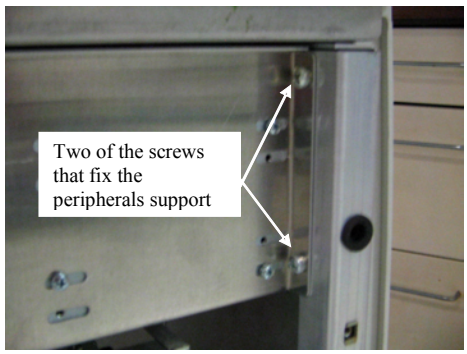


Figure 45.

-unscrew the peripherals from its metallic support

KEYBOARD GROUP

To replace the keyboard group it's necessary to remove nr. 9 screws positioned below the keyboard.
Figure 46, Figure 47, Figure 48 and Figure 49 show the mentioned screws.

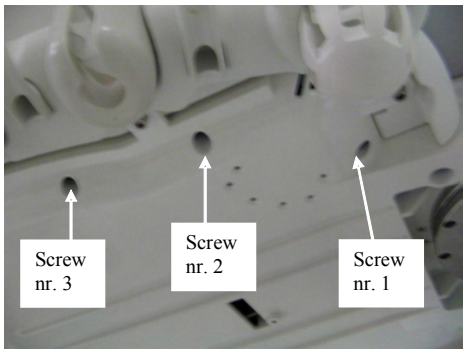


Figure 46. lower right side

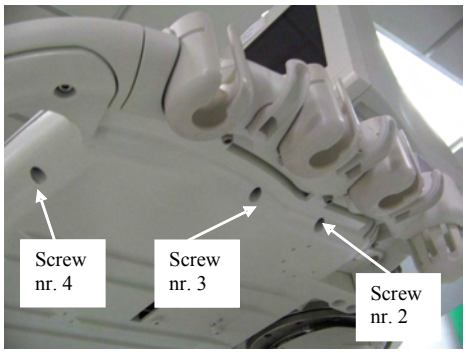


Figure 47. lower right side

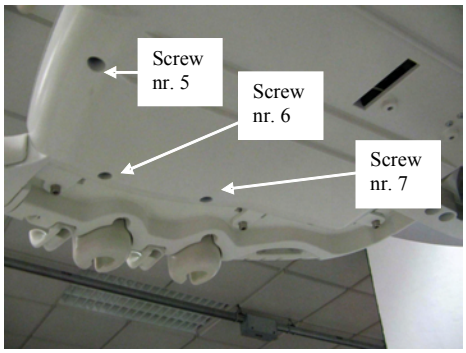


Figure 48. lower left side

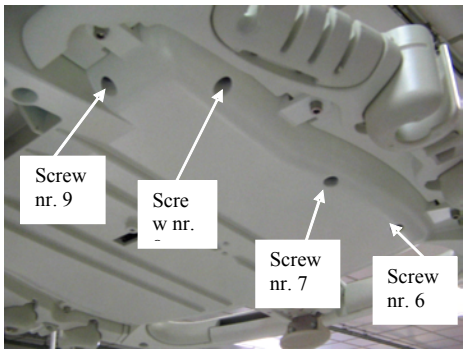


Figure 49. lower left side

Rising the part it's necessary to proceed carefully, because two flat cables connect the keyboard group to the display group.
Figure 50 and Figure 51 show the flat cables and the connectors on the keyboard group.

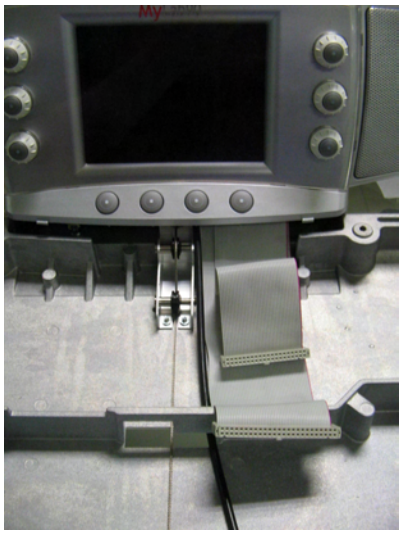


Figure 50. the flat cables

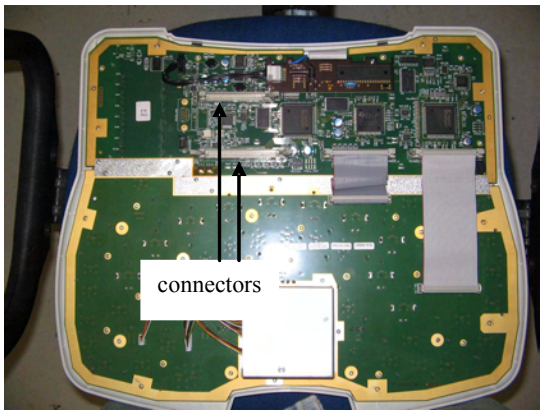


Figure 51. the two connectors

TRACKBALL

To access the trackball zone it's necessary to remove first the keyboard group (see previous point).
After unscrew the four screws indicated in the next pictures and disconnect the two cables connected to the side of the trackball.

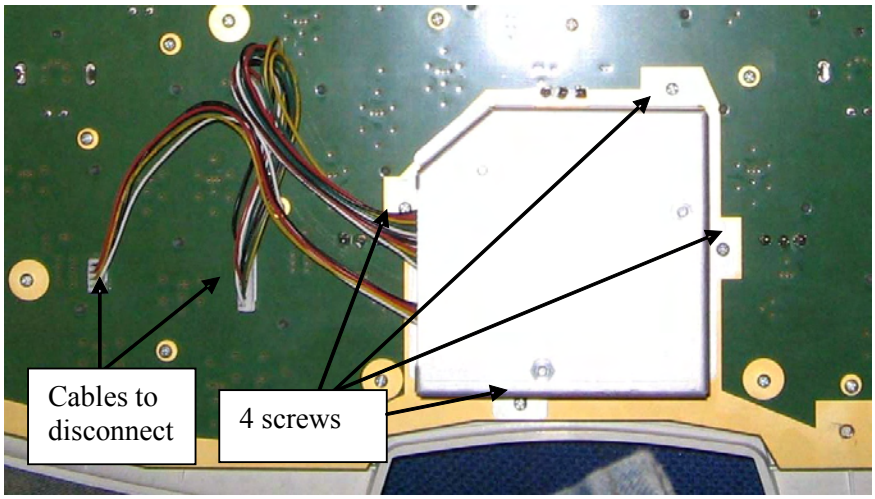


Figure 52.

DISPLAY GROUP

To remove the display group it's necessary to proceed in the following way:

-remove the monitor in order to access to the plastic panel that covers the speaker and the backside of the display group
-remove the plastic panel unscrewing the five screws which fix it to the unit (see next pictures)

Figure 53.

Figure 54.

-remove all the cables connected to the display group: nr.2 PS2 cables for keyboard and mouse, the supply cable for the keyboard group, the USB cable for all the commands, the two flat cables which connect the keyboard group to the display group and the speaker's cables in the two upper sides

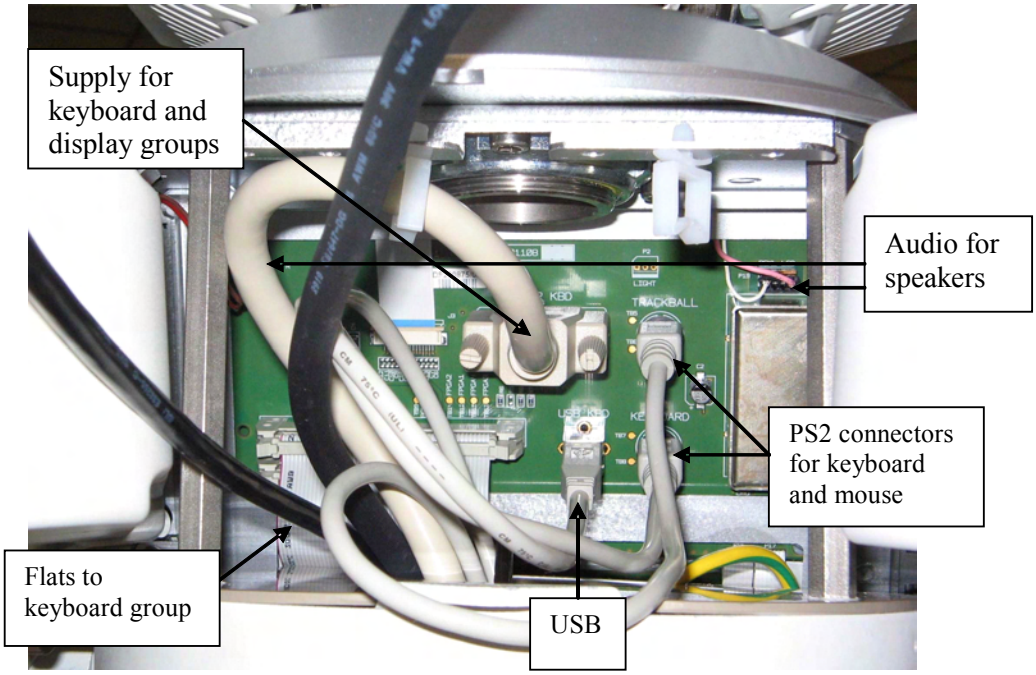


Figure 55.

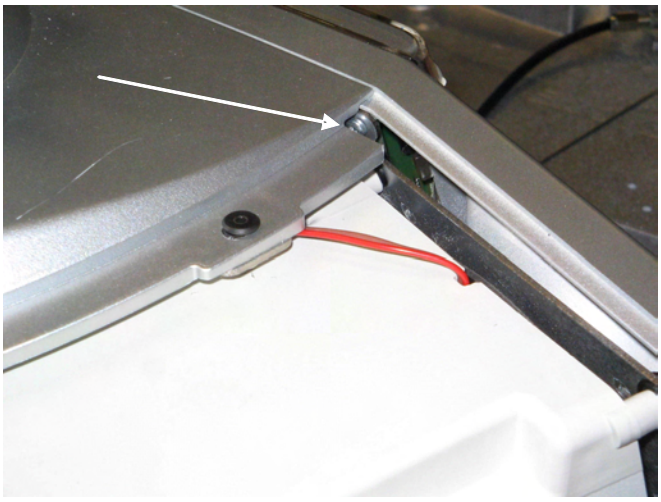


Figure 56.

-remove the six screws which fix the display group to the metallic chassis. Removing the mentioned screws the display is free, so it's necessary to keep attention do not fall down the part.

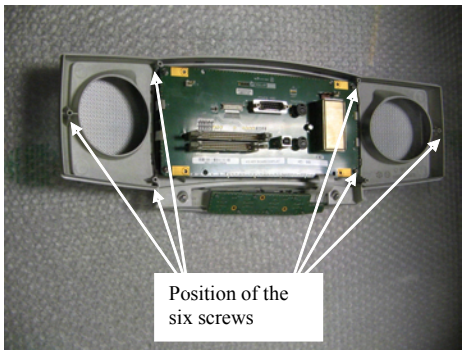


Figure 57.

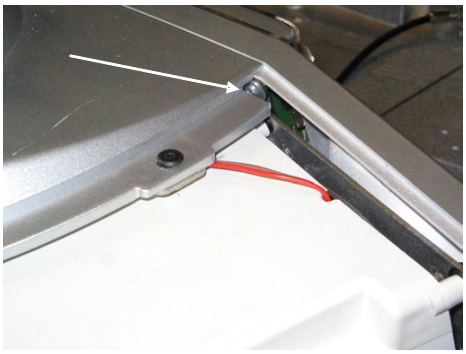


Figure 58.

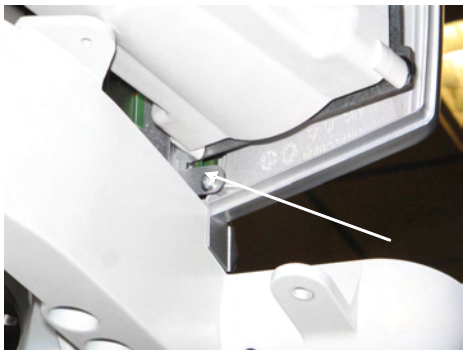


Figure 59.

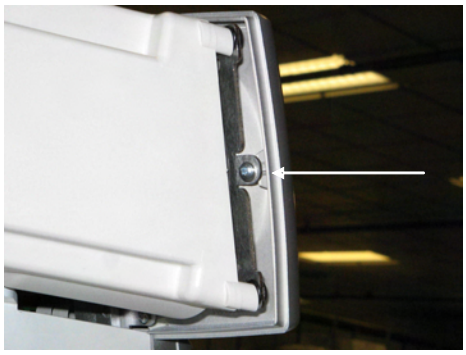


Figure 60.

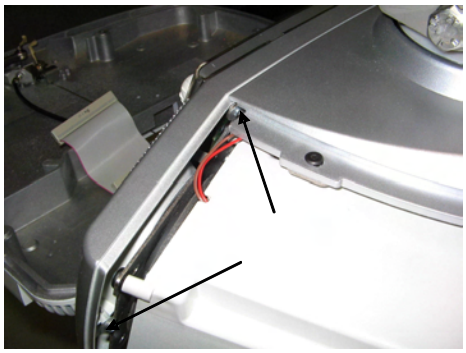


Figure 61.

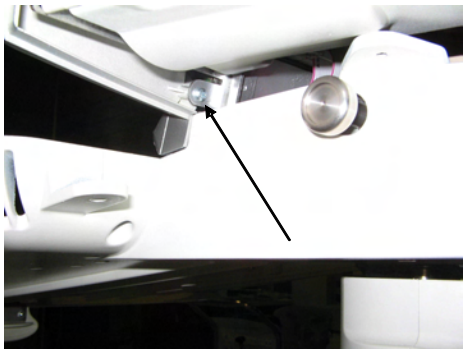


Figure 62.

SPEAKERS

To remove the speakers it's necessary to remove first the display group.
In this way it's possible to access to the two speakers.
Every speaker is fixed to the metallic chassis by four screws.
The audio cable is connected to the display group (as shown before).
Unscrewing its four screws it's possible to remove every speaker.

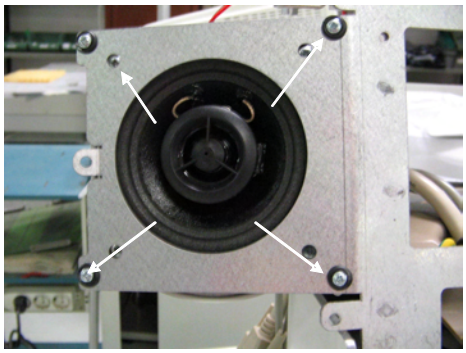


Figure 63.

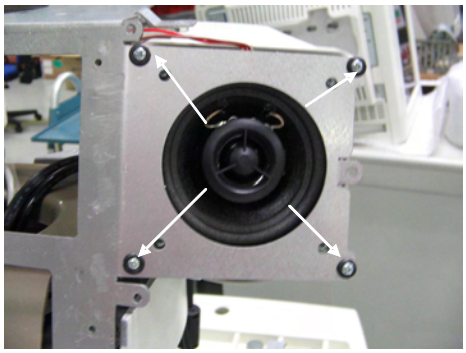


Figure 64.

MONITOR

To insert the monitor proceed in the following way:

-place the monitor to the metallic basement shown in the next figure. Keep attention that the holes in the monitor's basement match the pins on the metallic basement

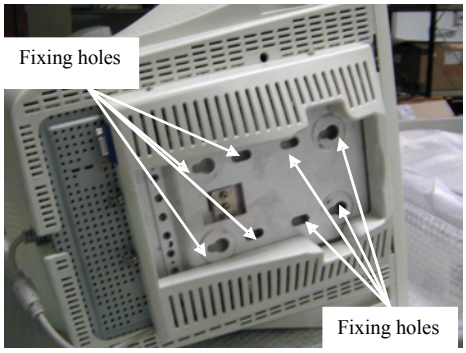


Figure 65.

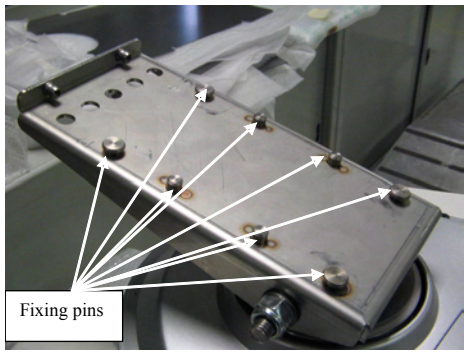


Figure 66.

-Slide the monitor from the backside to the frontal side keeping attention that it's correctly positioned and the matching pins entered in the holes

-Fix the monitor to the metallic basement of the unit with the two backside screws turning them 90 degrees

-Connect the power supply and the video cables

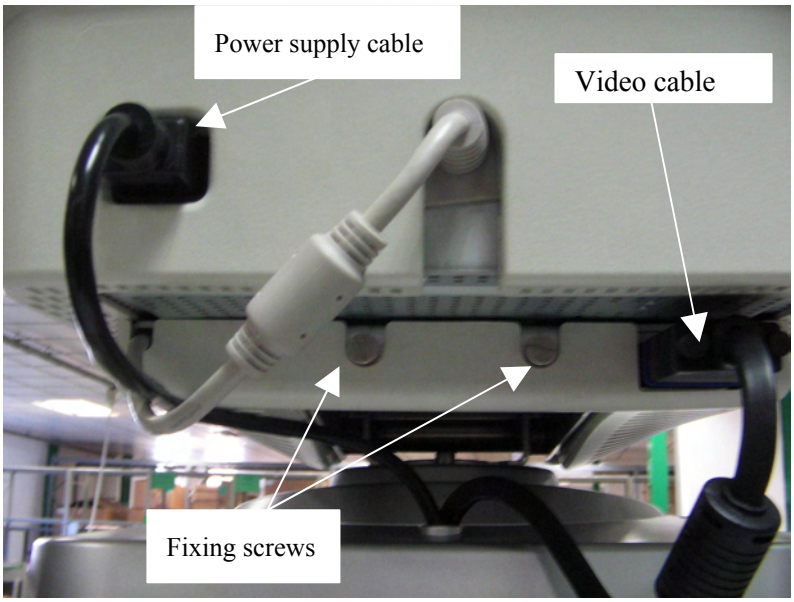


Figure 67.

To remove the monitor proceed vice versa:

-Disconnect the power supply and the video cables
-Unscrew the fixing screws (shown in Figure 67) and slide the monitor to the backside.
-Raise the monitor and remove it keeping attention

WHEELS

To remove the wheels it's necessary to rise the system and to leave it in a safe position.
The wheel has to be free.
The fprocedure is different from the frontal or the rear wheels:

Frontal wheels

Uscrew the four allen screws which fix the wheel to the metallic chassis (see figure)

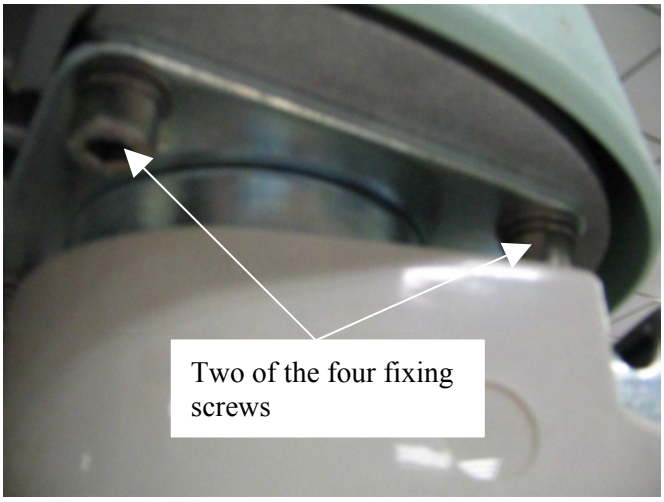


Figure 68.

Rear weels

-Remove the plastic cover that it's pushed (on the plastic cover there are 3 pins that match some holes on the wheel
-remove the fixing washer which fix the wheel and remove it

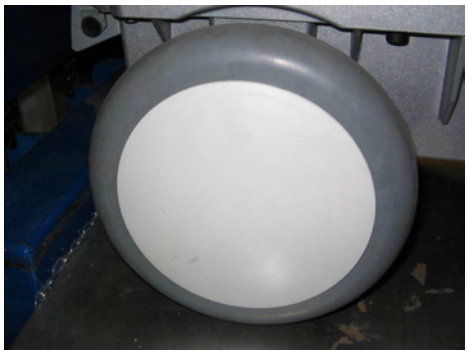


Figure 69.

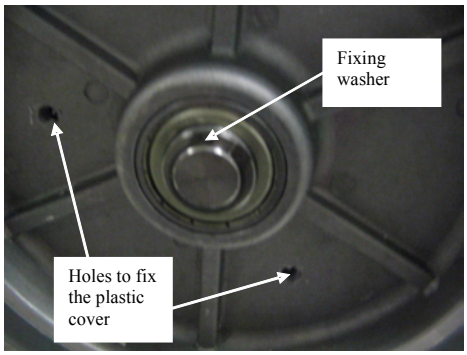


Figure 70.

SYSTEM'S FAN

In the system are present the following fan:
One upper fan for the PC group and one group of fan, positioned in the lower part of the unit, under the board for all the system's boards.

Upper fan

-open the unit to access to the PC group, then to disconnect the cable which supply the upper fan (connected to the AKCP)
After unscrew the four screws which fix the metallic holder to the chassis of the unit

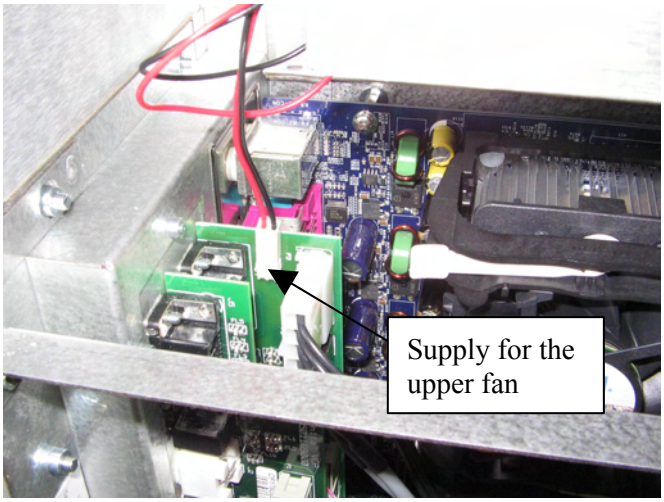


Figure 71.

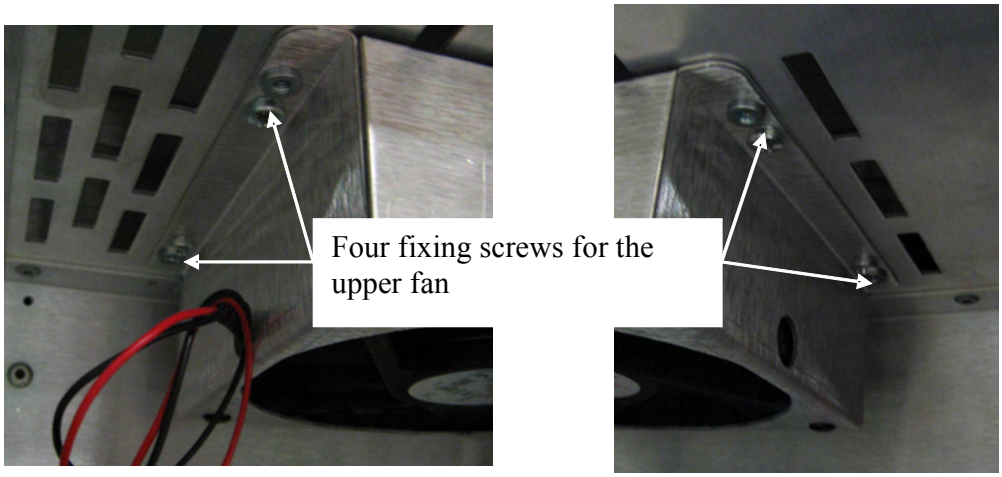


Figure 72.: fixing screws

Lower fan group

-remove the right plastic panel and the lateral bumper to access to the system's board, then unscrew the two screws which fix the metallic panee that holds the lower group of fan
slide the panel (there is a guide iside the system) to remove the group, keeping attention to the supply cable.
Disconnect it and remove the group.

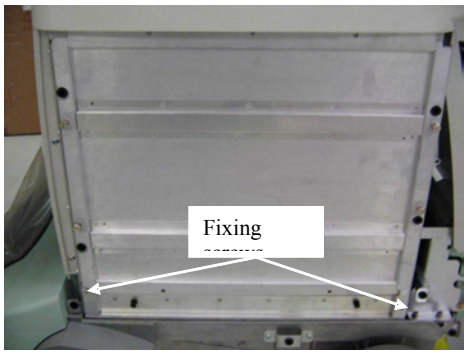


Figure 73.

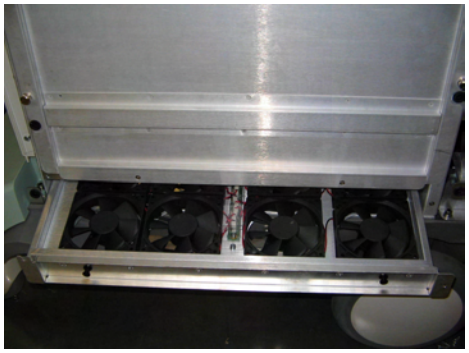


Figure 74.

Chapter 4

Block Diagrams

This chapter will explain the block diagrams of the **MyLab 70 and MyLab Gold Platform** boards, in order to permit to understand all the functions that each one performs.

System Block Diagrams

In the next paragraphs, will be described the block diagram of the whole **MyLabGold Platform** unit, to explain easily all the interactions that are present among the various boards.

In the block diagrams, the functions are gathered to permit an easy comprehension of the block functioning, which indicates the correlative electronic boards.

MyLab Gold Platform Block Diagram

In Figure 1. there is the block diagram of the unit.

At the start-up the PC and the boards starts in parallel: the PC will start the Win XP sw and the unit will start the test and program of the various boards.

As soon as the unit starts, the BLC and the IMC start to check the boards present, the HW version and if there are errors.

The BLC make this operation on the back end (DIP, DCP, BSC, DEP) and on the IMC.

After this operation from the BLC, the IMC will program the ITRs, the ICC and the ICS.

When all the operations are completed the probe selection menu will appear on the screen and the unit will start to work..

The ICS is the board where are connected all the probes; on board there are four zif connectors and one round connector for pencils. The ICS receives the transmission data (bangs) for the probes from the ITR and control signals and settings from the IMC.

In the ICS doesn't arrive the high voltage to generate the bangs, this operation is performed on the ITR in parallel, so the ITRs send to the ICS already the high voltage signals.

The ICS doesn't perform any elaboration on the bangs or on the data received from the probes, but simply it sends the US data from the probes directly to the ITR.

The ICS sends the information about the probe connected to the IMC.

The ITR are twelve boards working each one in a little portion of the image (little vertical areas not consecutive).

They generate the bangs (they receive the high voltage from the power supply) according the settings and the probes connected.

The US data from the ICS are managed in the same way (every board manages little vertical areas not consecutive).

On the ITR the data are filtered, transformed from analog to digital and the focalization is performed. The data are also amplified according the gain selected by the user.

The IMC controls all the operations performed on the ITR and on the ICS.

It sends to the mentioned boards all the necessary data (focalization data, gain, timing to acquire images and to generate the bangs).

It receives the information about the probe connected and sends it to the PC (in order to show it on the screen).

The US data from the ITR arrives to the DIP. This one performs other filtering and different elaborations for the US modalities BW, CFM and PW Doppler.

From the board exits the BW data directed to the BSC and the I and Q components (in phase and quadrature for the CFM and PW) directed to the DCP

In case of particular post processing elaborations of the image, from the DIP the BW data arrives to the DCP and, from this board (without any other elaboration), arrive to the DEP.

The DEP performs only post processing elaborations for the BW signal, according some particular formula.

The data elaborated are sent to the BSC. When the DEP works, the direct communication DIP-BSC is not active, vice-versa when the post-processing is not working, the DEP is not involved in the management of the BW image.

The CW Doppler for the electronic probes is managed by the ITRs, which generate the bangs and send them to the ICS.

The CW signal received from the probe returns to the ITRs and then to the ICC (clock and CW generator), where it's processed (filtering, gain….) and where are generated the two components I and Q (in phase and quadrature). The I and Q data (analog signal) are sent to the DCP.

For the Pencils, the bang is directly generated by the ICC which sends the signal to the ICS.

The data from the Pencil probe returns to the ICC, where it's processed in the same way of the electronic probes.

The IMC controls all the processing also for the CW and send all the right settings to the ICC (gain, filters…).

The ICC generates also all the clocks necessary to the unit.

The BSC is the scan converter and the CINE memory.

It receives the BW data from the DIP or from the DEP and stores them in internal memories, ready to be sent for the next steps.

Also it receives the ECG signal (from the PSE) and mixes it to the BW image. It controls also the ECG acquisition.

The DCP receives the I and Q signals and generates the CFM image or the Doppler trace according the mode selected and the setup of the user.

After the elaboration the data are sent to the BSC for the scan converter

For the CW Doppler, the signal before is converted from analog to digital, then processed as for the PW.

The audio trace for the Doppler is directly sent to the PVA board (inside the PC group) where it will be managed.

The BSC receives also the CFM and Doppler data (both PW and CW) and mixes them to the BW image (B and M) from the DIP and with the ECG trace (in case it's present).

Also for the CFM and Doppler the cine memory is inside the BSC.

The US video image, which is produced by the BSC, is sent to the BLC

In this board the US data receives post-processing elaborations (palette BW, CFM…) and then are sent to the PVA (board inside the PC group).

The PVA will mixes the overlay (from the VGA board of the PC) with the US data from the BLC and send the result to the monitor.

It also receives the audio signal from the SoundBlaster, in the board is amplified and then is sent to the speakers.

The PC motherboard receives the command from the keyboard group, it transfers them to the PLC which sends all the commands to the BLC and from this unit to the rest of the system.

The Figure 2. is the block diagram of the PC group.

The mentioned parts compose the power supply group:

the main power switch group, where there is the main switch of the unit, the insulation transformer and the unit fuses.

On this group there are the auxiliary plugs for the external peripherals and the monitor.

From this group the AC voltage (220V or 115) arrives to the SPS board where the AC line voltage is transformed in a 15 Vdc.

From this voltage (inside the SPR and PSE) will be generated all the other voltages of the unit.

The SPS also generates the supply voltage for the fans (variable from 7 to 15 Vdc according the temperature).

This 15 Vdc is sent to the SPR and PSE.

The SPR is the board responsible to generate all the voltages necessary for the unit: +5Vdc, +3.3Vdc, $\pm$ 6Vdc, $\pm$ 12Vdc, the high voltage for the bangs…..

They are sent to the various boards.

The PSE (which is positioned inside the PC group) receives the 15Vdc and generates the necessary voltages for the PC, the HDD, the keyboard group and the Display group.

Also on this board there is the ECG part of the unit.

On the PSE there is the ECG plug to connect the ECG cable to the patient, the data from the PSE arrives directly to the BSC.

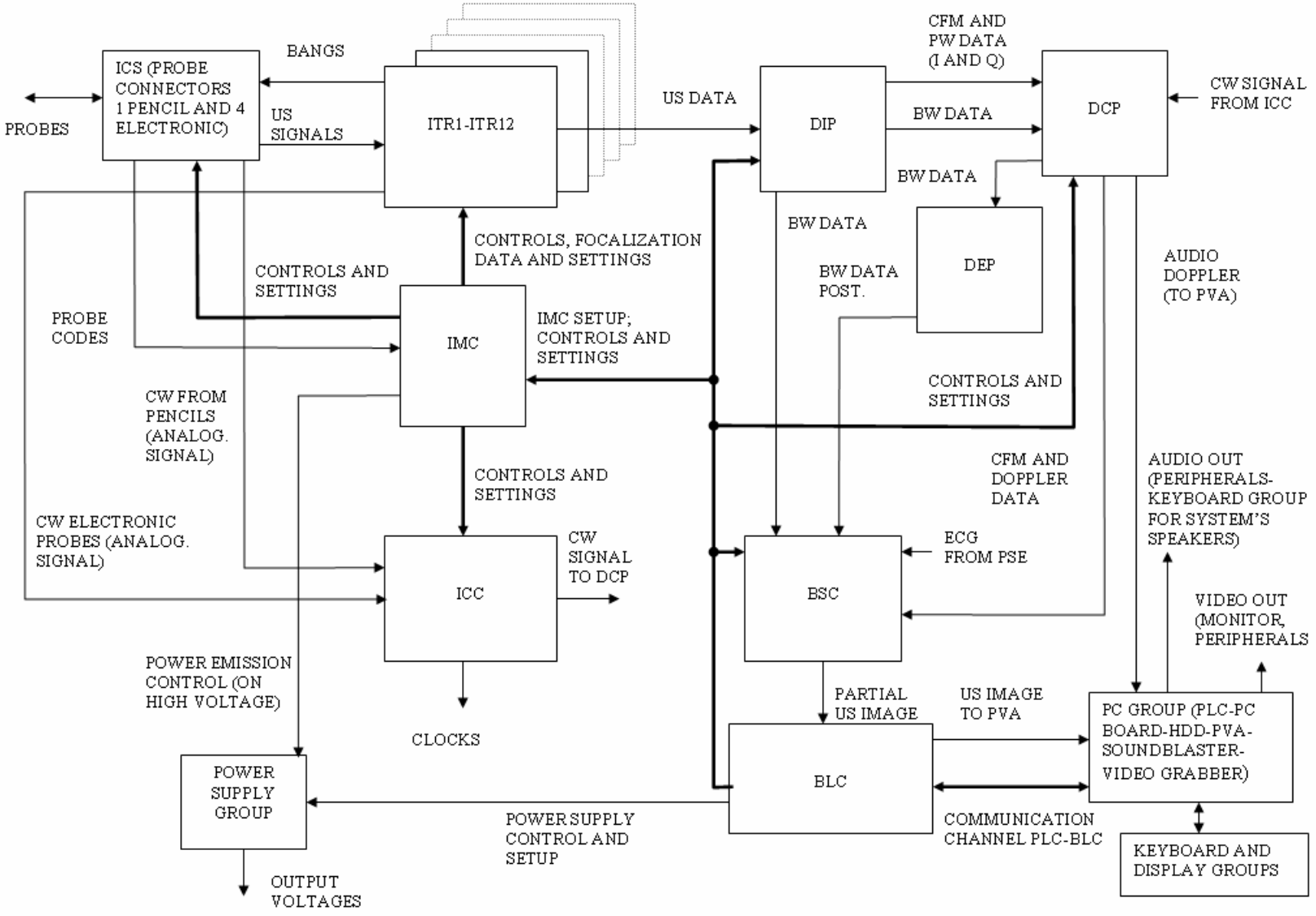
The BLC and the IMC control the output voltages of the power supply group.

The Figure 3. is the block diagram of the power supply group.

The keyboard group is the interface between the user and the unit.

All the communications from/to the keyboard group are through the display group, which works as interface between the keyboard and the PC motherboard.

The display group has a display on board, where are visualized some parameters (different according every modality) selected and modified by some switches and encoders on board.


PROBES
ICS (PROBE CONNECTORS 1 PENCIL AND 4 ELECTRONIC)
BANGS
US SIGNALS
ITR1-ITR12
US DATA
DIP
CFM AND PW DATA (I AND Q)
BW DATA
DCP
CW SIGNAL FROM ICC
BW DATA
BW DATA
DEP
BW DATA POST.
AUDIO DOPPLER (TO PVA)
CONTROLS, FOCALIZATION DATA AND SETTINGS
CONTROLS AND SETTINGS
PROBE CODES
IMC
IMC SETUP; CONTROLS AND SETTINGS
CONTROLS AND SETTINGS
CW FROM PENCILS (ANALOG. SIGNAL)
CONTROLS AND SETTINGS
CFM AND DOPPLER DATA
AUDIO OUT (PERIPHERALS-KEYBOARD GROUP FOR SYSTEM'S SPEAKERS)
CW ELECTRONIC PROBES (ANALOG. SIGNAL)
ICC
CW SIGNAL TO DCP
BSC
ECG FROM PSE
VIDEO OUT (MONITOR, PERIPHERALS
POWER EMISSION CONTROL (ON HIGH VOLTAGE)
CLOCKS
PARTIAL US IMAGE
US IMAGE TO PVA
PC GROUP (PLC-PC BOARD-HDD-PVA-SOUNDBLASTER-VIDEO GRABBER)
BLC
POWER SUPPLY GROUP
POWER SUPPLY CONTROL AND SETUP
COMMUNICATION CHANNEL PLC-BLC
KEYBOARD AND DISPLAY GROUPS
OUTPUT VOLTAGES

Figu

re 1.

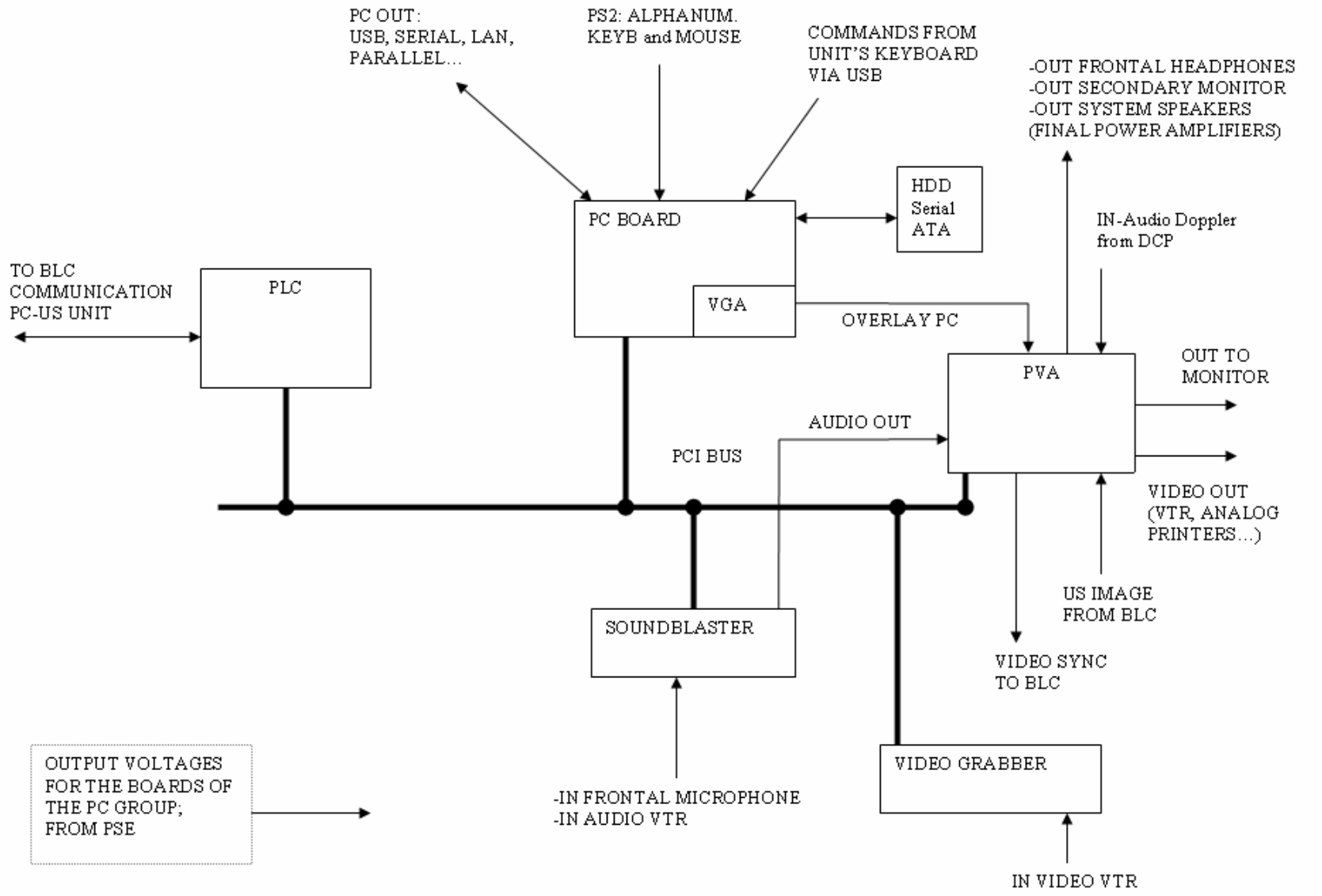

PC OUT:
USB, SERIAL, LAN,
PARALLEL...
PS2: ALPHANUM.
KEYB and MOUSE
COMMANDS FROM
UNIT'S KEYBOARD
VIA USB
-OUT FRONTAL HEADPHONES
-OUT SECONDARY MONITOR
-OUT SYSTEM SPEAKERS
(FINAL POWER AMPLIFIERS)
HDD
Serial
ATA
PC BOARD
IN-Audio Doppler
from DCP
TO BLC
COMMUNICATION
PC-US UNIT
PLC
VGA
OVERLAY PC
PVA
OUT TO
MONITOR
AUDIO OUT
PCI BUS
VIDEO OUT
(VTR, ANALOG
PRINTERS...)
US IMAGE
FROM BLC
SOUNDBLASTER
VIDEO SYNC
TO BLC
OUTPUT VOLTAGES
FOR THE BOARDS OF
THE PC GROUP;
FROM PSE
-IN FRONTAL MICROPHONE
-IN AUDIO VTR
VIDEO GRABBER
IN VIDEO VTR

Figure 2.

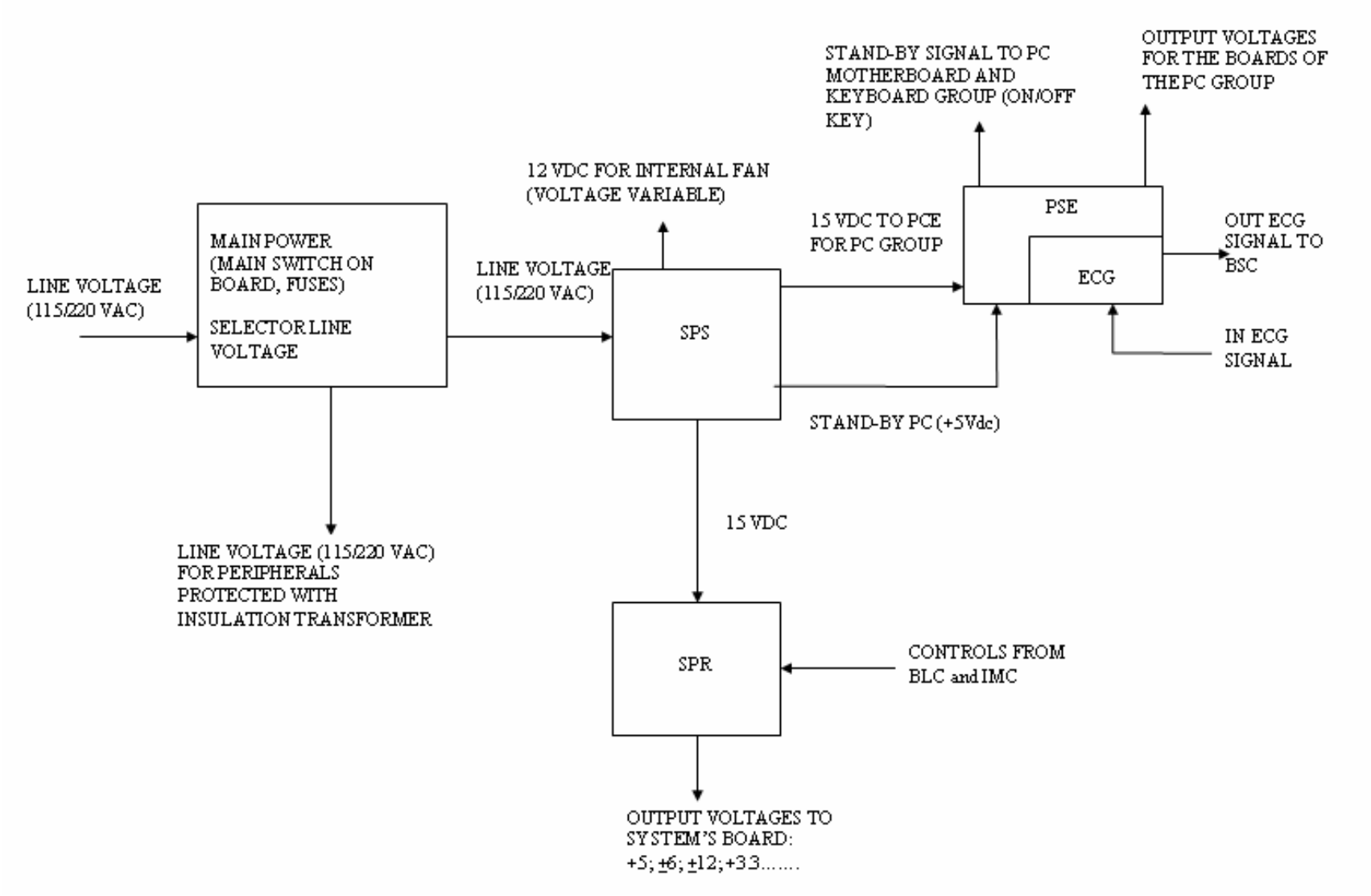

STAND-BY SIGNAL TO PC MOTHERBOARD AND KEYBOARD GROUP (ON/OFF KEY)
OUTPUT VOLTAGES FOR THE BOARDS OF THE PC GROUP
12 VDC FOR INTERNAL FAN (VOLTAGE VARIABLE)
PSE
15 VDC TO PCE FOR PC GROUP
OUT ECG SIGNAL TO BSC
ECG
MAIN POWER (MAIN SWITCH ON BOARD, FUSES)
SELECTOR LINE VOLTAGE
LINE VOLTAGE (115/220 VAC)
LINE VOLTAGE (115/220 VAC)
SPS
IN ECG SIGNAL
STAND-BY PC (+5Vdc)
15 VDC
LINE VOLTAGE (115/220 VAC) FOR PERIPHERALS PROTECTED WITH INSULATION TRANSFORMER
SPR
CONTROLS FROM BLC and IMC
OUTPUT VOLTAGES TO SYSTEM'S BOARD: +5; ±6; ±12; +3.3.....

Figure 3.

System Block Diagrams

In the next paragraphs, will be described the block diagram of the whole **MyLab 70** unit.

In the block diagrams, the functions are gathered to permit an easy comprehension of the block functioning, which indicates the correlative electronic boards.

MyLab70 Block Diagram

In Figure 4 there is the block diagram of the unit.

The way of working of te MyLab 70 is the same of the MyLab Gold Platform so the steps are the same.

The differences are:

-different ICS (with only 3 connectors for electronic probes)

-different type of ITR board (but they work in the same logical way)

-DEP board is optional. When the DEP is not present the US signal arrives directly to the BSC (sent from the DCP).

-different SPR (it sends out different voltages)

-the PC group code 9102572100 is optional (it makes a module with the DEP)

For the description of the MyLab 70 block diagram it's possible to follow the description of the MyLab Gold Platform unit.

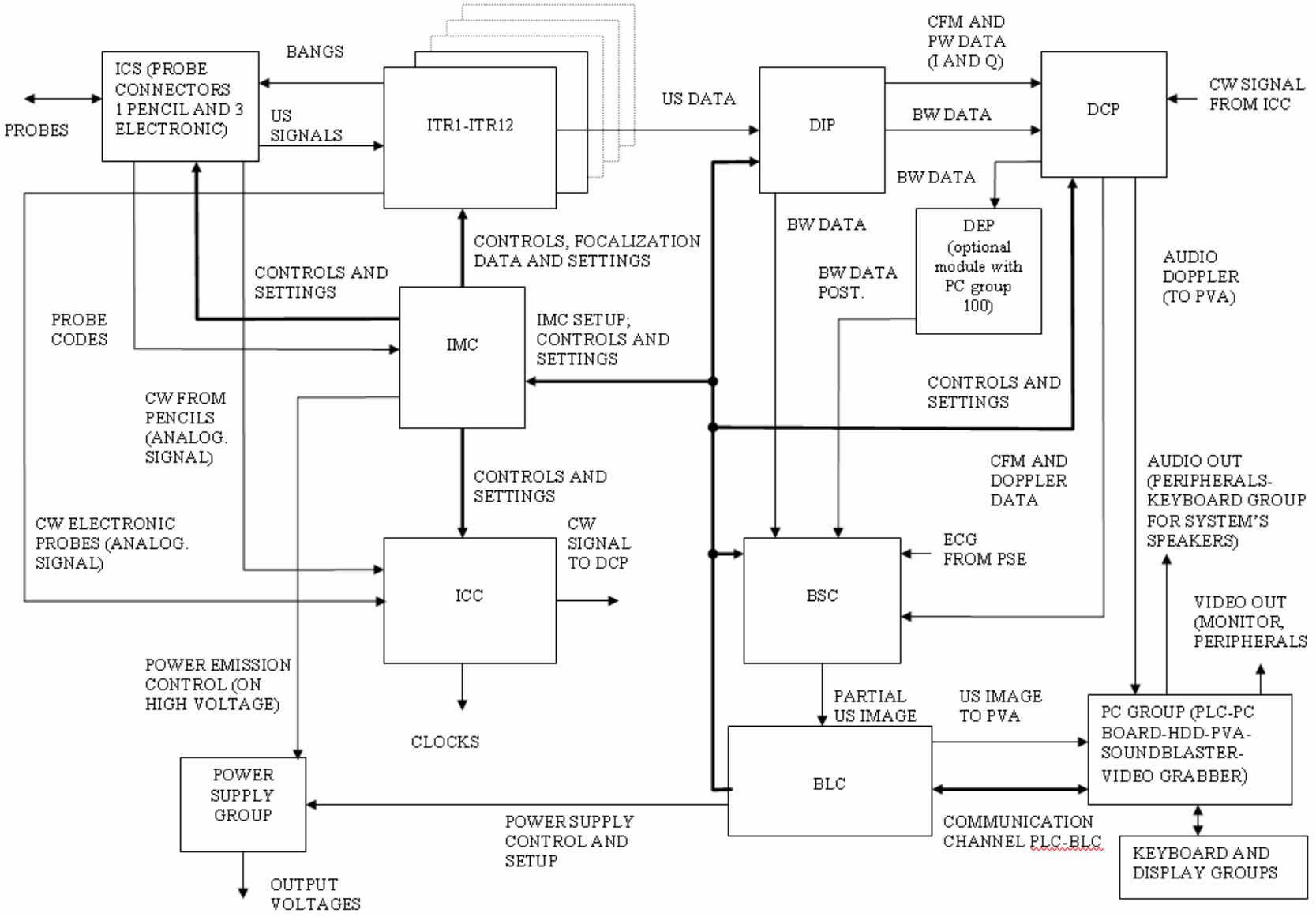

ICS (PROBE CONNECTORS 1 PENCIL AND 3 ELECTRONIC)
PROBES
BANGS
US SIGNALS
ITR1-ITR12
US DATA
DIP
CFM AND PW DATA (I AND Q)
BW DATA
DCP
CW SIGNAL FROM ICC
BW DATA
DEP (optional module with PC group 100)
BW DATA
BW DATA POST.
AUDIO DOPPLER (TO PVA)
CONTROLS, FOCALIZATION DATA AND SETTINGS
CONTROLS AND SETTINGS
PROBE CODES
IMC
IMC SETUP; CONTROLS AND SETTINGS
CONTROLS AND SETTINGS
CW FROM PENCILS (ANALOG. SIGNAL)
CONTROLS AND SETTINGS
CFM AND DOPPLER DATA
AUDIO OUT (PERIPHERALS-KEYBOARD GROUP FOR SYSTEM'S SPEAKERS)
CW ELECTRONIC PROBES (ANALOG. SIGNAL)
CW SIGNAL TO DCP
ICC
BSC
ECG FROM PSE
VIDEO OUT (MONITOR, PERIPHERALS
POWER EMISSION CONTROL (ON HIGH VOLTAGE)
CLOCKS
PARTIAL US IMAGE
US IMAGE TO PVA
PC GROUP (PLC-PC BOARD-HDD-PVA-SOUNDBLASTER-VIDEO GRABBER)
BLC
POWER SUPPLY GROUP
POWER SUPPLY CONTROL AND SETUP
COMMUNICATION CHANNEL PLC-BLC
KEYBOARD AND DISPLAY GROUPS
OUTPUT VOLTAGES

Figure 4.

BMB (9501103000)

The BMB board (Bus Mother Board) is the physical motherboard of the unit.
On it are present the connectors for the various boards.
No active components are present on the BMB.
The tracks where the data are exchanged among the various boards are directly wired in the bus.

ICS MyLab Gold Platform (9501087000)

The ICS (Input Connector Switch) is the interface among the probes and the rest of the unit.
On the ICS are assembled four connectors for electronic probes and 1 for pencil probes.
The board doesn't perform any elaboration on the US data from the probes and on the bangs, but simply passes/receives them/from to the ITRs.
In fact the bangs are already received at the high voltage level from the ITR and are directly sent to the right connector.
On board there are some relays which send to the connector selected the bangs from the ITR.
The information about the probe connected is sent to the IMC.

ICS MyLab 70 (9501087100)

The ICS for the MyLab 70 (Input Connector Switch) is the interface among the probes and the rest of the unit.
It works in the same way of the board for MyLab Gold Platform, but it has three connectors for electronic probes and one connector for pencils probes.
The board doesn't perform any elaboration on the US data from the probes and on the bangs., but simply passes/receives them/from to the ITRs.
In fact the bangs are already received at the high voltage level from the ITRs and are directly sent to the right connector.
On board there are some relays which send to the selected connector the bangs from the ITRs.
The information about the probe connected is sent to the IMC.

ITR MyLab Gold Platform (9501089000)

The ITR (Input Tx-Rx) is the responsible about the bang generation and about the focalization of the signals from the probes.
In the unit there are twelve ITR boards. No difference among them: every board can be seated in every ITR position without trouble.

From the IMC the ITRs receive all the focalization data and, according the probe and the preset selected, they generate the high voltage bangs, starting from the low signal bang (also generated inside the ITRs).
To perform this operation, the SPR sends in parallel to all the ITRs the high voltage to generate the bangs.
When ready they are sent to the ICS and then to the probe.
Every ITR manages little vertical portion of the image, not consecutive.
The data from the probes directly returns to the ITRs. They are filtered and amplified according the gain selected, then converted from analog to digital.
The digital data is stored in a memory ready to be sent out for the next elaboration.
The ITRs doesn't send the data directly to the DCP for the next elaboration, but every board sends out the data to the next ITR.
So the ITR1 will send out the US data to the ITR2; there the board will add the signal of the ITR1 to the signal of the ITR 2 and will send all to the ITR3 and so on.
Only the ITR 12 will send all the signals to the DIP for the next elaborations.

For the CW Doppler for the electronic probes, the boards will create the bangs and will send them to the ICS.
In the same way as before, every board will manage a little portion of channels in transmission and reception.
The data arriving from the probe are amplified and sent to the ICC for the next elaborations (still as analog signal).

ITR MyLab 70 (9501090000)

The ITR (Input Tx-Rx) is the responsible about the bang generation and about the focalization of the signals from the probes.

The ITRs for the MyLab 70 and Gold Platform works in the same way from the logical point of view, but the amplifier for the US wave are different between the two models.
For this reason it's not possible to mix the boards among them and to use the ITRs for Mylab 70 in the MyLab Gold Platform and viceversa.

The board description is the same as for the previous model.

ICC (9501091000)

The ICC (Input CW-Clock) is the responsible for the management of the CW Doppler and for the creation of all the clocks of the unit.

Starting from a single oscillator, the unit generates all the necessary clocks.
The signal from the oscillator enters in one FPGA controlled from a flash memory and this FPGA generates all the clocks.
From the FPGA they are sent out to the various boards.

For the CW Doppler, the boards works in two different ways for Pencils or for electronic probes.

In case of pencils the board generates the bang which is sent directly to the ICS.
The CW signal arriving from the pencil is filtered, amplified (also according the gain selected from the user) and then sent out to the DCP for the next elaborations.

In case of electronic probes, the board receives the signal from the ITR.
This signal enters in a delay chain in order to be focalized, then it's filtered and amplified (as before, also according the gain selected from the user).
After these steps, the signal is sent out to the DCP as for the pencils.

DIP (9501093000)

The DIP (Digital Imaging Processor) is the responsible for the creation of the BW image and for the signal in phase and quadrature, necessary to generate the CFM and the PW Doppler.

The data arriving from the ITR are filtered, then the ultrasound data are divided in case of e BW image (2D and M-Mode) or CFM and PW and receive different elaborations.
The BW data are demodulated, filtered and elaborated (also according some parameters and filters set by the user) and then are sent directly to the BSC.

For the CFM and PW, starting from the data filtered, are generated the I and Q signals.
Also them receive different elaborations in case they are for CFM or for the PW Doppler and after all the elaborations are sent to the DCP.

For the management of all the functions on board, there are is one DSP with its SDRAM.
On it all the SW is stored at the start-up and every time it's necessary.
The DSP is in communication with some internal PLD and FPGA, which manage all the functions of the board and all the communication processes IN/OUT.

There is a dedicated communication channel between DIP and IMC, where the DIP receives all the necessary data to manage the US information arriving from the ITRs.

IMC (9501092000)

The IMC (Input Master Controller) manages different processes inside the unit:

-receives from the BLC all the necessary SW to program the front end (ICS, ITR and ICC)
-it generates the sync and the timings necessary to acquire the US images
-it controls the system gain and applies it during the various elaborations of the image
-it checks the current necessary to generate the high voltage bang (high tension AT from SPR) and stops the unit in case of troubles
-it check the temperature for the TEE probes
-it manages the communication of the ICS and receives all the information about the probe connected. After the data are sent to the PC group in order to set the correct parameters of the probe and to show on the monitor the probe in the probe selection menu.
-it manages the probe switch according the probe selected by the user

At the start-up the board receives from the BLC all the SW necessary to set itself and the front end. Then the board start to check the presence of the boards ITR, ISC and ICC programs them. At the end the board informs the BLC that all has been performed.
The internal DSP generates all the sync and all the focalization data necessary to process the various bangs. Also the gain to apply to the image is controlled by this board.
The control of the current sent to the ITRs, to generate the bangs, is performed in order to control the power of the emission and to check for conditions of fault.
In case of current out of range, the board can reduce it automatically or can disable the high voltage in case of short circuit.
The IMC doesn't check any other voltage sent out from the power supply group. The BLC makes this operation.

For the TEE control there is a dedicated part of the board which controls the temperature and stops the system in case it reaches dangerous values.

For the control of the probe selection the IMC receives from the ICS the information about the probe connected.
When a probe had been selected it controls that the ICS enables the connector and that the bang are correctly sent from the ITR.

DCP (9501094000)

The DCP (Digital Color Processor) is the responsible about the creation of the CFM and Doppler trace (PW and CW).

From the DIP the board receives the I and Q components (for CFM and PW).
The mentioned data (digital) enter in a block of memory ready for the next elaborations.
The data are filtered and elaborated also with the post processing settings.
For the next elaborations of the CFM there are some DSPs, where the data are elaborated (vertical filtering, persistence, noise rejection….).
After al the elaborations the data arrive to one DSP, which will send all to the BSC.
For the PW the data from the memories arrive in one DSP which perform all the possible elaborations.
In this DSP the audio signal is generated.
The video data are sent to the another DSP and then out to the BSC.
The audio is directly sent to the PVA inside the PC group for the next elaborations.
The CW data from the ICC are first converted from analog to digital, then are elaborated as the PW.
The same thing for the audio which is managed by the same DSP and then sent, as before, to the PVA.

For all the communications between the board and the BLC there is a DSP.
This component manages all the process at the start-up.
It receives the programs from the BLC and answers all the requests. Also it manages all the internal processes according the settings selected.

DEP (9501095000)

The DEP (Digital Extended Processing) is a board dedicated for post processing elaborations on the BW image.
In case the particular filtering is selected, from the DIP board the BW signal arrives to the DCP (it's not received directly from the BSC).
The DCP simply passes the signal to the DEP, without any elaboration.
On the DEP the BW signal is elaborated by some DSPs according the filtering selected and then the result is sent to the BSC for the scan correlation.

Also the DEP is programmed by the BLC.

BSC (9501097000)

The BSC (Back-end Scan Converter) performs all the operations of scan converter of the unit.
From the DIP (or from the DEP) arrives the 2D and M; they are stored in the cine memory. The same is done for the CFM and Doppler data (both PW and CW).
This is to compensate possible delay in the transmission of the data due to the elaborations.
From the cine memory the data arrives in a memory where are mixed all the components, in order to create all the modalities (2D+CFM, M+CFM….).
After all the elaborations the video data is sent to the BLC.

For the ECG the data from the PSE arrives to the board where it's mixed with the other US signals.

In the board is also present the cine memory of the unit.
The Cine data are stored in internal dynamic memories, ready to be visualized.

BLC (9501099000)

The BLC (Back Link Control) is the interface between the PC group and the rest of the unit.
This board receives from the BSC the video data. They are stored in two video memories, one for the live condition and another for the storage of images and clips or for other processes as the 3D.
The live image is sent to the PVA board to be visualized on the screen of the unit.

At the start-up the BLC reads from one internal flash memory the HW composition of the system and checks that it's correct.
In case it's necessary it programs again the flash.
It programs directly all the boards of the back end (DIP, DCP, BSC, DEP) and the IMC (which will program the front end).
After, it communicates with the PC group by the PLC (board inside the PC group) and downloads all the SW necessary to boot the unit, or to set again the unit after a modification of the system's condition.
Also controls all the communications processes of the unit and check the power supply group in order to see if it provides the right voltages outside.

Inside the board there is a ROM device (ID button) where are stored all the passwords of the unit. In case of the replacement of the part it's necessary to replace also this device and insert it in the new board.

Power Supply Group

4 different boards compose the power supply group: Mains power, SPR, SPS and PSE.

MAINS POWER (9501140000)

The main input plug, the unit switch and the insulation transformer to supply the peripherals, compose this group.

The line voltage is connected to the main switch of the unit. The line voltage is sent to the SPS (where it will be transformed in DC voltage) and to the insulation transformer, which will supply the peripherals of the unit (monitor, printers, VTR…).

On this group there is the switch to select the line voltage between 220 or 115Vac.

Both the lines to the SPS and to the peripherals are protected by fuses.

SPS (9501100000)

The SPS (Switch power supply) receives the live voltage from the Mains Power group and generates one DC voltage of 15 V.

This 15Vdc is sent to the SPR and to the PSE; starting this voltage the SPR will create all the necessary DC voltages of the unit; the PSE all the necessary voltages for all the boards of the PC group, the keyboard and the display.

On the SPS it's generated also one variable DC voltage (in a range between 7 to 15 Vdc) which supplies the fans of the unit. This voltage increases its value with the internal temperature of the unit.

This board generates the +5V (DC) for the stand-by.

As soon as the mains switch is on, the SPS creates the +5 and sends it to the PSE.

From this board the voltage is sent to the PC motherboard and to the keyboard group (on/off key).

SPR MyLab Gold Platform (9501101000)

The SPR (Switch Power Regulator) receives the 15Vdc from the SPS and generates all the necessary output voltages of the unit: +1.8Vdc, +3.3Vdc, +3.6Vdc, ± 6Vdc, ± 12Vdc, +5Vdc, AT (high tension for the bangs, DC voltage variable according the probe and the power of emission selected).

On boards there are some control blocks, which set automatically the AT voltage according the probe selected.

The board is controlled by the IMC (this part controls the current necessary for the AT by a check in the ITR) and the BLC, which check that all the

voltages are in range and there aren't short circuits or high values of current absorbed.

SPR MyLab 70 (9501102000)

The SPR (Switch Power Regulator) for the MyLab 70 works in the same way as the previous one. It receives the 15Vdc from the SPS and generates all the necessary output voltages of the unit: +1.8Vdc, +3.3Vdc, +3.6Vdc, ± 6Vdc, ± 12Vdc, +5Vdc, AT (high tension for the bangs, DC voltage variable according the probe and the power of emission selected). The only difference is that the board generates also one negative high tension for the bangs (-AT) necessary to drive the ITRs for MyLab 70.

For this reason this board is not compatible with the MyLab Gold Platform units.

On boards there are some control blocks, which set automatically the AT voltage according the probe selected.

The board is controlled by the IMC (this part controls the current necessary for the AT by a check in the ITR) and the BLC, which check that all the voltages are in range and there aren't short circuits or high values of current absorbed.

PSE (9501109000)

The PSE (PC Supply ECG) is responsible about the creation of the line voltages necessary of the boards inside the PC group, for the keyboard group and for the display group.

This board is positioned inside the PC group (in the metallic chassis of the PC).

Starting from the 15Vdc of the SPS the board generates ± 5Vdc, +3.3Vdc, ± 12Vdc necessary for all the boards inside the PC group.

The board receives from the SPS the stand-by voltage for the boot and sends it to the PC motherboard and to the keyboard group (on/off key).

As soon as the key is pushed the PSE start to supply the PC and the unit starts.

The PSE supplies the keyboard group and the display group through the AKCP board.

On the PSE there is also the ECG. On board there is a connector for the patient cable.

The signal is amplified, filtered and converted from analog to digital.

After, through one optoinsulator (to insulate the ECG part from the rest of the unit for safety reasons), the ECG signal is sent to the BSC for the next elaborations.

KEYBOARD GROUP MyLab Gold Platform (9102639000)

The keyboard group is composed by the Keyboard Control board (KC code 9501106000), the alphanumeric keyboard, the trackball and the Keyboard Switch board (KS code 9501107000).

This assembly manages all the communications between the user and the unit.

The on the KS are positioned all the function keys, the encoders (for Gain 2D, CFM….) and there is the connection for the trackball. Every command is sent to the KC (where are also positioned the TCG sliders) and where there is the controller of the keyboard group.

On this board is also connected the alphanumeric keyboard.

By two flat cables, the KC is connected to the display group.

The keyboard group doesn't send directly all the data to the PC, but it passes through the display group.

KEYBOARD GROUP MyLab 70 (9102639500)

Also the keyboard group for MyLab 70 is composed by the Keyboard Control board (KC code 9501106000), the alphanumeric keyboard, the trackball and the Keyboard Switch board (KS code 9501107000). The difference with the other model is in the layout of the keys. The system is able to recognize by itself the type of unit and to set the various keys according the unit.

DISPLAY GROUP MyLab Gold Platform (9102706000)

This group is composed by the Keyboard Display board (KD code 9501108000) and from a Display LCD.

The KD board is the interface between the keyboard group and the PC.

By two flat cables it receives all the keyboard commands (it communicates with the KC).

On board there are two PS2 connectors for the alphanumeric keyboard and for the trackball (used as mouse).

Both are wired to the PC motherboard. All the other commands are sent to the PC via USB (on this board there is a standard USB connector dedicated for this communication process).

From the PSE arrives all the supply for the display and for the keyboard group.

The Display group also drives the LCD display, which shows different menu according the system set-up and the user selection.

On board there are some encoders on the sides of the Display which changes the parameter indicated on the display.

On the KD arrives also the audio signal (already amplified) from PVA and then is sent to the speakers.

DISPLAY GROUP MyLab 70 (9102706500)

This group is composed by the Keyboard Display board for MyLab 70 (KD code 9501211000) and from ten little displays LCD.

The KD board is the interface between the keyboard group and the PC.

By two flat cables it receives all the keyboard commands (it communicates with the KC).

On the KD board there are two PS2 connectors for the alphanumeric keyboard and for the trackball (used as mouse).

Both are wired to the PC motherboard. All the other commands are sent to the PC via USB (on this board there is a standard USB connector dedicated for this communication process).

From the PSE arrives all the supply for the display and for the keyboard group.

The Display group also drives the LCD displays, which show different menu according the system set-up and the user selection.

On board there are some encoders on the sides of the Display which changes the parameter indicated on the display.

On the KD arrives also the audio signal (already amplified) from PVA and then is sent to the speakers.

PC GROUP

The PC Group is composed by the following part:

PC motherboard, VGA board, Hard Disk, PVA, PLC, SoundBlaster, Video grabber, AKCP, VCP and PSE.

The PSE has been described inside the power supply group but physically it's located inside the PC box.

PC MOTHERBOARD and PC PERIPHERALS

Inside the unit there is a standard PC motherboard equipped with USB, LAN, PS2 connectors for keyboard and mouse, parallel, serial...

The processor is a 3.2 GB (or superior) and the HDD is a serial ATA 80GB (or superior).

From the display group there are two PS2 cables that connect the trackball (used as mouse) and the alphanumeric keyboard.

The motherboard controls the external peripherals 5"1/4 (DVD Drive, CD..).

Via USB arrives all the other commands from the keyboard; from the motherboard they are sent via PCI bus to the PLC and from this board to the rest of the unit.

The VGA board send out the video sync. and the overlay to the PVA.

In the HDD there is all the SW for the unit; at the start-up the PC reads it and via PCI send it to the PLC.

The PVA receives the audio Doppler signal from DCP.

The SoundBlaster receives the audio from the VTR and from the frontal microphone.

Using one external cable jack/jack it sends all the audio signal to the PVA.

The Video Grabber receives the Video signal from the VTR in order to show it on the screen.

PVA (9501110000)

The PVA (PC Video Adapter) receives the US video signal from BLC and the overlay from the VGA board.

It mixes the two signals and sends out the result to the monitor or to the video peripherals (BW analog. Printer, VTR…).

It receives from the VGA the video sync and sends it to the BLC.

From the SoundBlaster it receives the audio signals from VTR and microphone. From DCP it receives the audio Doppler.

Inside the PVA all them are amplified, sent to the Display Group and then to the speakers.

From the Frame Grabber it receives the VTR video signals and visualize them to the monitor.

PLC (9501105000)

The PLC (PC Link Control) is responsible about al the communication processes between the PC group and the rest of the unit.

It sends out to the BLC all the SW necessary to start the unit, all the commands by keyboard, the focalization data and all the commands necessary to set-up the unit according the probe and the preset. Also receives every data that has to be stored on the HDD (images for the internal databases…).

All the communications of the data received from BLC and for the BLC to/from the PC are done by PCI bus.

AKCP (9501168000)

The AKCP (Audio Keyboard Control Panel) is one interface board.

On it, from the PSE, arrive the voltages to supply the Display and the keyboard group and, by a connector 15 pins, a cable send them to the mentioned boards.

Also there are the connectors for the footswitch, for the audio out for VTR, Headphones and one audio input, where it arrives the audio from the SoundBlaster (for the PVA).

All the audio out arrives from the PVA.

VCP (9501169000)

The VCP (Video Connector Panel) is the interface for the video signals.

On it there is one auxiliary VGA, the video output for the VTR, for a BW printer (composite), the remote control for the VTR and one testing connector.

ELECTRIC AND SCHEMATICS DIAGRAMS

All the diagrams are not enclosed and confidential. The invoice of them, after an official request, is subordinate at the approval of the Factory.

Chapter 5

MyLab70 Probes

This chapter provides a list of **MyLab70** probes with their main characteristics.

These probes have very different characteristics, so it is important to understand the differences to choose the best probe for the exam to be performed.

The probe characteristics are related principally to the geometry and the frequency.

Geometry

Depending upon the probe's geometry the characteristic of the ultrasound beam are changing and so a different type of image is made.

In particular the probe geometry is related to the transducer geometry. The transducer is the part of the probe that transforms the electric signal in acoustic signal and vice versa. The types of transducer used with **MyLab** systems are: Linear, Convex, Phased Array and Doppler.

Linear probes

Linear probes (Linear Array) produce lines of view perpendicular to the transducer elements.

They are indicated for applications with a constant field of view and they have a good definition in the whole field of view.

Convex probes

The convex probes (Convex Array) produce lines of view perpendicular to the transducer elements.

They are indicated for applications that require a wide field of view in depth.

Phased Array probes

The Phased Array probes produce lines of view with angle variable with respect to the transducer elements.

They are indicated for applications with a limited acoustic window (i.e. intercostal window)

Doppler probes

The Doppler probes are non-imaging probes that allow visualizing the Doppler signal. Thanks to the probes' very small surface, they allow acquisition of the signal from very small acoustic windows.

Linear/Convex probes

The Linear/Convex probes are probes with two different transducers: one linear and one convex that allow for two different scan planes.

Frequency

In a probe the work frequency is related to the capability to penetrate in the body tissues. Low frequencies allow studying the deeper tissues, high frequencies allow to study the superficial tissues.

Convex Probes

	Code	Frequency range [MHz]	Aperture [mm]	Elevation [mm]	ROC [mm]	Maximum immersion level
CA123	9600158000	9-5	22.4	4.2	14	Up to 3 cm from transducer head
CA421	9600154000	5-2	57.6	12	40	Up to 3 cm from transducer head
CA431	9600177000	8-1		12	40	Up to 3 cm from transducer head
CA621	9600155000	7-3	63.4	12	60	Up to 3 cm from transducer head

Linear Probes

	Code	Frequency range [MHz]	Aperture [mm]	Elevation [mm]	ROC [mm]	Maximum immersion level
LA435	9600173000	18-6		3	-	Up to 3 cm from transducer head
LA522	9600163000	9-2	50	6	-	Up to 3 cm from transducer head
LA523	9600156000	13-4	50	5	-	Up to 3 cm from transducer head

Phased Array Probes

	Code	Frequency range [MHz]	Aperture [mm]	Elevation [mm]	ROC [mm]	Maximum immersion level
PA122	9600152000	8-3	16	10	-	Up to 3 cm from transducer head

Specialty Probes

	Code	Frequency range [MHz]	Aperture [mm]	Elevation [mm]	ROC [mm]	Maximum immersion level
EC123	9600157000	9-4	34.6	4.2	-	Up to 25 cm from transducer head

Doppler Probes

	Code	Frequency range [MHz]	Aperture [mm]	Elevation [mm]	ROC [mm]	Maximum immersion level
5 CW	9600126000	5	-	-	-	Up to 6 cm from transducer surface

Environmental conditions

The functional, store and transport environment conditions follow:

Property	In use	Store/Transport
Temperature	+10°C ÷ +40°C	-10°C ÷ +50°C
Humidity	30% ÷ 75% RH	10% ÷ 95% RH
Pressure	700 ÷ 1060 hPa	500 ÷ 1060 hPa

MyLab is designed for operators who are qualified in using ultrasound systems.

Clinical Applications

When fully configured, the system offers a variety of intended uses.

> **Note**
>
> The operator must always follow the principle known as ALARA (As Low As Reasonably Achievable) and, in particular with this application, must use minimum acoustic power for the minimum time compatible with obtaining diagnostic information.

MyLab70 Probes

The following paragraphs lists the **MyLab70** probes and their intended clinical use.

	ABD	BRE	GYN	MSK	OB	SP	THY	URO	VAS
CA Probes									
CA123	✓					✓	✓		✓
CA421	✓		✓		✓			✓	✓
CA431	✓		✓		✓			✓	✓
CA621	✓		✓		✓			✓	✓
LA Probes									
LA435		✓		✓		✓	✓		✓
LA522		✓		✓		✓	✓		✓
LA523		✓		✓		✓	✓		✓
PA Probes									
PA230	✓								
Specialty Probes									
EC123			✓		✓			✓	
Doppler Probes									
5 CW									✓

ABD: Abdominal; **BRE**: Breast; **GYN**: Gynecologic; **MSK**: Musculo-skeletal conventional and superficial; **OB**: Obstetric; **SP**: Small Parts; **THY**: Thyroid; **URO**: Urologic; **VAS**: Vascular.

WARNING

Do not use MyLab for ophthalmic or transorbital applications.

Cardiac Applications

The probe applies ultrasound energy through the thoracic cavity to obtain an image of the heart sufficient for evaluating any cardiac abnormalities. In Doppler modes, the probe applies energy through the thoracic cavity to determine the velocity and direction of blood in the heart and vessels.

Vascular Applications

The probe applies ultrasound energy through the neck or the limbs of a patient in order to obtain an image of the carotid artery or of other peripheral vessels. These images show the possible presence of abnormalities or obstructions of the vessels. In Doppler modes, the probe applies ultrasound energy through the neck or the hands/feet of a patient in order to evaluate blood velocity, flow or lack of flow, and the perviousness of the peripheral vessels.

Abdominal Applications

The probe applies ultrasound energy through the patient abdomen to obtain an image of the abdominal organs to detect abnormalities (imaging) and assess the blood velocity, flow and patency of abdominal vessels through the Doppler modalities. Using harmonics reduces acoustic noise and improves the image.

Small Parts Applications

The probe applies ultrasound energy through the skin to obtain an image or a Doppler flow visualization of small organs such as the thyroid (neck), testicles (scrotal sac) and breast (breast).

Musculoskeletal Applications

The probe applies ultrasound energy through the skin to obtain an image of tendons, ligaments and muscles and to determine blood flow patterns and velocities.

OB/Fetal Applications

The probe applies ultrasound energy through a pregnant woman's abdomen to obtain an image of the fetus to detect structural abnormalities, to visualize and measure anatomic and physiologic parameters of the fetus for the purpose of assessing fetal growth. In Doppler modes, the probe applies energy through the patient abdomen to detect placental or fetal flows abnormalities. Using harmonics reduces acoustic noise and improves the image.

Neonatal Head Applications

The probe applies ultrasound energy through the neonatal head fontanelles to visualize brain structures (imaging) or flow (Doppler) to detect structural or functional abnormalities.

TCD Adult Applications

The probe applies ultrasound energy through the adult patient skull to obtain an image of cerebrovascular vessels or to visualize flow to detect functional abnormalities.

Transesophageal Cardiac Applications

The probe applies ultrasound energy through the esophagus or the stomach to obtain an image of the heart for purpose of assessing cardiac abnormalities. In Doppler modes, the probe applies energy through the esophagus or the

stomach to determine the velocity and direction of blood in the heart and in the vessels.

Transrectal Applications

The probe applies ultrasound energy through the rectal wall to image the prostate and related structures to detect structural or functional abnormalities.

Transvaginal Applications

The probe applies ultrasound energy through the vaginal wall to image the genital organs to detect structural or functional abnormalities.

Pediatric Applications

Some transducers can be used to obtain images and to detect flows for pediatric studies.

Probe introduction

When fully configured, the system offers a variety of intended uses.

Introduced with release 2.0

The following table lists the **MyLab70** probes and the release of introduction.

	1.00	1.10
CA Probes		
CA123	✓	✓
CA421	✓	✓
CA431	✓	✓
CA621	✓	✓
LA Probes		
LA435	✓	✓
LA522	✓	✓
LA523	✓	✓
PA Probes		
PA230	✓	✓
Specialty Probes		
EC123	✓	✓
Doppler Probes		
5 CW	✓	✓

Chapter 6

Traceable Parts

This chapter deals with all the parts of **MyLab70** and **MyLab Gold Platform** whose serial number may be associated to the unit's serial number, in order to find out all the customers who have a particular part installed in the equipment.

This procedure will help the service technician to operate on all the units which could have troubles with a defective part; if this part is traceable the location of the defective units is immediate. The list of traceable part is in the next tables.

Traceable Parts for MyLab70

Code's List with traceable S/N for code 9706150000

CODE	ITEM
9501087100	"6150" ICS INPUT CONN. SWITCH
9501090000	"6150" ITR INPUT TX-RX
9501091000	"61xx" ICC INPUT CW/CLOCK
9501092000	"61xx" IMC INP.MASTER CONTROL
9501093000	"61xx" DIP DIGITAL IMAGE PROC.
9501094000	"61xx" DCP DIGITAL COLOR PROC.
9501095000	"61xx" DEP DIGITAL EXTEN.PROC.
9501097000	"61xx" BSC BACK SCAN CONVERTER
9501099000	"61xx" BLC BACK LINK CONTROL
9501100000	"61xx" SPS SWITCH POWER SUPPLY
9501102000	"6150" SPR SWITCH POWER REGULATOR
9501103000	"61xx" BMB BUS MOTHER BOARD
9501140000	"61xx" MAINS POWER

Code's List with traceable S/N for code 9102639500

CODE	DESCRIPTION
9501106000	61xx KC KEYBOARD CONTROL
9501107000	61xx KS KEYBOARD SWITCH

Code's List with traceable S/N for code 9102706500

CODE	DESCRIPTION
9501211000	6150 KD KEYBOARD DISPLAY

Code's List with traceable S/N for code 9102854000

CODE	DESCRIPTION
9102854000	MONITOR

Traceable Parts for MyLab Gold Platform

Code's List with traceable S/N for code 9706100000

CODE	ITEM
9501087000	"6100" ICS INPUT CONN. SWITCH
9501089000	"6100" ITR INPUT TX-RX
9501091000	"61xx" ICC INPUT CW/CLOCK
9501092000	"61xx" IMC INP.MASTER CONTROL
9501093000	"61xx" DIP DIGITAL IMAGE PROC.
9501094000	"61xx" DCP DIGITAL COLOR PROC.
9501095000	"61xx" DEP DIGITAL EXTEN.PROC.
9501097000	"61xx" BSC BACK SCAN CONVERTER
9501099000	"61xx" BLC BACK LINK CONTROL
9501100000	"61xx" SPS SWITCH POWER SUPPLY
9501101000	"6100" SPR SWITCH POWER REGULATOR
9501103000	"61xx" BMB BUS MOTHER BOARD
9501140000	"61xx" MAINS POWER

Code's List with traceable S/N for code 9102639000

CODE	DESCRIPTION
9501106000	61xx KC KEYBOARD CONTROL
9501107000	61xx KS KEYBOARD SWITCH

Code's List with traceable S/N for code 9102706000

CODE	DESCRIPTION
9501108000	6100 KD KEYBOARD DISPLAY

Code's List with traceable S/N for code 9102854000

CODE	DESCRIPTION
9102854000	MONITOR

Code's List with traceable S/N for code 9102572100

CODE	DESCRIPTION
9102586000	CPU+HDD
9501105000	"61xx" PLC PC Link Control
9501109000	"61xx" PSE PC Supply ECG
9501110000	"61xx" PVA PC Video Adapter

Code's List with traceable S/N for code 9102586000

CODE	DESCRIPTION
9730630056	ATI Video Board
9730630057	Frame Grabber
9730630064	Mother Board
9730650083	HDD

Chapter 7

Part Lists

MyLab70 Boards

CODE	ITEM
9501087100	"6150" ICS INPUT CONN. SWITCH
9501090000	"6150" ITR INPUT TX-RX
9501091000	"61xx" ICC INPUT CW/CLOCK
9501092000	"61xx" IMC INP.MASTER CONTROL
9501093000	"61xx" DIP DIGITAL IMAGE PROC.
9501094000	"61xx" DCP DIGITAL COLOR PROC.
9501095000	"61xx" DEP DIGITAL EXTEN.PROC. (also available for the MyLab 70 units, as part of a module with the PC Group MyLab Gold Platform)
9501097000	"61xx" BSC BACK SCAN CONVERTER
9501099000	"61xx" BLC BACK LINK CONTROL
9501100000	"61xx" SPS SWITCH POWER SUPPLY
9501102000	"6150" SPR SWITCH POWER REGULATOR
9501103000	"61xx" BMB BUS MOTHER BOARD
9501140000	"61XX" MAINS POWER
9501172000	"61xx" UHP USB&HEADPHONE PANEL
9501173000	"61xx" FAN CONNECTOR BOARD
9102854000	MONITOR
9730650084	COMBO CD WRITER/DVD READER

MyLabGold Platform Boards

CODE	ITEM
9501087000	"6100" ICS INPUT CONN. SWITCH
9501089000	"6100" ITR INPUT TX-RX
9501091000	"61xx" ICC INPUT CW/CLOCK
9501092000	"61xx" IMC INP.MASTER CONTROL
9501093000	"61xx" DIP DIGITAL IMAGE PROC.
9501094000	"61xx" DCP DIGITAL COLOR PROC.
9501095000	"61xx" DEP DIGITAL EXTEN.PROC.
9501097000	"61xx" BSC BACK SCAN CONVERTER
9501099000	"61xx" BLC BACK LINK CONTROL
9501100000	"61xx" SPS SWITCH POWER SUPPLY
9501101000	"6100" SPR SWITCH POWER REGULATOR
9501103000	"61xx" BMB BUS MOTHER BOARD
9501140000	"61XX" MAINS POWER
9501172000	"61xx" UHP USB&HEADPHONE PANEL
9501173000	"61xx" FAN CONNECTOR BOARD
9102854000	MONITOR
9730650037	CD ROM
9730650085	DVD WRITER

PC Group

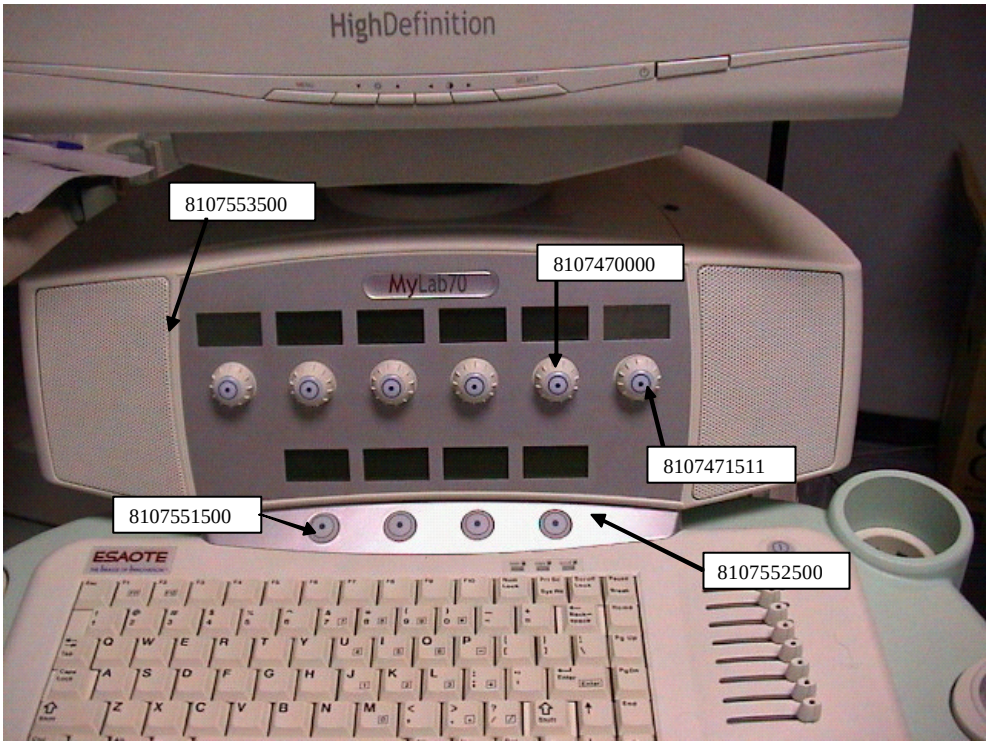
CODE	ITEM
9102572000	MYLAB70 - PC UNIT
9102572100	MyLab Gold Platform - PC UNIT (also available for the MyLab 70 units, as part of a module with the DEP board)

Available Boards inside the PC Groups (MyLab70 and MyLab Gold Platform)

CODE	ITEM
9501105000	"61xx" PLC PC LINK CONTROL
9501109000	"61xx" PSE PC SUPPLY ECG
9501110000	"61xx" PVA PC VIDEO ADAPTER
9501168000	"61xx" AUDIO & KEYBOARD CONNECTOR PANEL
9501169000	"61xx" VIDEO CONNECTOR PANEL
9730650091	HDD SPARE

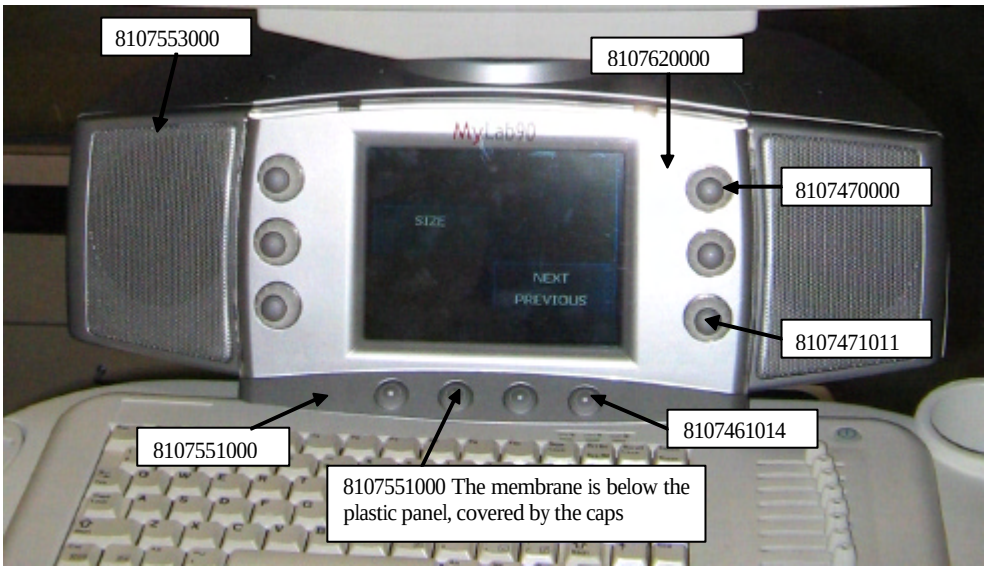
MyLab70 Display Group

CODE	ITEM
9102706500	WHOLE DISPLAY GROUP (complete group assembled with plastic panel, keys, displays and electronic parts)
8107470000	Small display knob
8107471511	Display knob switch cap (plastic)
8107551500	Membrane for lower keys display group
8107552500	Frontal plastic panel for lower keys display group
8107553500	Frontal plastic panel display and speakers
9501211000	KD (KEYBOARD DISPLAY) board



MyLab Gold Platform Display Group

CODE	ITEM
9102706000	WHOLE DISPLAY GROUP (complete group assembled with plastic panel, keys, displays and electronic parts)
8107461014	Cap for display keys
8107470000	Small display knob
8107471011	Display knob switch cap (plastic)
8107551000	Membrane for lower keys display group
8107552000	Frontal plastic panel for lower keys display group
8107553000	Frontal plastic panel display and speakers
8107620000	Transparent cover for display
9501108000	KD (KEYBOARD DISPLAY) board



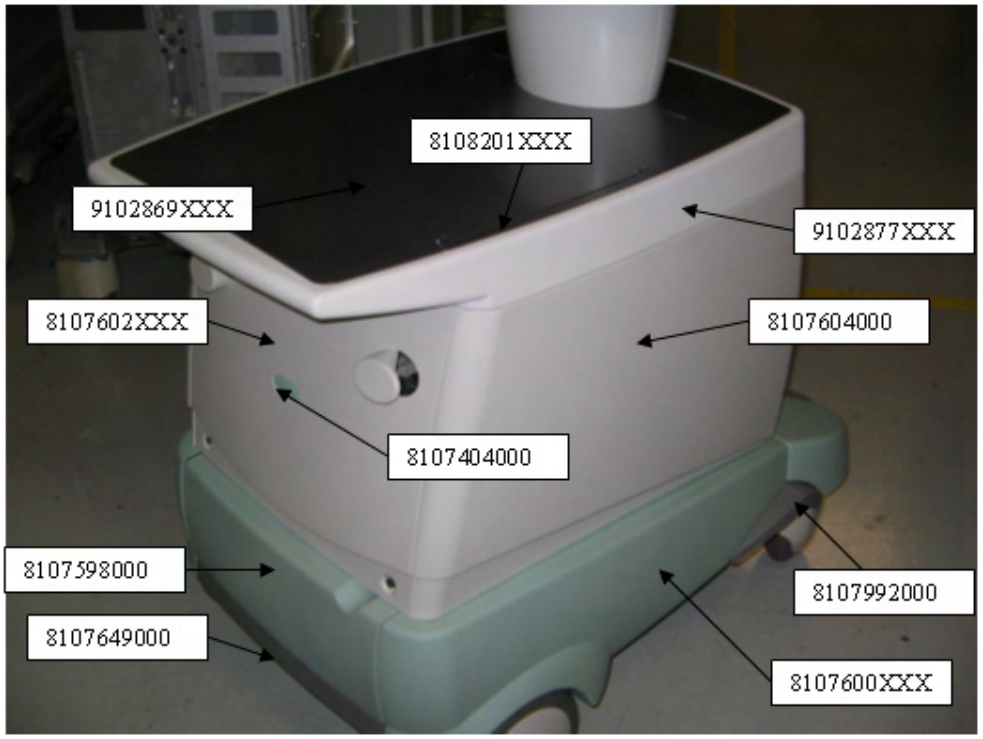
Plastic Parts

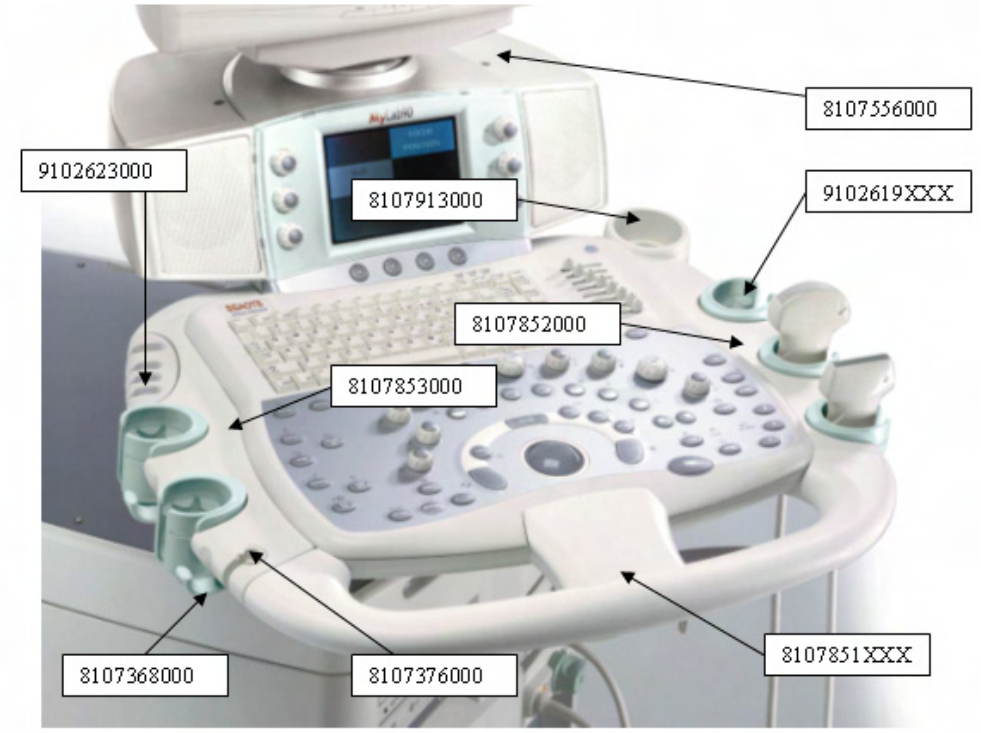
MyLab70 Plastic Parts

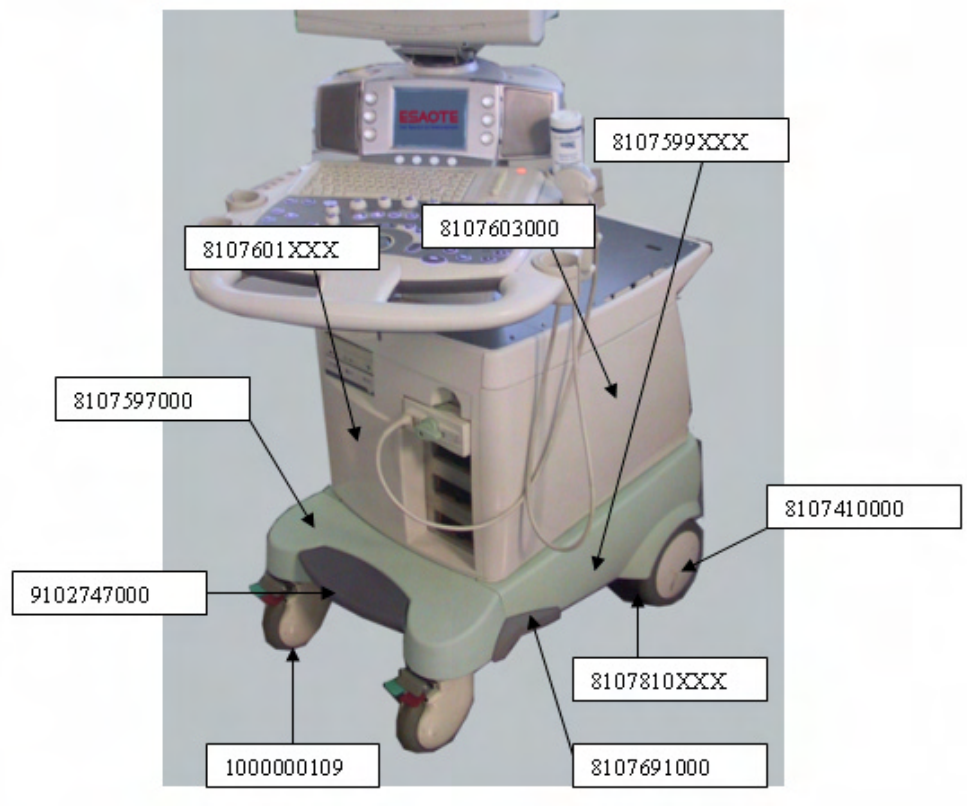
CODE	ITEM
(*) 8107366000	Probe holder white
(*) 8107367000	Elastic element inside the probe holder
8107368000	Hook for probe cables
8107376000	Holder for pencil probes
8107404000	Green label backside panel
8107556000	Rear cover for Display group
8107597000	Frontal bumper
8107598000	Backside bumper
8107599500	Right bumper
8107600500	Left bumper
8107601500	Frontal plastic panel
8107602500	Backside plastic panel
8107603000	Right plastic panel
8107604000	Left plastic panel
8107624000	Plate “No Parking”
8107649000	Backside rising handle
8107691000	Right rising handle
8107992000	Left rising handle
8107851000	Green frontal handle
8107852000	Right probe holder handle
8107853000	Left probe holder handle
8107858000	Handle for rotation block
8107913000	Gel holder
8107946510	Frontal metallic cover for upper plastic panel
8108201500	Little lateral metallic insert for top cover
8108424000	Fixed frontal cover for clumn
8108425000	Fixed back cover for column
8108426000	Mobile column cover (half shell-the column is covered by two equal half shells)
8108473000	Plate keyboard lock
9102256001	Peripheral fixing cables
(*) 9102619000	Probe holder assembled (composed by the codes 8107366000 and 8107367000)
9102623000	Support for ECG cable
9102869510	Metallic cover for upper plastic panel (for peripherals)
9102877500	Upper plastic panel

MyLabGold Platform Plastic Parts

CODE	ITEM
(*) 8107366010	Probe holder green
(*) 8107367000	Elastic element inside the probe holder
8107368000	Hook for probe cables
8107376000	Holder for pencil probes
8107404000	Green label backside panel
8107556000	Rear cover for Display group
8107597000	Frontal bumper
8107598000	Backside bumper
8107599000	Right bumper
8107600000	Left bumper
8107601000	Frontal plastic panel
8107602000	Backside plastic panel
8107603000	Right plastic panel
8107604000	Left plastic panel
8107649000	Backside rising handle
8107691000	Right rising handle
8107992000	Left rising handle
8107851010	White frontal handle
8107852010	Right probe holder handle
8107853010	Left probe holder handle
8107858000	Handle for rotation block
8107913000	Gel holder
8108201500	Little lateral metallic insert for top cover
8108424000	Fixed frontal cover for clumn
8108425000	Fixed back cover for column
8108426000	Mobile column cover (half shell-the column is covered by two equal half shells)
8108427000	Internal cover column
9102256001	Peripheral fixing cables
(*) 9102619010	Probe holder assembled (composed by the codes 8107366010 and 8107367000)
9102623000	Support for ECG cable
9102747000	Footpedal
9102869000	Metallic cover for upper plastic panel (for peripherals)
9102877000	Upper plastic panel
9102903000	Frontal metallic cover for upper plastic panel


8108201XXX
9102869XXX
9102877XXX
8107602XXX
8107604000
8107404000
8107598000
8107992000
8107649000
8107600XXX


8107556000
9102623000
8107913000
9102619XXX
8107852000
8107853000
8107368000
8107376000
8107851XXX


8107599XXX
8107603000
8107601XXX
8107597000
8107410000
9102747000
8107810XXX
1000000109
8107691000

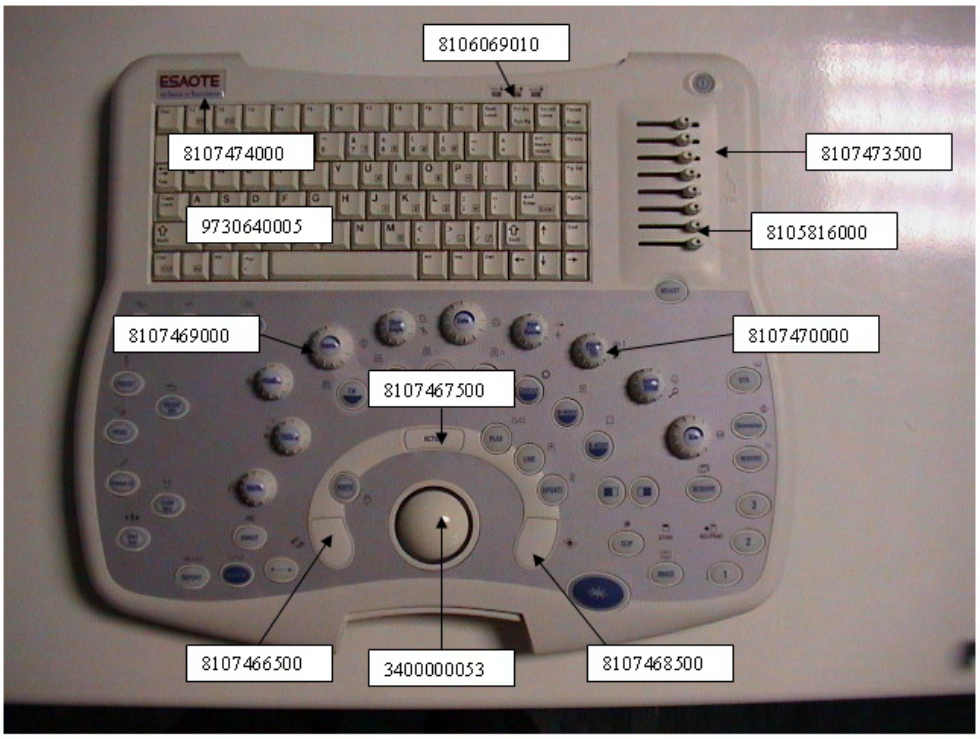

8107946510 (in case of MyLab 70)
9102903000 (in case of MyLab 90)
9102256001

Keyboard Parts

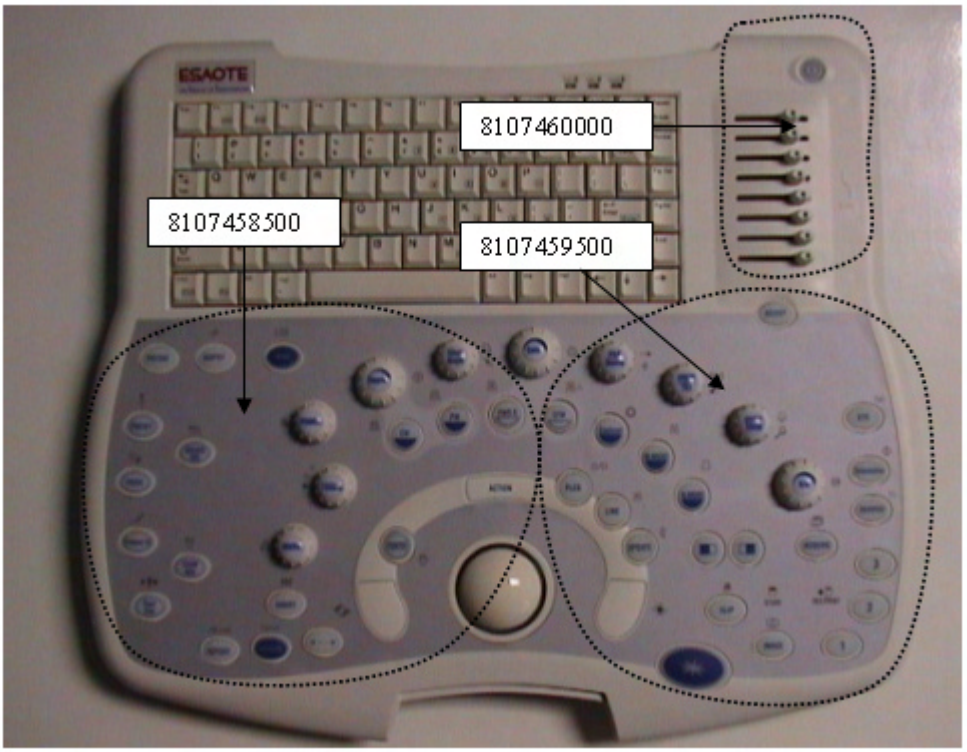
MyLab70 Keyboard Parts

CODE	ITEM
9102639500	Whole assembled keyboard group
3400000053	Trackball
8105816000	Slider knob
8106069010	Keyboard plate (num lock..)
8107458500	Rubber membrane (distance, …)
8107459500	Rubber membrane (freeze, …)
8107460000	Rubber membrane (on off key)
8107466500	Left mouse key
8107467500	Central mouse key
8107468500	Right mouse key
8107469000	Big Encoder knob
8107470000	Small encoder knob
8107471501	Switch for encoder printed “MARK”
8107471502	Switch for encoder printed "TOOLS"
8107471503	Switch for encoder printed "POWER"
8107471504	Switch for encoder printed "DOPPLER"
8107471507	Switch for encoder printed "PRF/BASELINE"
8107471508	Switch for encoder printed "FREQ/TEI"
8107471509	Switch for encoder printed "B/M"
8107471510	Switch for encoder printed "DEPTH/ZOOM"
8107471512	Switch for encoder printed "STEER/ANGLE"
8107471513	Switch for encoder printed "COLOR"
8107473500	Plastic keyboard
8107474000	Label for plastic keyboard
9501106000	KC (KEYBOARD CONTROL)
9501107000	KS (KEYBOARD SWITCH)
9730640005	Alphanumeric keyboard

The various switches (code 8107471XXX) are plastic switches placed in the middle of the encoder knobs. Every name indicates the function printed on the plastic part.
They allow the user to push the switch placed on the printed circuit.



Whole assembled keyboard for MyLab 70



MyLab Gold Platform Keyboard Parts

CODE	ITEM
9102639000	Whole assembled keyboard group
3400000052	Trackball
8105816000	Slider knob
8106069010	Keyboard plate (num lock..)
8107458000	Rubber membrane (not printed)
8107459000	Rubber membrane (not printed)
8107460000	Rubber membrane (ID key)
8107461001	Cap for membrane printed "POINTER"
8107461002	Cap for membrane printed "PLEX"
8107461003	Cap for membrane printed "LINE"
8107461004	Cap for membrane printed "UPDATE"
8107461005	Cap for membrane printed "CW"
8107461006	Cap for membrane printed "PW"
8107461007	Cap for membrane printed "PWR D"
8107461008	Cap for membrane printed "CFM"
8107461009	Cap for membrane printed "CONTRAST"
8107461010	Cap for membrane printed "M-MODE"
8107461011	Cap for membrane printed "B-MODE"
8107461012	Cap for membrane printed "SYMBOL LEFT"
8107461013	Cap for membrane printed "SYMBOL RIGHT"
8107462001	Cap for membrane printed "SYMBOL DISTANCE"
8107462002	Cap for membrane printed "ANNOT"
8107462003	Cap for membrane printed "MEASURE"
8107462004	Cap for membrane printed "REPORT"
8107462005	Cap for membrane printed "START END"
8107462006	Cap for membrane printed "EXAM REV"
8107462007	Cap for membrane printed "PATIENT ID"
8107462008	Cap for membrane printed "PROBE"
8107462009	Cap for membrane printed "ARCHIVE REV"
8107462010	Cap for membrane printed "PRESET"
8107462011	Cap for membrane printed "PHYSIO"
8107462012	Cap for membrane printed "BIOPSY"
8107462013	Cap for membrane printed "MENU"
8107462014	Cap for membrane printed "ADJUST"
8107462015	Cap for membrane printed "VTR"
8107462016	Cap for membrane printed "ORIENTATION"
8107462017	Cap for membrane printed "REVERSE"
8107462018	Cap for membrane printed "ACQUIRE"
8107462019	Cap for membrane printed "3"
8107462020	Cap for membrane printed "2"
8107462021	Cap for membrane printed "1"
8107462022	Cap for membrane printed "IMAGE"
8107462023	Cap for membrane printed "CLIP"
8107463001	Cap for membrane printed "FREEZE"
8197466000	Left mouse key
8107467000	Central mouse key
8197468000	Right mouse key
8107469000	Big Encoder knob
8107470000	Smal encoder knob

8107471001	Switch for encoder printed “MARK”
8107471002	Switch for encoder printed "TOOLS"
8107471003	Switch for encoder printed "POWER"
8107471004	Switch for encoder printed "DOPPLER"
8107471007	Switch for encoder printed "PRF/BASELINE"
8107471008	Switch for encoder printed "FREQ/TEI"
8107471009	Switch for encoder printed "B/M"
8107471010	Switch for encoder printed "DEPTH/ZOOM"
8107471012	Switch for encoder printed "STEER/ANGLE"
8107471013	Switch for encoder printed "COLOR"
8107473500	Plastic keyboard
8107474000	Label for plastic keyboard
9501106000	KC (KEYBOARD CONTROL)
9501107000	KS (KEYBOARD SWITCH)
9730640005	Alphanumeric keyboard

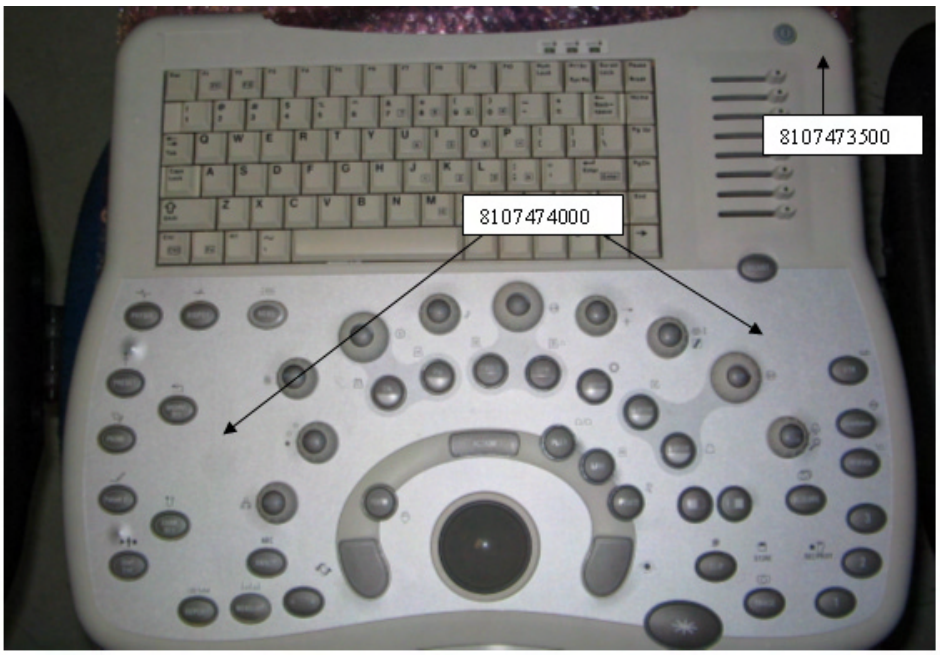
In the Mylab Gold Platform the membrane is not printed.

Every rubber key has on it a printed plastic cap with the related function of the key (all the codes 8107461XXX, 8107462XXX and the 8107463001 are single caps).

The dimension of the rubber membranes are the same of the MyLab 70 , so please refer to the previous image.

The various switches (code 8107471XXX) are plastic switch placed in the middle of the encoder knobs. Every name indicates the function printed on the plastic part.

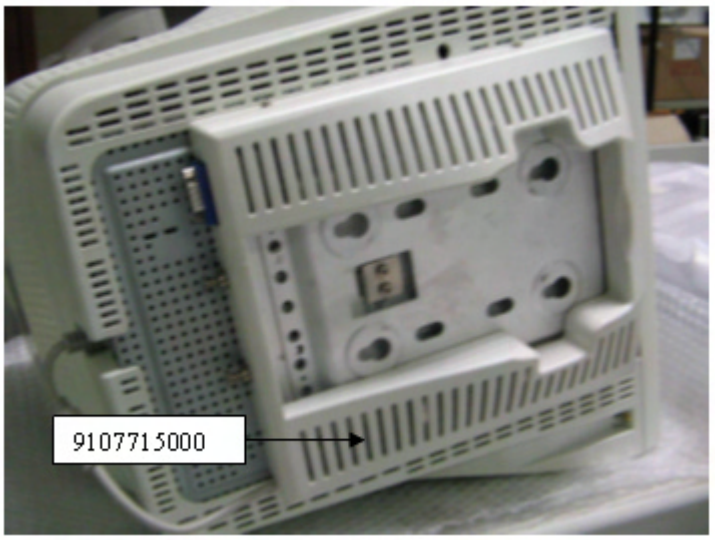
They allow the user to push the switch placed on the printed circuit.



Whole keyboard group MyLab Gold Platform.

Monitor Plastic Parts

CODE	ITEM
9107715000	Cover for monitor support



Various

CODE	ITEM
1000000109	Frontal wheel
5900000009	System's speaker
8107810500	Rear wheel MyLab 70
8107810000	Rear wheel MyLab Gold Platform
8107410000	Plastic cover for rear wheel MyLab 70 and Gold Platform
8107971011	Label "MyLab 70"
9102581500	Cooling group MyLab 70
9102581000	Cooling group MyLab Gold Platform
9102819000	Assembled fan for PC Group
9102821000	Spare fan for cooling group MyLab 70 and Gold Platform

Chapter 8

Troubleshooting

The purpose of this chapter is to give some suggestion, in order to verify the most common problems that may happen on **MyLab 70** and **MyLab Gold Platform** units (now indicated as **MyLab**).
It's very important that every time there is a problem to send all information possible: s/n and software version of the unit defective, a picture of the defect with a description of it and, the following files that the unit creates:

Echos_logxxx.log

On these files are written the result of some checks that the unit makes as self-diagnostic, or report written when a fault happens.
It's important to underline that, not all the defect creates a report.
For this reason all the information available are very important.

In the same folder there is another file named

platformsetup.log

which summarize the result of every SW installation in the unit.
This is useful in case of problems during the setup to understand which is the defective process, or if a mistake has been done.

How to enter as administrator

There are two ways to access to the system, one that gives the full controls on all the programs, with the possibility to explore the hard disk, add/remove programs without any protection and another similar but with less rights.
The modalities are only for service purposes and they have to be used only by service technicians.

The first modality (Administrator with full control) is by using one USB Service key code 8100264000:

-it's necessary to connect the key to one of the frontal USB plugs (with unit off), then turn on the system. With the USB service key connected, the system starts till Windows XP and it's possible to enter in the various menu of the unit, add/remove programs/SW/files

Figure 1 (USB Service key)

Figure 2 (key inserted)

The second modality (with less rights) is protected by password and to enter in this way (Administrator with less rights) it's necessary to follow the next instructions:

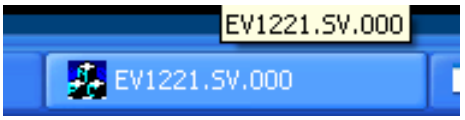
-it's necessary to push the shift key as soon as the system starts; in the windows of login that will appear it's necessary to write in the user field "Administrator" and the password is "laser". Compared with the service key this way has less rights.

How to simulate a probe

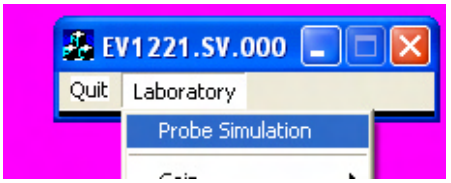
-Enter as Administrator (with full control by using USB service key) and wait till Win XP ends the boot steps.

-run MyLab program with a double click on the icon "Start" on the desktop

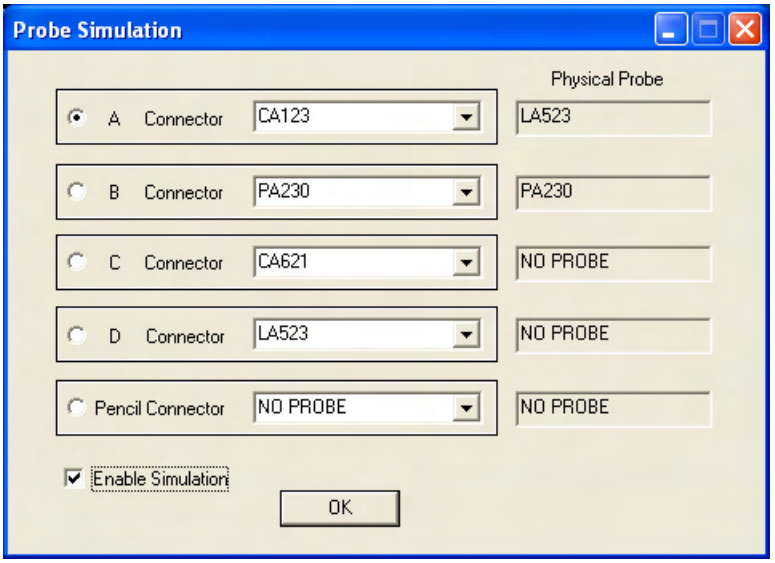
-when the probe selection mask appear, with "CTRL" and "ESC" enable the taskbar and select the SW icon



-will appear the following mask, select "Laboratory" and then "Probe simulation", click on it



-will appear the following mask, select the checkbox “Enable Simulation” and select a connector and a probe



Replacement of a board

To remove the board follows the instructions of the Chapter 3.
After the insertion of a new board the system will recognize it and will program it without problems (unless compatibility problems with the SW release).

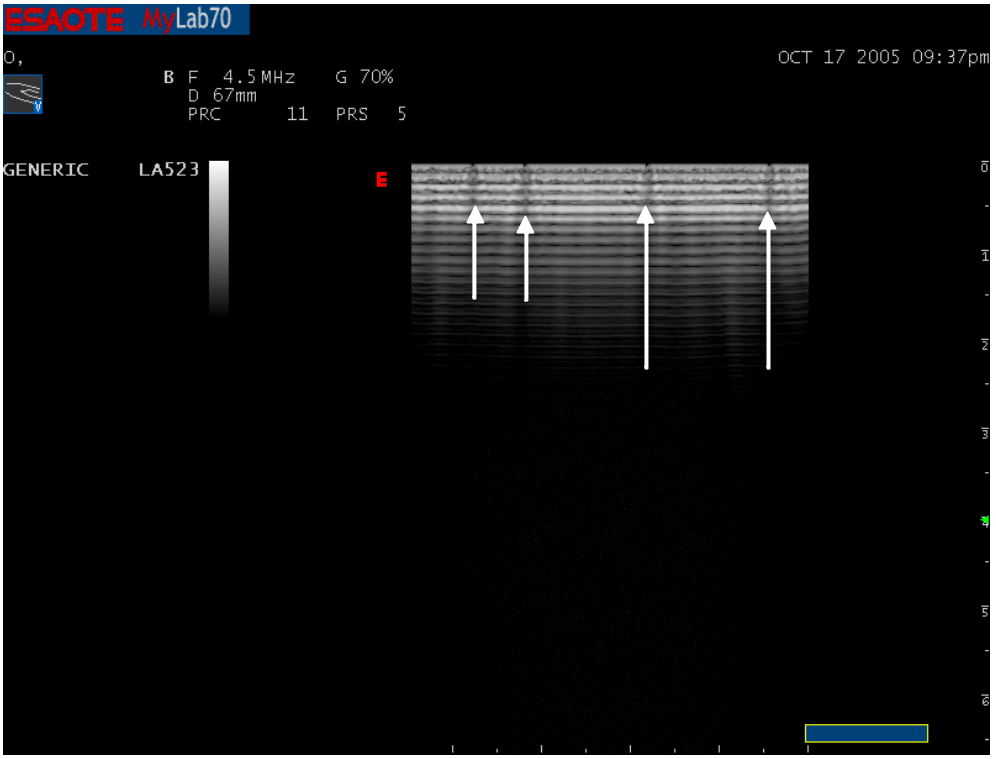
COMPATIBILITY TABLE MYLAB 70 AND MYLAB GOLD PLATFORM

MyLab 70	MyLab Gold Platform	Notes
9501103000 BMB (BUS MOTHER BOARD)	9501103000 BMB (BUS MOTHER BOARD)	Same for both units
9501087100 ICS (INPUT CONNECTOR SWITCH)	9501087000 ICS (INPUT CONNECTOR SWITCH)	Different and not compatible between MyLab 70 and Gold Platform
9501090000 ITR (INPUT TX-RX)	9501089000 ITR (INPUT TX-RX)	Different and not compatible between MyLab 70 and Gold Platform
9501091000 ICC (INPUT CW/CLOCK)	9501091000 ICC (INPUT CW/CLOCK)	Same for both units
9501092000 IMC (INPUT MASTER CONTROL)	9501092000 IMC (INPUT MASTER CONTROL)	Same for both units
9501093000 DIP (DIGITAL IMAGE PROCESSING)	9501093000 DIP (DIGITAL IMAGE PROCESSING)	Same for both units
9501094000 DCP (DIGITAL COLOR PROCESSING)	9501094000 DCP (DIGITAL COLOR PROCESSING)	Same for both units
9501095000 DEP (DIGITAL EXTENDED PROCESSING)	9501095000 DEP (DIGITAL EXTENDED PROCESSING)	For the MyLab 70 this board is optional (is a part of a module with the the PC Group code 9102572100)
9501097000 BSC (BACK SCAN CONVERTER)	9501097000 BSC (BACK SCAN CONVERTER)	Same for both units
9501099000 BLC (BACK LINK CONTROL)	9501099000 BLC (BACK LINK CONTROL)	Same for both units
9501100000 SPS (SWITCH POWER SUPPLY)	9501100000 SPS (SWITCH POWER SUPPLY)	Same for both units
9501102000 SPR 6150 (SWITCH POWER REGULATOR)	9501101000 SPR 6100 (SWITCH POWER REGULATOR)	Different and not compatible between MyLab 70 and Gold Platform
9501140000 MAINS POWER	9501140000 MAINS POWER	Same for both units
9102586000 PC UNIT	9102586000 PC UNIT	In the first production units
9102572000/100 PC UNIT	9102572100 PC UNIT	For the MyLab 70 the code 100 is a part of one optional module, always assembled with the DEP
9101109000 PSE (PC SUPPLY ECG)	9101109000 PSE (PC SUPPLY ECG)	Inside the PC group
9501105000 PLC (PC LINK CONTROL)	9501105000 PLC (PC LINK CONTROL)	Inside the PC group
9501110000 PVA (PC VIDEO ADAPTER)	9501110000 PVA (PC VIDEO ADAPTER)	Inside the PC group
9102715000 AKCP+VCP	9102715000 AKCP+VCP	Composed by 9501168000 AKCP (AUDIO AND KEYBOARD CONTROL PANEL) and 9501169000 VCP (VIDEO CONNECTOR PANEL)
9501172000 UHP (USB & HEADPHONES PANEL)	9501172000 UHP (USB & HEADPHONES PANEL)	Same for both units
9102706500 DISPLAY GROUP 6150	9102706000 DISPLAY GROUP 6100	Different and not compatible between MyLab 70 and Gold Platform
9102639500 WHOLE KEYBOARD GROUP 6150	9102639000 WHOLE KEYBOARD GROUP 6100	Different and not compatible between MyLab 70 and Gold Platform
9102854000 MONITOR	9102854000 MONITOR	Same for both units

Problems on the system

Problem: some channels are missing (see next figure)

Solution: ITR defective.



defective

Problem: No image (all black):
Solution: ITR completely off, BSC or DIP broken

Problem: The keyboard doesn't start at all (not lighted, the keys doesn't respond, system error message on the screen, display not lighted)
Solution: Cable not connected in the connector C9 in the AKCP, display group defective (

Problem: Black vertical lines in the image
Solution: Probe defective, ITR defective, ICS defective

Problem: No CW at all
Solution: ICC or DCP defective

Problem: CFM intermittent or with noise
Solution: DCP or DIP defective

Problem: CFM with lines of noise
Solution: DCP or DIP defective, ITR defective (check also for BW problems)

Problem: CFM and PW with noise
Solution: DIP or DCP defective

Problem: NO CFM (or PW) at all
Solution: DIP, DCP or BSC defective

Problem: Wrong palette
Solution: BLC defective

Problem: Selecting the PW the system stops with a system error message
Solution: DCP defective

Problem: Colors missing or wrong in the monitor
Solution: PVA defective or monitor broken

Problem: Image with horizontal line and divided in two parts
Solution: BSC defective

Problem: The CINE doesn't work correctly
Solution: BSC defective

Problem: Moving the CFM box the system stops with system error message
Solution: BSC or DCP defective

Problem: Image with little dots
Solution: BSC defective

Problem: No audio to the speakers
Solution: PVA or display group defective (if it's only the audio doppler but the VTR is ok is the DCP)

Problem: The unit doesn't start at all
Solution: If the on/off key is not lighted try to replace the keyboard group, display group, PSE, SPS, SPR

Problem: The unit doesn't start at all
Solution: It the on/off key is lighted try to replace the BLC, PC group, keyboard group

How to download the error files

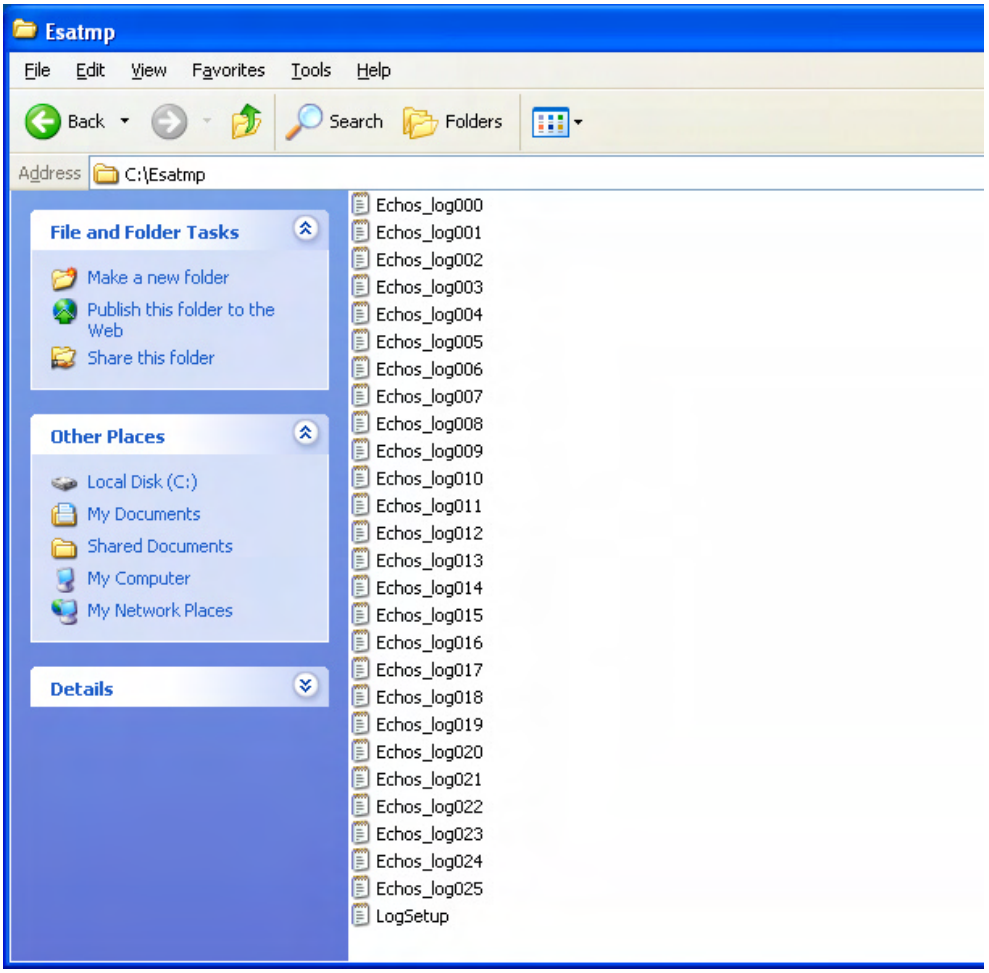
Every time the system turns on, it creates a report in a dedicated file:
The file is named

Echos_logxxx

and it's stored in

C:\Esatemp

Inside the mentioned files there is a report about the status of the unit (SW release, SW processes started) and about the status of the various boards inside the unit.
If one of them is in error a report will be created.



Reading inside the files it's possible to have the situation of the unit.
The files are accessible starting the unit as administrator (both the ways) and it's possible to download them by using one USB key or by the network.

How to read the error files

The first time the file is opened it's necessary to select the application to read it.
It's possible to use the "WordPad" Sw.

Inside the file are indicated different information about the unit (SW release, boot of the boards…)

The following data is one example of a normal situaton:

```
Wed Dec 14 16:01:53 2005

Log File Name.....................: Echos_log021.log
Max File Dimension...[default value]: 1024KB
Log Files Number..................: 50
Enable Level Mask.................: 0x00000001


16:01:54.578    SW Version =   ---  Build = EV1187.O.000
16:01:54.578    Start: System Start Up
16:01:54.578    Start: Arguments: -ogwl
16:01:56.187    Start: End StartUp from Vtr.exe
16:01:56.234    Start: End StartUp from Gwl.exe
16:01:56.421    Start: End StartUp from Kbd.exe
16:01:56.484    Start: End StartUp from BioCom.exe
16:01:56.593    Start: End StartUp from Ecom.exe
16:01:57.859    Start: End StartUp from Executor.exe
16:01:59.218    Gws: IPC message size: 3440
16:02:00.453    Start: End StartUp from Gws.exe
16:02:00.453    Start: Send Go 0x4473
16:02:02.656
------------------------------------------------------------------------
Hardware configuration
I-Button: 2e-d4b9b15-01
    Slot:[BLC]
      Error Code:[0]
      Hardware Code: Model:6100,Comp:1,Rev:0, Dsp:TMS5502
      Firmware Code: Ver:1,Rev:0,Build:132
      Pld Code: Ver:1,Rev:0,Build:e
      Pld Code: Ver:0,Rev:0,Build:3
    Slot:[BSC]
      Error Code:[0]
      Hardware Code: Model:6100,Comp:0,Rev:0, Dsp:TMS6713
      Firmware Code: Ver:1,Rev:5a,Build:3e
      Pld Code: Ver:0,Rev:0,Build:1
    Slot:[DEP]
      Error Code:[0]
      Hardware Code: Model:6100,Comp:0,Rev:0, Dsp:TMS6713
      Firmware Code: Ver:1,Rev:0,Build:5ad
      Pld Code: Ver:0,Rev:0,Build:3
    Slot:[DCP]
      Error Code:[0]
      Hardware Code: Model:6100,Comp:0,Rev:0, Dsp:TMS6713
      Firmware Code: Ver:0,Rev:1,Build:419
      Pld Code: Ver:0,Rev:0,Build:0
```

```
Slot:[DIP]
  Error Code:[0]
  Hardware Code: Model:6100,Comp:1,Rev:0, Dsp:TMS5502
  Firmware Code: Ver:4,Rev:0,Build:6a
  Pld Code: Ver:0,Rev:0,Build:1
  Pld Code: Ver:1,Rev:0,Build:2
Slot:[IMC]
  Error Code:[0]
  Hardware Code: Model:6100,Comp:2,Rev:0, Dsp:TMS5502
  Firmware Code: Ver:2,Rev:0,Build:69
  Pld Code: Ver:0,Rev:0,Build:4
  Pld Code: Ver:0,Rev:0,Build:0
Slot:[ICC]
  Error Code:[0]
  Hardware Code: Model:6100,Comp:0,Rev:1
  Firmware Code: Ver:0,Rev:0,Build:1e
  Pld Code: Ver:0,Rev:0,Build:0
Slot:[ITR1]
  Error Code:[0]
  Hardware Code: Model:6150,Comp:0,Rev:0
  Firmware Code: Ver:0,Rev:0,Build:d0
  Pld Code: Ver:0,Rev:0,Build:0
Slot:[ITR2]
  Error Code:[0]
  Hardware Code: Model:6150,Comp:0,Rev:0
  Firmware Code: Ver:0,Rev:0,Build:d0
  Pld Code: Ver:0,Rev:0,Build:0
Slot:[ITR3]
  Error Code:[0]
  Hardware Code: Model:6150,Comp:0,Rev:0
  Firmware Code: Ver:0,Rev:0,Build:d0
  Pld Code: Ver:0,Rev:0,Build:0
Slot:[ITR4]
  Error Code:[0]
  Hardware Code: Model:6150,Comp:0,Rev:0
  Firmware Code: Ver:0,Rev:0,Build:d0
  Pld Code: Ver:0,Rev:0,Build:0
Slot:[ITR5]
  Error Code:[0]
  Hardware Code: Model:6150,Comp:0,Rev:0
  Firmware Code: Ver:0,Rev:0,Build:d0
  Pld Code: Ver:0,Rev:0,Build:0
Slot:[ITR6]
  Error Code:[0]
  Hardware Code: Model:6150,Comp:0,Rev:0
  Firmware Code: Ver:0,Rev:0,Build:d0
  Pld Code: Ver:0,Rev:0,Build:0
Slot:[ITR7]
  Error Code:[0]
  Hardware Code: Model:6150,Comp:0,Rev:0
  Firmware Code: Ver:0,Rev:0,Build:d0
  Pld Code: Ver:0,Rev:0,Build:0
Slot:[ITR8]
  Error Code:[0]
  Hardware Code: Model:6150,Comp:0,Rev:0
  Firmware Code: Ver:0,Rev:0,Build:d0
  Pld Code: Ver:0,Rev:0,Build:0
Slot:[ITR9]
  Error Code:[0]
  Hardware Code: Model:6150,Comp:0,Rev:0
  Firmware Code: Ver:0,Rev:0,Build:d0
  Pld Code: Ver:0,Rev:0,Build:0
Slot:[ITR10]
```

```
      Error Code:[0]
      Hardware Code: Model:6150,Comp:0,Rev:0
      Firmware Code: Ver:0,Rev:0,Build:d0
      Pld Code: Ver:0,Rev:0,Build:0
    Slot:[ITR11]
      Error Code:[0]
      Hardware Code: Model:6150,Comp:0,Rev:0
      Firmware Code: Ver:0,Rev:0,Build:d0
      Pld Code: Ver:0,Rev:0,Build:0
    Slot:[ITR12]
      Error Code:[0]
      Hardware Code: Model:6150,Comp:0,Rev:0
      Firmware Code: Ver:0,Rev:0,Build:d0
      Pld Code: Ver:0,Rev:0,Build:0
    Slot:[ICS]
      Error Code:[0]
      Hardware Code: Model:6150,Comp:0,Rev:0
      Firmware Code: Ver:0,Rev:0,Build:e
      Pld Code: Ver:0,Rev:0,Build:2
    Slot:[SPR]
      Error Code:[0]
      Hardware Code: Model:6150,Comp:0,Rev:1
      Firmware Code: Ver:ff,Rev:ff,Build:ffff
      Pld Code: Ver:0,Rev:0,Build:0
      Pld Code: Ver:0,Rev:0,Build:6
    Slot:[SPS]
      Error Code:[0]
      Hardware Code: Model:6100,Comp:0,Rev:0
      Firmware Code: Ver:ff,Rev:ff,Build:ffff
    Slot:[BMB]
      Error Code:[0]
      Hardware Code: Model:6100,Comp:1,Rev:0
      Firmware Code: Ver:ff,Rev:ff,Build:ffff
    Slot:[PVA]
      Error Code:[0]
      Hardware Code: Model:6100,Comp:0,Rev:0
      Pld Code: Ver:0,Rev:0,Build:3
    Slot:[PLC]
      Error Code:[0]
      Hardware Code: Model:6100,Comp:0,Rev:0
      Pld Code: Ver:0,Rev:0,Build:0

16:02:04.562
-------------------------------------------------------------------------
KeyBoardHardware configuration
General Ver: 109
File Card Ver: 4abf195c0501003e
Falsh Programmed: 1
Dsp Ver: 4abf195c01000067
FPGA1 Name: 4abead2e01000013
FPGA2 Name: 4abe2fb60100000f
Font Ver: 101004000000000
Font Code Name: LATIN1

16:02:14.953    Gws : Found Hauppauge WinTV Capture
```

The voice Hardware configuration checks if all the boards started correctly without problems.
For example

```
Slot:[SPR]
      Error Code:[0]
```

This message means that the SPR board started correctly (the error code is 0). Every time the error code is zero it means that the board was able to boot in the right way.

In the following condition (for example):

```
Slot:[DEP]
      Error Code:[19]
```

it means that the DEP board was not able to start correctly at the boot.

In case a mistake appears during the run time (so when the unit is in live) the Echos_log file also add a little dump inside.
In some boards directly controlled by the BLC, there is a location of memory where a report is written in case of error.
The board(s) which is (are) in trouble is (are) indicated in a dedicated line inside the file (see example below).
In case of more than one board is necessary to check all the parts involved.

In the following example there is a dump inside the Echos_log file.

```
Wed Dec 14 13:25:06 2005

Log File Name.....................: Echos_log017.log
Max File Dimension...[default value]: 1024KB
Log Files Number..................: 50
Enable Level Mask.................: 0x00000001


13:25:06.453    SW Version =   ---  Build = EV1187.O.000
13:25:06.453    Start: System Start Up
13:25:06.468    Start: Arguments: -ogwl
13:25:06.750    Start: End StartUp from Kbd.exe
13:25:06.750    Start: End StartUp from Vtr.exe
13:25:06.750    Start: End StartUp from Ecom.exe
13:25:06.812    Start: End StartUp from BioCom.exe
13:25:06.953    Start: End StartUp from Gwl.exe
13:25:07.218    Gws: IPC message size: 3440
13:25:07.328    Start: End StartUp from Gws.exe
13:25:08.359    Gws : Found Hauppauge WinTV Capture
13:25:08.453    Start: End StartUp from Executor.exe
13:25:08.468    Start: Send Go 0x4473
13:25:08.843
------------------------------------------------------------------
Hardware configuration
```

```
I-Button: 2e-d4b9b15-01
    Slot:[BLC]
      Error Code:[0]
      Hardware Code: Model:6100,Comp:1,Rev:0, Dsp:TMS5502
      Firmware Code: Ver:1,Rev:0,Build:132
      Pld Code: Ver:1,Rev:0,Build:e
      Pld Code: Ver:0,Rev:0,Build:3
    Slot:[BSC]
      Error Code:[0]
      Hardware Code: Model:6100,Comp:0,Rev:0, Dsp:TMS6713
      Firmware Code: Ver:1,Rev:5a,Build:3e
      Pld Code: Ver:0,Rev:0,Build:1
    Slot:[DEP]
      Error Code:[0]
      Hardware Code: Model:6100,Comp:0,Rev:0, Dsp:TMS6713
      Firmware Code: Ver:1,Rev:0,Build:5ad
      Pld Code: Ver:0,Rev:0,Build:3
    Slot:[DCP]
      Error Code:[0]
      Hardware Code: Model:6100,Comp:0,Rev:0, Dsp:TMS6713
      Firmware Code: Ver:0,Rev:1,Build:419
      Pld Code: Ver:0,Rev:0,Build:0
    Slot:[DIP]
      Error Code:[0]
      Hardware Code: Model:6100,Comp:1,Rev:0, Dsp:TMS5502
      Firmware Code: Ver:4,Rev:0,Build:6a
      Pld Code: Ver:0,Rev:0,Build:1
      Pld Code: Ver:1,Rev:0,Build:2
    Slot:[IMC]
      Error Code:[0]
      Hardware Code: Model:6100,Comp:2,Rev:0, Dsp:TMS5502
      Firmware Code: Ver:2,Rev:0,Build:69
      Pld Code: Ver:0,Rev:0,Build:4
      Pld Code: Ver:0,Rev:0,Build:0
    Slot:[ICC]
      Error Code:[0]
      Hardware Code: Model:6100,Comp:0,Rev:1
      Firmware Code: Ver:0,Rev:0,Build:1e
      Pld Code: Ver:0,Rev:0,Build:0
    Slot:[ITR1]
      Error Code:[0]
      Hardware Code: Model:6150,Comp:0,Rev:0
      Firmware Code: Ver:0,Rev:0,Build:d0
      Pld Code: Ver:0,Rev:0,Build:0
    Slot:[ITR2]
      Error Code:[0]
      Hardware Code: Model:6150,Comp:0,Rev:0
      Firmware Code: Ver:0,Rev:0,Build:d0
      Pld Code: Ver:0,Rev:0,Build:0
    Slot:[ITR3]
      Error Code:[0]
      Hardware Code: Model:6150,Comp:0,Rev:0
      Firmware Code: Ver:0,Rev:0,Build:d0
      Pld Code: Ver:0,Rev:0,Build:0
    Slot:[ITR4]
      Error Code:[0]
      Hardware Code: Model:6150,Comp:0,Rev:0
      Firmware Code: Ver:0,Rev:0,Build:d0
      Pld Code: Ver:0,Rev:0,Build:0
    Slot:[ITR5]
      Error Code:[0]
      Hardware Code: Model:6150,Comp:0,Rev:0
      Firmware Code: Ver:0,Rev:0,Build:d0
```

```
  Pld Code: Ver:0,Rev:0,Build:0
Slot:[ITR6]
  Error Code:[0]
  Hardware Code: Model:6150,Comp:0,Rev:0
  Firmware Code: Ver:0,Rev:0,Build:d0
  Pld Code: Ver:0,Rev:0,Build:0
Slot:[ITR7]
  Error Code:[0]
  Hardware Code: Model:6150,Comp:0,Rev:0
  Firmware Code: Ver:0,Rev:0,Build:d0
  Pld Code: Ver:0,Rev:0,Build:0
Slot:[ITR8]
  Error Code:[0]
  Hardware Code: Model:6150,Comp:0,Rev:0
  Firmware Code: Ver:0,Rev:0,Build:d0
  Pld Code: Ver:0,Rev:0,Build:0
Slot:[ITR9]
  Error Code:[0]
  Hardware Code: Model:6150,Comp:0,Rev:0
  Firmware Code: Ver:0,Rev:0,Build:d0
  Pld Code: Ver:0,Rev:0,Build:0
Slot:[ITR10]
  Error Code:[0]
  Hardware Code: Model:6150,Comp:0,Rev:0
  Firmware Code: Ver:0,Rev:0,Build:d0
  Pld Code: Ver:0,Rev:0,Build:0
Slot:[ITR11]
  Error Code:[0]
  Hardware Code: Model:6150,Comp:0,Rev:0
  Firmware Code: Ver:0,Rev:0,Build:d0
  Pld Code: Ver:0,Rev:0,Build:0
Slot:[ITR12]
  Error Code:[0]
  Hardware Code: Model:6150,Comp:0,Rev:0
  Firmware Code: Ver:0,Rev:0,Build:d0
  Pld Code: Ver:0,Rev:0,Build:0
Slot:[ICS]
  Error Code:[0]
  Hardware Code: Model:6150,Comp:0,Rev:0
  Firmware Code: Ver:0,Rev:0,Build:e
  Pld Code: Ver:0,Rev:0,Build:2
Slot:[SPR]
  Error Code:[0]
  Hardware Code: Model:6150,Comp:0,Rev:1
  Firmware Code: Ver:ff,Rev:ff,Build:ffff
  Pld Code: Ver:0,Rev:0,Build:0
  Pld Code: Ver:0,Rev:0,Build:6
Slot:[SPS]
  Error Code:[0]
  Hardware Code: Model:6100,Comp:0,Rev:0
  Firmware Code: Ver:ff,Rev:ff,Build:ffff
Slot:[BMB]
  Error Code:[0]
  Hardware Code: Model:6100,Comp:1,Rev:0
  Firmware Code: Ver:ff,Rev:ff,Build:ffff
Slot:[PVA]
  Error Code:[0]
  Hardware Code: Model:6100,Comp:0,Rev:0
  Pld Code: Ver:0,Rev:0,Build:3
Slot:[PLC]
  Error Code:[0]
  Hardware Code: Model:6100,Comp:0,Rev:0
  Pld Code: Ver:0,Rev:0,Build:0
```

```
13:25:10.718
--------------------------------------------------------------------------
KeyBoardHardware configuration
General Ver: 109
File Card Ver: 4abf195c0501003e
Falsh Programmed: 1
Dsp Ver: 4abf195c01000067
FPGA1 Name: 4abead2e01000013
FPGA2 Name: 4abe2fb60100000f
Font Ver: 101004000000000
Font Code Name: LATIN1

13:30:24.015
--------------------------------------------------------------------------
|              FIRMWARE EQUIPMENT ERROR DETECTED.                 |
--------------------------------------------------------------------------

13:30:24.078    Number Dump        = 6
13:30:24.078    Mask RTB Error     = 0x0100 [IMC]
13:30:24.078    Mask RTB Present   = 0x01eb
[PC|BLC|BSC|DEP|DCP|DIP|IMC]
13:30:24.078    Device     = BLC
13:30:24.078    BLC Status = 0
13:30:24.078    Dump: 0x0 0x0 0x0 0x0 0x0 0x0 0x0 0x0 0x0 0x0 0x0 0x0 0x0
0x0 0x0 0x0 0x0

13:30:24.078    Device     = BSC
13:30:24.078    BLC Status = 0
13:30:24.078    Dump: 0x0 0x0 0x0 0x0 0x0 0x0 0x0 0x0 0x0 0x0 0x0 0x0 0x0
0x0 0x0 0x0 0x0

13:30:24.078    Device     = DEP
13:30:24.078    BLC Status = 0
13:30:24.078    Dump: 0x0 0x0 0x0 0x0 0x0 0x0 0x0 0x0 0x0 0x0 0x0 0x0 0x0
0x0 0x0 0x0 0x0

13:30:24.078    Device     = DCP
13:30:24.078    BLC Status = 0
13:30:24.078    Dump: 0x0 0x0 0x0 0x0 0x0 0x0 0x0 0x0 0x0 0x0 0x0 0x0 0x0
0x0 0x0 0x0 0x0

13:30:24.078    Device     = DIP
13:30:24.078    BLC Status = 0
13:30:24.078    Dump: 0x0 0x0 0x0 0x0 0x0 0x0 0x0 0x0 0x0 0x0 0x0 0x0 0x0
0x0 0x0 0x0 0x0

13:30:24.078    Device     = IMC
13:30:24.078    BLC Status = 0
13:30:24.078    Dump: 0x5 0x3 0x21 0x0 0x0 0x0 0x0 0x0 0x0 0x0 0x0 0x0 0x0
0x0 0x0 0x0 0x0

13:30:32.171    Start: Quit received from Ecom.exe. Send Quit: 0x4473
13:30:32.171    Gws: MessageParser: Quit message received
13:30:32.171    Gws: OnClose entry
13:30:32.171    DisconnectToIpc: Exit
13:30:32.171    EcoFrame.cpp         2938    GWS: error
CEcoFrame::ManageTrackEnginePointer() - VKeyVarEcm
13:30:32.187    Start: The Process Gwl.exe has exited
13:30:32.187    Ecom exit
13:30:32.296    Start: The Process Ecom.exe has exited
13:30:32.296    Start: The Process Executor.exe has exited
13:30:32.390    Start: The Process Kbd.exe has exited
```

```
13:30:32.390    Start: The Process Vtr.exe has exited
13:30:33.593    Gws: OnClose exit
13:30:33.750    Start: The Process Gws.exe has exited
13:30:39.750    Start: Process BioCom.exe abnormal termination
13:30:39.968    Start: Process Esaote.Imaging.Dicom.Dinamo.Host.exe
Killed
13:30:40.078    Start: Process Esaote.PrintDispatcher.Host.exe Killed
13:30:40.187    Start: System is Down
```

Starting from the point

```
-----------------------------------------------------------------
|              FIRMWARE EQUIPMENT ERROR DETECTED.                |
-----------------------------------------------------------------
```

the dump of the memory starts.

The voice “Mask RTB Error” indicates which is (are) the board(s) in error (in the example the IMC)

```
13:30:24.078    Mask RTB Error     = 0x0100 [IMC]
```

(the voice 13:30:24…is the time when the problem appeared, the meaning of this information is the same for all the voices)

The voice

```
13:30:24.078    Mask RTB Present   = 0x01eb
[PC|BLC|BSC|DEP|DCP|DIP|IMC]
```

indicates the interfaces of the boards which has a direct communication channel with the BLC. This channel is named Real Time Bus.

The item [PC] doesn’t indicate th PC Group but a dedicated interface with the PC on the BLC (BLC-PLC link channel), so one error of [PC] indicates one internal error in the BLC.

After this point there is the dump of the location of memory , so the location where is written the error code is reported in the file:
The BLC for example has all the parameters to zero, so it means that has no error

```
13:30:24.078    Device     = BLC
13:30:24.078    BLC Status = 0
13:30:24.078     Dump: 0x0 0x0 0x0 0x0 0x0 0x0 0x0 0x0 0x0 0x0 0x0 0x0
0x0 0x0
```

Instead of the IMC has the location of error different from zero, so it means that detected one error. In this case the firs step is to check the board with the Dump different from zero (in this case the IMC):

```
13:30:24.078    Device     = IMC
13:30:24.078    BLC Status = 0
13:30:24.078    Dump: 0x5 0x3 0x21 0x0 0x0 0x0 0x0 0x0 0x0 0x0 0x0 0x0
0x0 0x0
```

In the same way, also if the voice BLC Status of a board is different from zero, it means that the mentioned board has some communication problems and it's necessary to check it.

Aftert that are listed all the processes SW which have been closed due to the error found in one board.

Chapter 9

Installation and planned maintenance notes

Installation instructions

This document deals with the procedures that must be performed in order to install a **MyLab70** and **MyLab Gold Platform** (now indicated all as **MyLab**) system in the proper way.

The Service Technician on the field must fill in the Installation Checklist enclosed in the document, and he must return it to his Service Department.

Tools and instruments:

Digital Multimeter

Normal Service instruments

Service Manual

Initial steps:

1. Compare the packing list to what was delivered.
2. Open the package and remove the system from the container.
   While handling the main unit, pay attention. It is necessary that at least two people perform this operation.
3. Open the package of the monitor and extract it.
4. Compare the serial numbers of the monitor, of the main unit and of the probes with the ones stamped in the packing list.
5. Inspect each one of the delivered modules to look for any physical damage.

HARDWARE INSTALLATION

For all the operations please refer to Service Manual, chapters 2 and 3.

1. Check the wheels and their functioning (brakes enclosed). Check all the mechanical parts
2. Insert the monitor on the upper part of the unit; block it. Connect the power supply and the video cables in the proper way.
3. If the footswitch has to be installed , connect the footswitch itself to the proper plug
4. if a peripheral (VTR , printer…) has to be installed connect it following the instructions of this Service Manual (chapter 2) , using the proper cables. If you need more details about the peripheral itself , please refer to the manual of the part.
5. Use the electric power cables found in the packages to connect the installed peripherals to the plugs placed in the unit (when it's allowed)
6. Check if the correct standard have been sent (line voltage STD and video STD). Check the fuses
7. Connect the main electric power cable to the power supply and to the wall socket.

SYSTEM VERIFICATION

1. Install one or more transducers.
2. Switch the system on. Verify that it boots correctly. If it doesn't, reset the unit. Check if messages of error appear. If the problem still persists refer to the troubleshooting (chapter 8) or contact the Service Dpt.
3. Check if the fans work properly. If the unit runs but the fans not, turn the machine off and check the fans. In this condition is very easy to damage all the internal boards.
4. All the installed probes must be identified in the proper way (check all the possible connectors).
5. Set the configuration of the unit as the customer wishes:
   a) Set local time and date;
   b) Set the right software configuration for the peripherals
   c) If a biopsy kit is being installed, perform a biopsy needle guide alignment (that must be done immersing the probe in the water).
      Verify the needle-guide lies on the scan-plane of the probe verifying that the biopsy needle, inserted in the guide, is visible in the ultrasound image in the whole depth of the field of sight of the probe.
      Verify that the position and the angle of insertion of the biopsy-

needle correspond to the ones expected in the biopsy procedure (see User Manual).

6. Take note the settings of the machine in the form (brightness , contrast , dimensions …).
7. If necessary, adjust the contrast and the brightness of the monitor
8. Verify the proper functioning of the machine by performing a scan. Use all the available transducers, and replace the ones which don't work properly, in terms of non-uniform imaging and missing elements. This test must be performed for all available functioning modes.
9. Test all the installed peripherals, and verify their functioning. If necessary, adjust the peripherals in order to get a good image quality. (Use the Instruction Manual of the peripherals).

CONCLUDING STEPS

1. Discuss the installation with the customer, and answer any question about the warranty and the maintenance of the system and of the transducers.
2. Complete the Installation Checklist and return it to the Service Department of the local Distributor

MyLab System Installation Checklist

Customer:		**Date:**	
Address:		**UNIT s/n**	
		Monitor s/n	
Phone:		**Peripheral : s/n :**	
Notes:		**Peripheral : s/n :**	
		Peripheral : s/n :	
Signature:		**Peripheral : s/n :**	

Fill in this form while performing the installation procedure. Mark the appropriate box after each single check. When completed, please return it to the Service Department of the local Distributor.

Software release: _____

Keyboard controls:

☐ left/right mouse keys
☐ Image
☐ Format L-C-R
☐ Freeze
☐ Preset Choosing
☐ Probes
☐ Post Processing
☐ Power

B / B+M / M functions:

☐ TGC
☐ processing
☐ Zoom
☐ Priority
☐ Other functions:
☐ Focus
☐ Update
☐ Ch. Frequency
☐ Sweep speed
☐ Depth
☐ Gain

_____

_____

PW/CW functions:

☐ Beam line
☐ Sample Vol.
☐ DPL angle
☐ Shift
☐ Other functions:

☐ Audio
☐ PRF
☐ Update
☐ Ch. Freq. Dpl.

☐ Filter
☐ DPL pre-proc.
☐ Gain
☐ Sweep speed

_____

_____

CFM functions

☐ Palette
☐ Box/Beamline
☐ CFM Param.
☐ Other functions:

☐ Power color
☐ Color Freq.
☐ Steer

☐ Filter
☐ PRF
☐ CFM gain

_____

_____

Graphic functions:

☐ Distance
☐ Area
☐ Other functions:

☐ Measure
☐ ID/Pat. Report

☐ Clear
☐ Cine

_____

_____

User functions

☐ Headphones
☐ Retrieve
☐ Aux. Output
☐ USB
☐ Other functions:

☐ VTR
☐ Mouse cursor
☐ LPT1
☐ Biopsy (set-up)

☐ Printer
☐ Menu
☐ Network port

_____

_____

Probes

Composition (KITS)

Problems and relative actions taken

PREVENTIVE MAINTENANCE

This section is intended to specify the recommended frequency to perform a Preventive Maintenance to the MyLab systems.
Periodic maintenance provides significant contribution to ongoing reliability and performance of the system.

The minimum frequency of PM inspection (Preventive Maintenance) is one per year

Anyway it is recommended to perform a PM inspection:

- Periodically. This period may vary from 3 months to 6 months, depending upon the operating environment.
- Following a customer request.

Tools and instruments

- Standard Service Tools
- Service Manual
- A Doppler Phantom (if available)

PROCEDURES

1. Ask the customer for any complain he may have, and discuss about the performances of the system. Note any problem or suggestion in the COMMENTS section of the checklist. Note the actions taken to solve the problems.
2. Visually inspect the unit , following the steps below :
   a) Visual inspection of the main unit, including the plastics, the connectors in the back , the 5”¼ drivers, the connectors for the transducers.
   b) Visual inspection of the monitor, including the control keys for the external adjustments, the plastics, the video and the cable.
   c) Visual inspection of the wheels, the foot brakes. Verify the stability of the whole system.
   d) Visually inspect the whole system for biohazard presence. Take the necessary action if biohazard presence is suspected. If not sure, treat the system as infected.
   e) Inspect the mechanical integrity of the system.
   f) Check the maneuverability of the keyboard by rotating it ; check the block of the keyboard.
   g) Check the maneuverability of the column and the block by moving it up and down.
   h) Check the maneuverability of the monitor by moving it. Check the block of the monitor.

3. Check all the installed electric power cables and look for any sign of wear or similar damage. Replace them in case of need.
4. Switch the system on and verify the following :
   a) The unit boots correctly without messages of error. The overlay graphics must be displayed in the right way on the monitor. All the probes are recognized in the right way.
   b) Perform a scan using an electronic transducer and look for a uniform, noise free image. Take any appropriate action to make the system operate properly
   c) Check the system time and date, and modify them, if necessary.
   d) Check the picture quality on the screen. In particular the picture must not present picture defects, distortions, unstableness, colors fault.
   e) Check the correct working of the keyboard's keys
   f) for the Biopsy (if present) the following verifications (that must be done immersing the probe in the water) are recommended after the biopsy kit and/or the probe have a mechanical shock and whenever the user considers it necessary for the patient's safety:
   - verify the needle-guide lies on the scan-plane of the probe verifying that the biopsy needle, inserted in the guide, is visible in the ultrasound image in the whole depth of the field of sight of the probe
   - verify that the position and the angle of insertion of the biopsy-needle correspond to the ones expected in the biopsy procedure
   g) Switch the system off. Remove the power supply cord.
5. Remove the plastic and the metallic panels and look for any dirty and dust ; if found , remove it.
6. Inspect all the cables (insertion , damages , scratches) ; clean the dust.
7. Extract all the PCBs and remove any dirty or dust. Look in the internal part of the metallic basket , and remove any dirty or dust. For the operation of removing and handling of the boards , it's necessary to follow all the precautions against electrostatic discharges (see chapter 10).
   For the PC UNIT remove the panels and clean carefully all the boards removing all the dust. Check all the connections and that the boards are properly placed. Check all the cables. If all is correct close the panels.
8. Insert again all the PCBs , paying attention that they must be properly seated and in the right place. Place also all the cables. Close the covers.
9. Open the keyboard zone and the Display group; check all the connections and remove any dirty or dust from connectors and boards.
10. Clean the trackball, and try to move it in order to be sure that it can slide freely.

11. Close the keyboard zone and the Display group.
12. Check the Mains Power, all the cables and the plugs. Remove any dirty or dust Verify the insulators on the plates. Verify the external fuses. Clean all the sockets.
13. Clean all around the system with a vacuum cleaner and in every place it's possible to access
14. If are present, remove all the installed peripherals and clean them; after connect the peripherals again. Check the cables of connection of the peripherals.
15. Remove any dirty or dust from all the transducers, check their cables (if they are damaged or scratched)
16. Check the connection of the video cable of the monitor.
17. Connect the power cord and switch the unit on. Check that it starts correctly.
18. Adjust the setting of the monitor according to the customer needs. Check all the parameters on the monitor
19. Check if all the transducers are ricognized in the right way, then perform some scans with each of them.
    Test the functioning modes enabled, using a phantom (if necessary and if available). Test all the peripherals, using each one of them.
    Correct any abnormal situation that comes out.
20. Switch the system off.
21. Discuss with the customer for any complain he may have, and do what it is possible to solve the referred problems. Take note of each complains, of each problem and of the consequent actions performed.

Note : for all these operations please refer to the chapters 2and 3 of this Service Manual.

MONITOR MAINTENANCE

Preventive Maintenance

Periodic maintenance provides significant contribution to ongoing reliability and performance of the monitor.
No calibration or electronic adjustments are required for the monitor.

The minimum frequency of PM inspection (Preventive Maintenance) is one per year.
Anyway it is recommended to perform a PM inspection:

- Periodically. This period may vary from 3 months to 6 months, depending upon the operating environment.
- Following a customer request.

The basic operations to test the correct functioning of the monitor are listed below:

- Interview the operator and discuss any problems that he may have with the monitor.
- Visually inspect the monitor for biohazard before doing anything to it. Take the necessary action if biohazard presence is suspected. If not sure, treat the monitor as infected.
- Clean or sanitize the monitor.
- Check the block of the maneuverability (handle in the right lateral part under the monitor)
- Check the vertical tilt maneuverability by rotating the monitor up and down vertically.
- Check the swivel maneuverability by rotating the monitor horizontally.
- Check the cable connection between the monitor and the main unit.
- Check the picture quality on the screen. In particular the picture must not present: picture defects, distortions, unstableness, and colors fault.

DO NOT ATTEMPT TO SERVICE OR OPEN THIS MONITOR YOURSELF - THERE IS NO USER SERVICEABLE PARTS INSIDE.

- Unplug the monitor from the power outlet and contact a qualified service person under the following circumstances:
  a) The monitor does not operate normally while following the operating instructions
  b) The monitor exhibits a distinct change in performance.

c) The monitor has been exposed to rain or water, or liquid has been spilled into the monitor.
d) The power plug or power switch and the signal cable are damaged.

Cleaning

Unplug the monitor from the power outlet before cleaning.

Screen

The monitor has an antistatic coating on the screen. Please clean the surface with care. Use a soft, clean cloth dampened with water or mild detergent for cleaning. If used a special screen cleaning tissue, check first that it is suitable for the antistatic coating. It does not destroy the coating but the tissue may leave the screen too glossy. Do not use any abrasives or hard objects to remove a stain. DO NOT polish the screen.

Cabinet

Use a cloth dampened with a mild detergent solvent.
Do not use strong solvents (i.e. acetone) because it may damage the surface of the cabinet.
Do not use aerosol cleaners.

MyLab Checklist

Customer:		**Date:**	
Address:		**UNIT s/n**	
		Monitor s/n	
Phone:		**Peripheral : s/n :**	
Notes:		**Peripheral : s/n :**	
		Peripheral : s/n :	
Signature:		**Peripheral : s/n :**	

Probes

Fill in this form while performing the Planned Maintenance procedure. Mark the appropriate box after each single check. When completed, please return it to the Service Department of the local ESAOTE Distributor.

INSTALLED OPTIONAL MODULES

EXTERNAL ASPECT

☐ Monitor ☐ Main unit
☐ Probes ☐ Peripherals

Eventual problems:

_____

_____

_____

CLEANING

☐ Internal PCBs ☐ Trackball and keyboard ☐ Monitor
☐ Transducers ☐ Covers ☐ Peripherals

Eventual problems:

_____

_____

_____

SYSTEM CHECKS

☐ AC power cords ☐ Connection cables for the peripherals
☐ Overlays ☐ Connection cables between PCBs
☐ Ecographic sector ☐ Image quality ☐ Monitor adjustments
☐ Footswitch ☐ Peripherals connection ☐ Peripherals working

Eventual problems:

_____

_____

_____

DISCUSSION WITH THE CUSTOMER - COMMENTS

_____

_____

_____

Chapter 10

Protection against electrostatic discharges

Opening and servicing **MyLab70** and **MyLab Gold Platform** (now indicated all as **MyLab**) it's necessary to keep attention to the electrostatic sensible devices. In the unit are contained several boards and single components that can be damaged with electrostatic discharges.

In the paragraph 10.1 are listed all the sensible parts. Handling them is necessary to follow all the precautions described in the following pages.

Both on the field and in a laboratory the operator that touch the parts must be protected against the electrostatic discharges , using a dedicated kit on the field (an example is shown in the paragraph 10.4) or preparing an E.P.A. in the laboratory (electrostatic protected area).

The tools used must be antistatic.

All the operation on the field must be done with unit switched off , with the power cable disconnected.

Where is necessary to check parts under voltage , the minimum value of resistance between the operator and ground must be $7.5 \times 10^5\ \Omega$, in order to avoid risks for the operator.

Sensibile devices on MyLab

As mentioned before, all the sensible devices on **MyLab** are identified with a special label placed on them.
Here below there is the list of all the sensible parts for each equipment:

MyLab70 code	MyLab Gold Platform code	Description	Notes
9501087100	9501087000	ICS (INPUT CONNECTOR SWITCH)	
9501090000	9501089000	ITR (INPUT TX-RX)	
	9501091000	ICC INPUT CW/CLOCK	
	9501092000	IMC (INPUT MASTER CONTROL)	
	9501093000	DIP (DIGITAL IMAGE PROCESSING)	
	9501095000	DEP (DIGITAL EXTENDED PROCESSING)	
	9501094000	DCP (DIGITAL COLOR PROCESSING)	
	9501097000	BSC (BACK SCAN CONVERTER)	
	9501099000	BLC (BACK LINK CONTROL)	
	9501100000	SPS (SWITCH POWER SUPPLY)	
9501102000	9501101000	SPR (SWITCH POWER REGULATOR)	
	9102572xxx	PC UNIT 61xx	Note * : with all the sub-parts that compose the whole code
	9501109000	PSE (PC SUPPLY ECG)	Inside the PC group 9102572000
	9501105000	PLC (PC LINK CONTROL)	Inside the PC group 9102572000
	9501110000	PVA (PC VIDEO ADAPTER)	Inside the PC group 9102572000
	9501172000	UHP (USB&HEADPHONES PANEL)	
9102706500	9102706000	DISPLAY GROUP 6100	Note * : with all the sub-parts that compose the whole code
9102639500	9102639000	WHOLE KEYBOARD 6100	Note * : with all the sub-parts that compose the whole code

How to prepare an Electrostatic Protected Area (E.P.A.)

Premise

The purpose of an E.P.A. is to preserve from possible electrostatic damages all the electronic devices with threshold superior of 100V.

Here below are listed some examples of E.S.D.S.(Electro-static devices sensible) :

Device	Minimum Threshold (V)
MOSFET	100
EPROM	100
JFET	140
OP. AMP.	190
CMOS	250

It's important to remind that the human body begins to be sensible at the electrostatic discharge when the value it's over 2000 V.

Everyone can damage an electronic device without notice.

It's possible to damage components even if are assembled on boards , for this reason is necessary to take care during all the phases like stoking , handling , reworking and installing boards.

To have an E.P.A. where is possible to work with sensible devices in a safe way , it's nowadays very important.

CHARACTERISTICS OF THE E.P.A.

To prepare an E.P.A. is possible without problem in every laboratory.

It's necessary to observe some little precautions :

-the E.P.A. must be delimited with dedicated plates .

-in the E.P.A. is forbidden :eating , drinking , smoking , changing clothes , using papers without antistatic shields, introducing material that generates electrostatic discharges (paper , plastic , nylon , adhesive tapes…)

All the under mentioned things must be antistatic :

-working surfaces (desks..)
-floors
-chairs
-clothes (surplices , shoes , glovers …..)
-tools
-reworking instruments (soldering stations…)
-envelopes where to stock boards (packaging…..)
-containers for electronic devices
-trolleys and envelopes for handling and carrying devices and boards

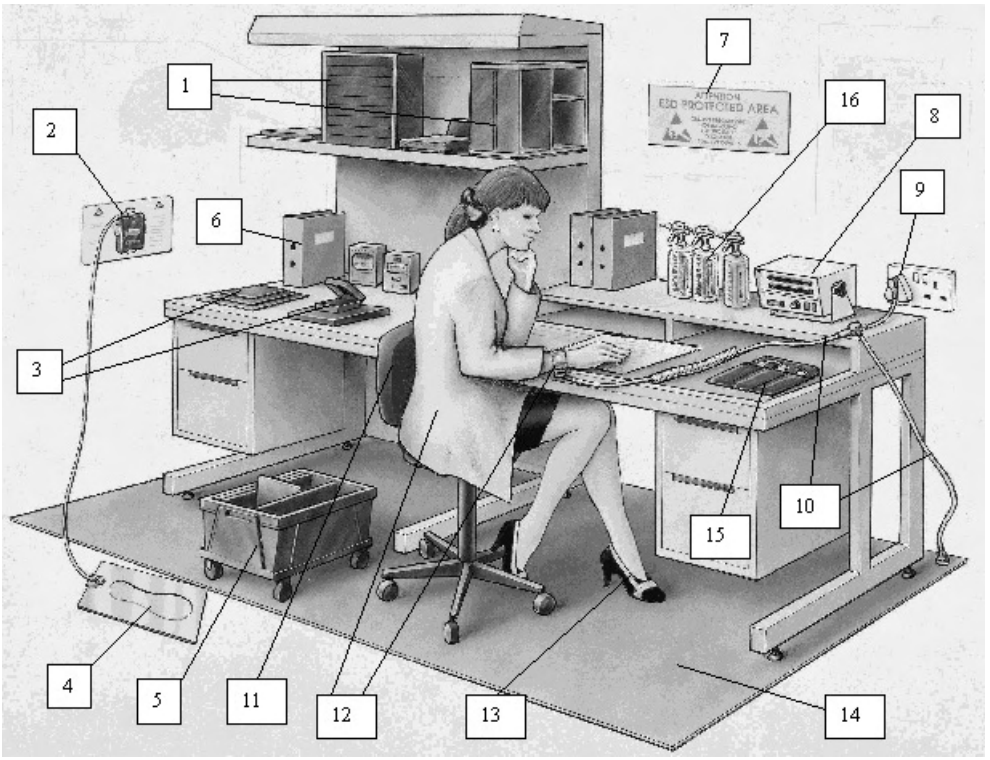


Figure 1.: an E.P.A. (Image given by catalogue "Ground Zero" for kindly license of OK International Spa).

LEGENDA :

1) Containers for boards and devices
2) Testing instrument for bracelet shoes and overshoes
3) Envelopes and packaging antistatic
4) Testing point for shoes and overshoes
5) Trolley to carry boards and devices
6) Holder for documents
7) Warning plates
8) Ionizator
9) Ground connection
10) Ground cables to connect operator and floor
11) Chair
12) Surplices and bracelet
13) Shoes or overshoes
14) Antistatic carpet for floor
15) Service kit with tools
16) Antistatic cleaner

Note :Also the soldering station must be connected to ground.

The Antistatic carpet (point 14) is used where no antistatic floor is present.

Is possible to put also an antistatic carpet on the table connected to the ground.

The values of resistance of the various items contained in the E.P.A. are :

Items	Surface Resistivity	Resistance to Ground
Working surfaces and floors	$<1x10^9$ Ohm/€	$<1x10^9$ Ohm
Trolleys to move sensible components	$<1x10^9$ ohm/€ working plane	$<1x10^{10}$ ohm (working plane) $<1x10^9$ ohm (chassis)
Surplices	$<1x10^{12}$ ohm/€	
Ground cables		$>9x10^5$ Ohm $<5x10^6$ Ohm
From hand with bracelet to end of the cable		$>9x10^5$ Ohm $<3.5x10^7$ Ohm
Shoes or overshoes		$>9x10^5$ Ohm $<3.5x10^7$ Ohm
Tools	Not fixed	$<1x10^{12}$ ohm
Chairs	Not fixed	$<1x10^9$ ohm

PRECAUTIONS FOR SERVICE OPERATION ON FIELD

Also in service operation is necessary take care against electrostatic discharges.

Particular service kits are reliable on market to protect the boards used.

In Figure 2 is shown a service kit .

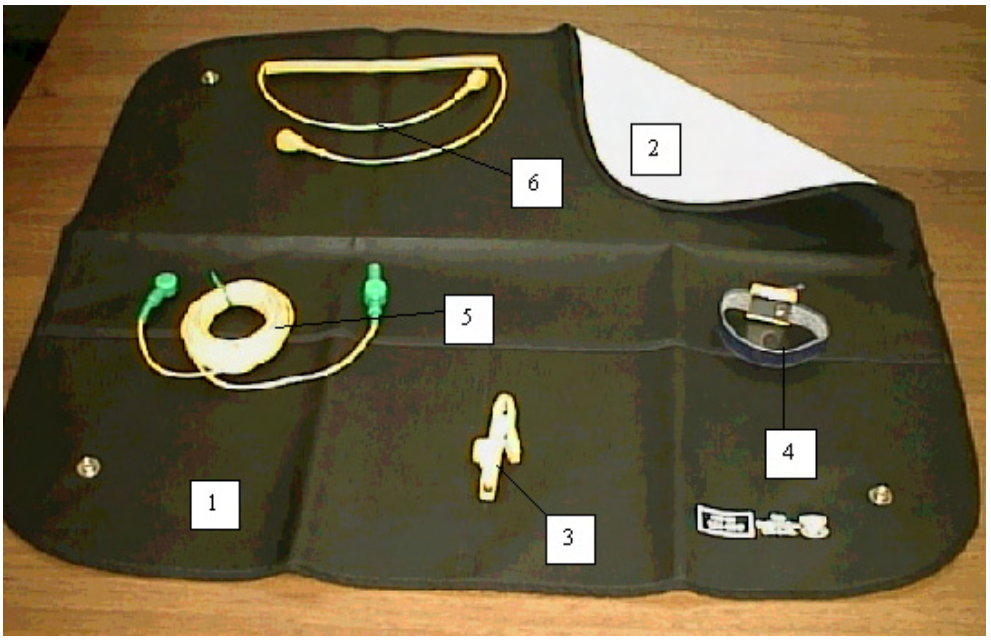


Figure 2.

LEGENDA :

1 :Conductive side of the mat
2 :Dissipative side of the mat
3 :Crocodile clip for each bonding to ground
4 :Bracelet for ground connection of the service operator
5 :Cable to connect mat to ground (by crocodile clip)
6 :Cable to connect mat to bracelet

HOW TO USE THE KIT

Connect the mat with cable 5 and crocodile 3 to a ground surface (e.g. chassis of the unit).

Connect one side of the cable 6 to the bracelet and the other side to the mat.

Wear the bracelet ; place the dissipative side of the mat on a safe surface then operate placing the boards in the conductive side.

Don't use the kit with parts under voltage.

Where is necessary to check parts under voltage , the minimum value of resistance between the operator and ground must be 7.5 x105 Ω , in order to avoid risks for the operator.

PRECAUTIONS TO SHIP AND STORE BOARDS

In all the boards , as mentioned before , there are several E.S.D.S. components.

For this reason particular precautions must be observed also storing and shipping boards:

all the boards must be inserted directly in shielding envelopes, carefully closed with antistatic tape. No paper must be inserted in the envelopes with the boards.

Don't place in shielding envelopes : batteries , charged capacitors and others sources of power to avoid short circuit.

Don't use envelopes scratched or broken.

Insert and remove the boards to and from the shielding envelopes only in E.P.A.

BIBLIOGRAPHY

All the data are taken for kindly authorisation of OK Industries Italy.

REF.: EN 100015 PT.1 (1992) ; IEC 1340-5-1 (1996)

Chapter 11

Software Installation

This chapter deals with the procedures that must be performed in order to install the various software on **MyLab70** and **MyLab Gold Platform** (now indicated all as **MyLab**) systems in the proper way.

In the table below there is the list of the SW releases and their code.

Release SW	MyLab70	MyLab Gold Platform
1.00	8610293000	8610294000
1.10	8610293001	8610294001

Installing 1.00 SW Release (EV1187)

Follow this procedure when any Software Release is not already installed on the system (i.e. after use of recovery disk).

1. At the startup press the <DEL> key to enter in the BIOS and check if the option **Hyper-Threading Technology** in the menu Advanced BIOS Features is disabled. In case disable it. Save the bios and reboot the system.

2. Log in the system as Administrator password laser.

3. When Windows XP start, press Cancel in order to ignore all the requests to install drivers that will appear.

4. Open **Control Panel → Display → Settings → Advanced → Adapter → Properties → Driver** and check the information about the driver ATI Catalyst 5.8 for the video board ATI RADEON 9600 SE. If they are:
   - Driver Date: 8/3/2005
   - Driver Version: 8.162.0.0

   the system doesn't require any update, otherwise follow the procedure described in the paragraph "Updating drivers for ATI RADEON 9600 SE Video Board".

5. Check the monitor resolution and frequency. Open **Control Panel → Display → Settings**, Screen Resolution must be **1024 x 768** and Color quality **32 bit**, press **Advanced → Monitor**, Screen refresh rate must be **60 Hz**.

6. Open **Control Panel → System → Hardware → Device Manager** click on "**Sound, video and game controllers**" and check if **Hauppage WinTV 878/9 WDM Video Driver** is present. If not uninstall the old driver launching **hcwclear.exe** in the folder **Service\Drivers\Grabber\Hauppage WinTv** and choosing the complete uninstallation; at the end reboot the system. When the system restarts ignore all the requests to install drivers that will appears and launch **wdm346_23061.exe** in the folder **Service\Drivers\Grabber\Hauppage WinTv**. Reboot the system and when the system restarts accept the automatic installation of the detected Hauppage peripherals.

7. Install the version of Nero Burning Rom enclosed with the CD/DVD recorder.
   MyLab70: insert the CD enclosed with the CD recorder, if autorun start close it. Explore the CD searching the folder \CDS\Nero and run the setup. Confirm all the options.
   MyLabGold Platform: insert the CD enclosed with the combo drive, wait for autorun, choose Nero, accept the license Agreement and confirm all the option, at the end of installation press Finish.
   At the end run the program DMA Manager of Nero and check if the DMA access is enabled for all the CD/DVD drives installed in the system. If case enable the DMA access.

8. Install the SW **Biolab** by running **Install6100.exe** contained in the folder **Biolab_tools\Biolab**. Wait till the installation DOS window is closed.

9. Install Adobe SVG Viewer 6.0 running **SVGViewLast6.0** in the folder **Biolab_tools\SVG**. At the end double click on **BARGRAPH_1.svg** in the same folder and accept the license agreement.

10. Install the program for the login management running **Esaote.Gina.Setup.msi** in the folder **Biolab_tools\GINA**. After the installation, insert the service USB key in the first of the USB ports in the front side. Wait till the system recognize the key, refuse the research on internet and accept the automatic installation. Wait for the installation of the driver. Extract the key and insert it in the second USB port and repeat the previous steps

11. Copy the **Usdata** folder from the installation disk to C:.

12. Install the **Echos** SW running **SetupEchos.msi** present in the folder **Echosbin**. Confirm all the default options and when appear the "Hardware Installation" windows related to the "Cygnal USB composite" and CP2101 USB to UART Bridge Controller" click on "Continue anyway". Wait the end of the installation and reboot the system with the service key inserted.

13. Install **Microsoft MPEG-4 Video Codec** running **wmpcdcs8.exe** in the folder **Biolab_tools\Codec**. Click YES to accept the installation and to accept the License Agreement, then click Next to all the requests and accept to update only the newest components. Wait for the end of installation and reboot the system if required.

Installing 1.10 SW Release (EV1242)

Follow this procedure when any Software Release is not already installed on the system (i.e. after use of recovery disk).

1. At the startup press the <DEL> key to enter in the BIOS and check if the option Hyper-Threading Technology in the menu Advanced BIOS Features is disabled. In case disable it. Save the bios and reboot the system.

2. Log in the system as Administrator password laser

3. When Windows XP start, pres Cancel in order to ignore all the requests to install drivers that will appear.

4. Open **Control Panel → Display → Settings → Advanced → Adapter → Properties → Driver** and check the information about the driver ATI Catalyst 5.8 for the video board ATI RADEON 9600 SE. If they are:
   - Driver Date: 8/3/2005
   - Driver Version: 8.162.0.0
   the system doesn't require any update, otherwise follow the procedure described in the paragraph "Updating drivers for ATI RADEON 9600 SE Video Board".

5. Check the monitor resolution and frequency. Open **Control Panel → Display → Settings**, Screen Resolution must be **1024 x 768** and Color quality **32 bit**, press **Advanced → Monitor**, Screen refresh rate must be **60 Hz**.

6. Open **Control Panel → System → Hardware → Device Manager** click on "**Sound, video and game controllers**" and check if **Hauppage WinTV 878/9 WDM Video Driver** is present. If not uninstall the old driver launching **hcwclear.exe** in the folder **Service\Drivers\Grabber\Hauppage WinTv** and choosing the complete uninstallation; at the end reboot the system. When the system restarts ignore all the requests to install drivers that will appears and launch **wdm346_23061.exe** in the folder **Service\Drivers\Grabber\Hauppage WinTv**. Reboot the system and when the system restarts accept the automatic installation of the detected Hauppage peripherals.

7. Install the version of Nero Burning Rom enclosed with the CD/DVD recorder.
   MyLab70: insert the CD enclosed with the CD recorder, if autorun start close it. Explore the CD searching the folder \CDS\Nero and run the setup. Confirm all the options.
   MyLab Gold Platform: insert the CD enclosed with the combo drive, wait for autorun, choose Nero, accept the license Agreement and confirm all the option, at the end of installation press Finish.
   At the end run the program DMA Manager of Nero and check if the DMA access is enabled for all the CD/DVD drives installed in the system. If case enable the DMA access.

8. Install the program for the login management running **Esaote.Gina.Setup.msi** in the folder **Biolab_tools\GINA**. Insert the service USB key in the first of the USB ports in the front side. Wait till the system recognize the key, refuse the research on internet and accept the automatic installation. Wait for the installation of the driver. Extract the key and insert it in the second USB port and repeat the previous steps.

9. Run **setup.bat** in the root of installation disk.
   Master Setup will start checking the integrity of the files in the installation disk. It take few minutes. At the end the system automatically reboot. The uninstallation of the old software and the installation of the new one start. When SVG Software require the installation, click YES and accept the Software License Agreement; close the window of internet explorer when requested. The installation continues: confirm all the default options and when appear the "Hardware Installation" windows related to the "Cygnal USB composite" and CP2101 USB to UART Bridge Controller" click on "Continue anyway". At the end of the installation the system automatically reboots. The installation continues, choose OK when the message "Setup require the last reboot. Please remove the USB key and click OK". When the system reboots, the FW is updated and at the end the MyLab Software starts.

In case of errors try the MANUAL PROCEDURE:

10. Install the SW **Biolab** by running **Install6100.exe** contained in the folder **Biolab_tools\Biolab**. Wait till the installation DOS window is closed.

11. Install Adobe SVG Viewer 6.0 running **SVGViewLast6.0** in the folder **Biolab_tools\SVG**. At the end double click on **BARGRAPH_1.svg** in the same folder and accept the license agreement.

12. Install the program for the login management running **Esaote.Gina.Setup.msi** in the folder **Biolab_tools\GINA**. After the installation, insert the service USB key in the first of the USB ports in the front side. Wait till the system recognize the key, refuse the research on internet and accept the automatic installation. Wait for the installation of the driver. Extract the key and insert it in the second USB port and repeat the previous steps.

13. Copy the **Usdata** folder from the installation disk to C:.

14. Install the **Echos** SW running **SetupEchos.msi** present in the folder **Echosbin**. Confirm all the default options and when appear the "Hardware Installation" windows related to the "Cygnal USB composite" and CP2101 USB to UART Bridge Controller" click on "Continue anyway". Wait the end of the installation and reboot the system with the service key inserted.

15. Install **Microsoft MPEG-4 Video Codec** running **wmpcdcs8.exe** in the folder **Biolab_tools\Codec**. Click YES to accept the installation and to accept the License Agreement, then click Next to all the requests and accept to update only the newest components. Wait for the end of installation and reboot the system if required.

Updating to 1.10 SW Release (EV1242)

This procedure can be used in order to update from SW Release 1.00 to 1.10.

1. At the startup press the <DEL> key to enter in the BIOS and check if the option Hyper-Threading Technology in the menu Advanced BIOS Features is disabled. In case disable it. Save the bios and reboot the system with the service key inserted.
2. Open **Control Panel → Display → Settings → Advanced → Adapter → Properties → Driver** and check the information about the driver ATI Catalyst 5.8 for the video board ATI RADEON 9600 SE. If they are:
   - Driver Date: 8/3/2005
   - Driver Version: 8.162.0.0

   the system doesn't require any update, otherwise follow the procedure described in the paragraph "Updating drivers for ATI RADEON 9600 SE Video Board".
3. Check the monitor resolution and frequency. Open **Control Panel → Display → Settings**, Screen Resolution must be **1024 x 768** and Color quality **32 bit**, press **Advanced → Monitor**, Screen refresh rate must be **60 Hz**.
4. Open **Control Panel → System → Hardware → Device Manager** click on "**Sound, video and game controllers**" and check if **Hauppage WinTV 878/9 WDM Video Driver** is present. If not uninstall the old driver launching **hcwclear.exe** in the folder **Service\Drivers\Grabber\Hauppage WinTv** and choosing the complete uninstallation; at the end reboot the system. When the system restarts ignore all the requests to install drivers that will appears and launch **wdm346_23061.exe** in the folder **Service\Drivers\Grabber\ Hauppage WinTv**. Reboot the system and when the system restart accept the automatic installation of the detected Hauppage peripherals.
5. Run **setup.bat** in the root of installation disk.
   Master Setup will start checking the integrity of the files in the installation disk. It take few minutes. At the end the system automatically reboot. The uninstallation of the old software and the installation of the new one start. When SVG Software require the installation, click YES and accept the Software License Agreement; close the window of internet explorer when requested. The installation continues: confirm all the default options and when appear the "Hardware Installation" windows related to the "Cygnal USB composite" and CP2101 USB to UART Bridge Controller" click on "Continue anyway". At the end of the installation the system automatically reboots. The installation continues, choose OK when the message "Setup require the last reboot. Please remove the USB key and click OK". When the system reboots, the FW is updated and at the end the MyLab Software starts.

Updating driver for ATI RADEON 9600 SE Video Board

1. Uninstall the old drivers running **cat-uninstaller.exe** in the folder **Service\Drivers\VGA\RADEON9600_V5_8**. Continue till the request of removing, choose Remove, then click Next and REMOVE. Wait for the end of uninstallation and reboot the system.

2. Install the new driver. During this phase the graphic resolution is very low, do not mind it. Run **5-8_xp-2k_dd_ccc_wdm_enu_25203.exe** in the folder **Service\Drivers\VGA\RADEON9600_V5_8**. If "Security Warning" appears click RUN. Accept the default installation folder, accept the License Agreement and choose Express. Reboot the system and when "ATI Registration Choice" window appears choose Never remind me and click OK..

Updating to 1.10 SW Release (EV1242) from a lab version.

Follow this procedure if you want to save the archive.

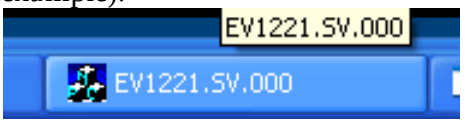
When you are updating from a laboratory version to an official software release it is necessary follow this procedure to avoid the deletion of the archive.

If you are updating from 1.00 SW release or you do not want to save the archive follow the procedure "Updating to 1.10 SW Release (EV1242)".

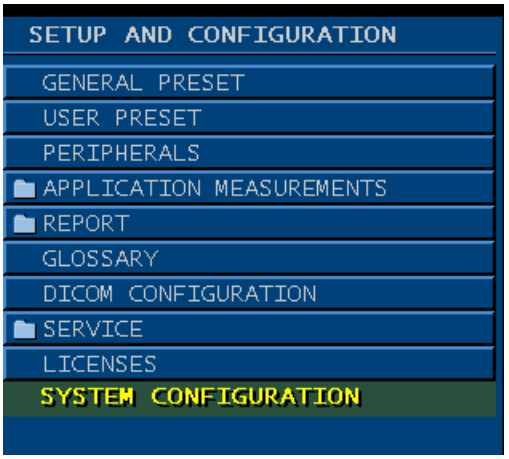
In order to update to an official SW Release starting from an installed laboratory version, first of all it is necessary understand the installed system version.

How to know the installed system version

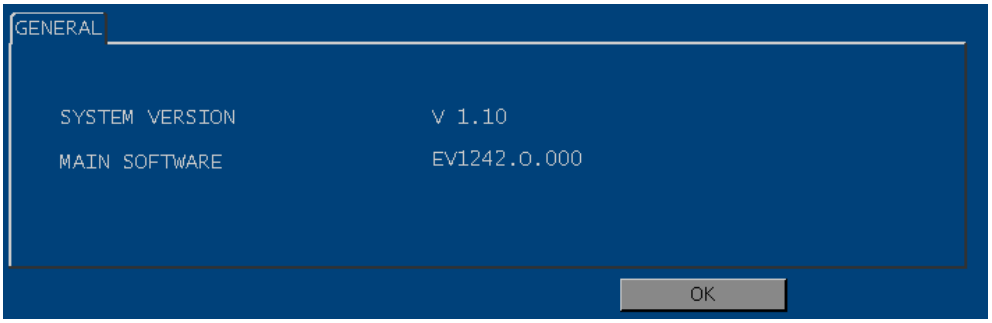
1. Switch MyLab on with the service key inserted.
2. Wait till Windows XP starts
3. Run MyLab software double clicking on the "Start" icon on the desktop
4. When the probe selection mask appear, press CTRL+ESC to show the Windows taskbar
5. The title of the GWL program show the MyLab system version installed (EV1221 in the example).



Starting from the 1.10 SW release it is possible to know the installed system version clicking on “System configuration” in the main menu.



The following window will appears:



The table below lists the SW version and the procedure to follow in order to upgrade it.

SW code	Procedure
Till to EV0944 (LAB18)	Go to “Recovery procedure”
From EV0956 (LAB19)	Follow this procedure
EV1187 (1.00)	Go to “Updating to 1.10 SW Release”

1. At the startup press the <DEL> key to enter in the BIOS and check if the option **Hyper-Threading Technology** in the menu Advanced BIOS Features is disabled. In case disable it. Save the bios and reboot the system with the service key inserted.

2. Open **Control Panel → Display → Settings → Advanced → Adapter → Properties → Driver** and check the information about the driver ATI Catalyst 5.8 for the video board ATI RADEON 9600 SE. If they are:
   - Driver Date: 8/3/2005
   - Driver Version: 8.162.0.0

   the system doesn't require any update, otherwise follow the procedure described in the paragraph "Updating drivers for ATI RADEON 9600 SE Video Board".

3. Check the monitor resolution and frequency. Open **Control Panel → Display → Settings**, Screen Resolution must be **1024 x 768** and Color quality **32 bit**, press **Advanced → Monitor**, Screen refresh rate must be **60 Hz**.

4. Open **Control Panel → System → Hardware → Device Manager** click on "**Sound, video and game controllers**" and check if **Hauppage WinTV 878/9 WDM Video Driver** is present. If not uninstall the old driver launching **hcwclear.exe** in the folder **Service\Drivers\Grabber\Hauppage WinTv** and choosing the complete uninstallation; at the end reboot the system. When the system restarts ignore all the requests to install drivers that will appears and launch **wdm346_23061.exe** in the folder **Service\Drivers\Grabber\Hauppage WinTv**. Reboot the system and when the system restart accept the automatic installation of the detected Hauppage peripherals.

5. Backup the archive
   From EV0956 to EV1047: Move the folder **C:\Biolab\Archive** in **C:\Temp**
   From EV1080: start MyLab SW and **Backup** the archive in the **C:\Temp\BackupBiolab** folder (create it if not exist) using the **BACKUP ARCHIVE** command that appears clicking **UNDO** on the Hard Disk icon in Archive Review. Select all the exams and choose the destination folder by clicking the **DESTINATION** key and click **OK** to confirm. Run the backup clicking **START** and wait till it is finished, then click **CLOSE** to go back to **Archive Review**.

6. Reboot the unit with the service key inserted.

7. Install the SW **Biolab** by running **Install6100.exe** contained in the folder **Biolab_tools\Biolab**. Wait till the installation DOS window is closed.

8. If you like to remove any enabled trace, delete the folder **C:\DbgTrace**

9. Uninstall the Echos SW. Open **Control Panel → Add or remove Programs** and require the **Setup Echos** uninstallation.

10. Open **Control Panel → Add or remove Programs** and check if **Adobe SVG Viewer 6.0** is present. If not install it running **SVGViewLast6.0** in the folder **Biolab_tools\SVG**. At the end double click on **BARGRAPH_1.svg** in the same folder and accept the license agreement.

11. Delete the old **Usdata** folder and copy the new one contained in the installation disk.

12. Install the **Echos** SW running **SetupEchos.msi** present in the folder **Echosbin**. Confirm all the default options and when appear the "Hardware Installation" windows related to the "Cygnal USB composite" and CP2101 USB to UART Bridge Controller" click on "Continue anyway". Wait the end of the installation and reboot the system with the service key inserted.

13. Open **Control Panel → System → Hardware → Device Manager** select **Sound, video and game controllers → Video codecs** double click, select the **Properties** tab and check **if Microsoft MPEG-4 Video Codec** is present. If not install it running **wmpcdcs8.exe** in the folder **Biolab_tools\Codec**. Click **YES** to accept the installation and to accept the License Agreement, then click **Next** to all the requests. Wait for the end of installation and reboot the system if required.

14. Restore the archive
    From EV0956 to EV1047: Move the folder **C:\Temp\Archive** in **C:\BiolabWork**
    From EV1080: start MyLab SW and **Restore** the archive from the **C:\Temp\BackupBiolab** folder using the **RESTORE ARCHIVE** command that appears clicking **UNDO** on the Hard Disk icon in Archive Review. Click the **SOURCE** key, select the source folder and click **OK** to confirm. Run the restore clicking **START** and wait till it is finished, then click **CLOSE** to go back to **Archive Review**.

Recovery procedure

A dedicated kit has been introduced, with the purpose to restore the original conditions in the **MyLab**, after a defect in the HDD, or the replacement of this part or the PC group with another with different characteristics (for all the mentioned operations please refer to the right service manuals).

The code of the recovery DVD is 8610290000 Rev. A.

It's important to underline that the DVD code 8610290000 is only a backup of Window XP, in order to reinstall it, the original data and drivers correlated.

Applying this procedure all the existing data will be overwritten (archives of images, settings, drivers…), and will be impossible to save them after.

To install **MyLab** software version and all the other software will be necessary to use the software pack.

If will be installed a different release from the original one, it's possible that the unit won't work correctly.

If there is the necessity to perform one upgrade, before proceed with it, please refer to the Technical Notes in order to perform all the necessary preliminary operations.

PRELIMINARY OPERATIONS

The first step to perform is to modify the BIOS, in order to boot directly with the DVD.

According the type of board installed there are different steps to perform. It's possible to recognize the motherboard looking at the code written in the internal label positioned on the PC Group:

-Motherboard FOXCONN (code 9102586000 IC=0 and 9102572000/100 IC=0)

1. Turn the unit on and keep pressed the <DEL> key to enter in the BIOS
2. In case the unit requests a password write "laser"
3. In the main page using the arrows move to select the voice "Advanced BIOS Features" and press <Enter>
4. Move to the voice "First Boot Device" and push <Enter>

5. In the menu which will appear select the voice “CDROM” and press <Enter>

6. Insert the recovery DVD code 8610290000 in the drive

7. Press <F10> to leave the BIOS and save the setup answering “Y” at the question that will appear; push <Enter>; the system will reboot automatically

-Motherboard ASUS (code 9102572000/100 IC=1)

1. Turn the unit on and keep pressed the <DEL> key to enter in the BIOS

2. In case the unit requests a password write “laser”

3. In the page “MAIN” using the arrows move to select the voice “IDE configuration” and press <Enter>

4. Move to the voice “Onboard IDE Operate Mode” and push <Enter>

5. Move to the voice “Compatible mode” and push <Enter>

6. Move to the voice “IDE Ports settings” and push <Enter>

7. Move to the voice “Secondary P-ATA + S-ATA” and push <Enter> (in the case the PC group has the DVD drive in the primary IDE channel it’s necessary to select the “Primary P-ATA + S-ATA”)

8. Press <ESC> and using the arrows move to the menu “Boot” and select the voice “Boot Device Priority” and push <Enter>

9. Select the voice “1st boot device” and push <Enter>

10. Move to the description corresponding to the DVD and push <Enter>

11. Insert the recovery DVD code 8610290000 in the drive

12. Press <F10> to leave the BIOS and save the setup moving to the voice “OK” of the menu that will appear; push <Enter>; the system will reboot automatically

OPERATIONS WITH THE RESTORE DVD

The DVD 8610290000 is a bootstrap DVD, so inside there are all the files necessary to start automatically.

At the reboot, after the modification of the BIOS parameters, the DVD will start the recovery procedure.

It will appear the following menu:

```
**************************************************
**********        ESAOTE S.p.A.          ***********
**********  HDD Recovery Tool for 61XX   ***********
**********     861 0290 000 Rev. A       ***********
**************************************************

Press "1" for PC type A
Press "2" for PC type B
Press "3" for PC type C
Press "4" to exit
```

According the type of PC group inside the system, it will be necessary to select the recovery option.

The table below summarize the various options:

Number	Used in units…
1	Motherboard FOXCONN code 9102586000 IC=0
2	Motherboard FOXCONN code 9102572000/100 IC=0
3	Motherboard ASUS code 9102572000/100 IC=1

Pushing one of the numbers the system will start automatically to erase the HDD and to reinstall all the XP software. This operation will take some minutes.

At the end of the procedure will appear the following message.

```
**************************************************
***********  Remove any CD from drives   ***********
***********            and               ***********
***********  reboot your computer now    ***********
**************************************************

R:\>
```

Remove the recovery DVD from the drive and reboot the unit pressing <CTRL> <ALT> <DEL>.

RESTORE OF THE BIOS SETUP

As soon as the system restarts push the <DEL> key to restore the BIOS setup.

-Motherboard FOXCONN (code 9102586000 IC=0 and 9102572000/100 IC=0)

1. In case the unit requests a password write “laser”
2. In the main page using the arrows move to select the voice “Advanced BIOS Features” and press <Enter>
3. Move to the voice “First Boot Device” and push <Enter>
4. In the menu which will appear select the voice “Hard Disk” and push <Enter>
5. Press <F10> to leave the BIOS and save the setup answering “Y” at the question that will appear; push <Enter>; the system will reboot automatically

-Motherboard ASUS (code 9102572000/100 IC=1)

1. In case the unit requests a password write “laser”
2. In the page “MAIN” move with the arrows to select the voice “IDE configuration” and press <Enter>
3. Move to the voice “Onboard IDE Operate Mode” and push <Enter>
4. Move to the voice “Enhanced mode” and push <Enter>
5. Move to the voice “Enhanced mode support On” and push <Enter>
6. Move to the voice “P-ATA + S-ATA” and push <Enter>
7. Press <ESC> and using the arrows move to the menu “Boot” and select the voice “Boot Device Priority” and push <Enter>
8. Select the voice “1st boot device” and push <Enter>
9. Move to the description corresponding to the Hard Disk and push <Enter>
10. Press <F10> to leave the BIOS and save the setup moving to the voice “OK” of the menu that will appear; push <Enter>; the system will reboot automatically

WINDOWS XP SETUP

When the unit will reboot will start the setup of the main SW.

1. In the page “Welcome to Microsoft Windows” select the icon “Next” (in the lower right side)

2. In the page “What time zone are you in?” select the right time zone and check the checkbox for the voice “Automatically adjust clock for daylight saving time”; after press “Next”

3. In the page “The End User License Agreement” select the voice “Yes, I accept” and click “Next”

4. In the page “Help protect your PC” select the voice “Not right now”, then “Next”

5. In the page “What’s your computer’s name?” set the unit name (the factory default is <unit name>_<s/n unit> i.e. 6100 for MyLab Gold Platform and 6150 for MyLab 70, i.e. 6150_0065), leave the field “Computer description” empty, then “Next”

6. In the page “What’s your Administrator password?” set the password “laser” and click “Next”

7. In the page “Is this computer in a domain?” select “No, don’t make this computer part of a domain” then “Next

8. In the page “How will this computer connect to the Internet?” select “Skip” and do not set any value

9. In the page “Ready to register with Microsoft?” select the voice “No, not at this time”, then “Next”

10. In the page “Who will use this computer?” set in the field “Your name” the name “Esaote”, then “Next”

11. In the page “Thank you!” click on “Finish”, Windows will reboot.

12. In the page of login of Windows press two times the keys <Ctrl><Alt><Del>, in the menu that will appear set the User Name as “Administrator” with the password “laser” and click on the key “OK”

13. If it will appear the message “Your password expires today. Do you want to change it now? “ select “NO”

14. Push the key “Cancel” in all the menu “Found New Hardware Wizard” that will appear

15. In the menu “Start” select the voice “Settings” and then “Control Panel” and double click on the icon “Administrative Tools” and then “Computer Management”

16. In the menu in the left part select the voice “Local Users and Groups” and in the right part double click on “Users”

17. In the right part go to the voice “Esaote” and open the menu with a click on the right key of the system, select “Delete” and click the key “Yes” in the menu that will appear

18. Always in the right menu select the voice “Administrator” and open the menu with a click on the right key of the system and select “Properties”

19. In the menu that will appear disable the voice “User must change password at next logon” and enable the voice “Password never expires”, press the key “apply” and then “OK” Close all the menu and reboot the unit.

MYLAB SW SETUP

Follow the Software Pack Installation Procedure in order to install the **MyLab** Software according the SW release you want install.

Chapter 12

DICOM Connection

DICOM (Digital Imaging and Communications in Medicine) is a standard (that is, a set of rules) for medical images and information exchange between different devices (computers, medical system, etc). DICOM's basic features are listed below:

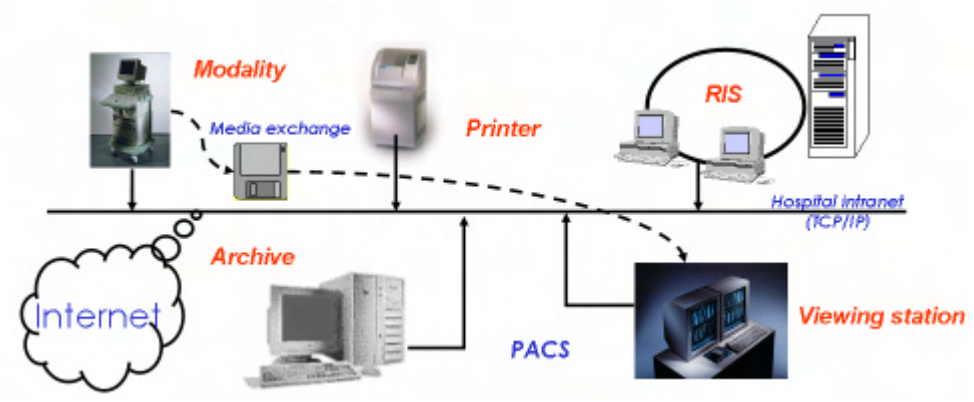
- It encloses a communication protocol with detail specifications about image and information transfer
- It defines an "open system" context allowing the connectivity among different manufacturers.
- It's based on standard computer network technologies and protocols (Ethernet, TCP/IP, removable media like CD-R and USB Pen drives).

The standard is used and supported because:

- DICOM is the only Medical Imaging and Communications Standard accepted worldwide.
- DICOM is used for image transfer and archiving, search and retrieve from archiving systems and net printing in thousands network system installations.
- DICOM is having an increasing integration with RIS/HIS (Radiology/Hospital Information System).
- DICOM evolves in function of real needs.

Brief description of a DICOM network

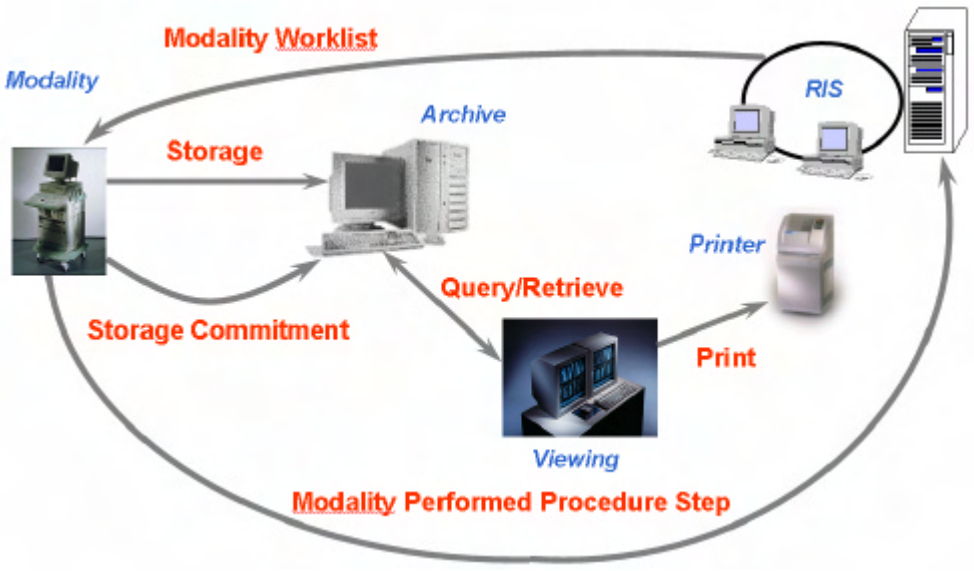
A scheme of typical and complete structure of a network installation is shown in the following picture.



The DICOM standard (Digital Imaging and Communications in Medicine) establishes, through the network (Intranet/Internet) or removable media exchange, a common language among:

- modalities (US, MR, CT, CR, etc.),
- medical printers (laser cameras),
- PACS (Picture Archiving and Communication Systems: archive, viewing stations),
- medical post-process workstations (for MPR, therapy planning, surgical navigation, etc.),
- Information systems: HIS/RIS (Hospital/Radiology Information System).

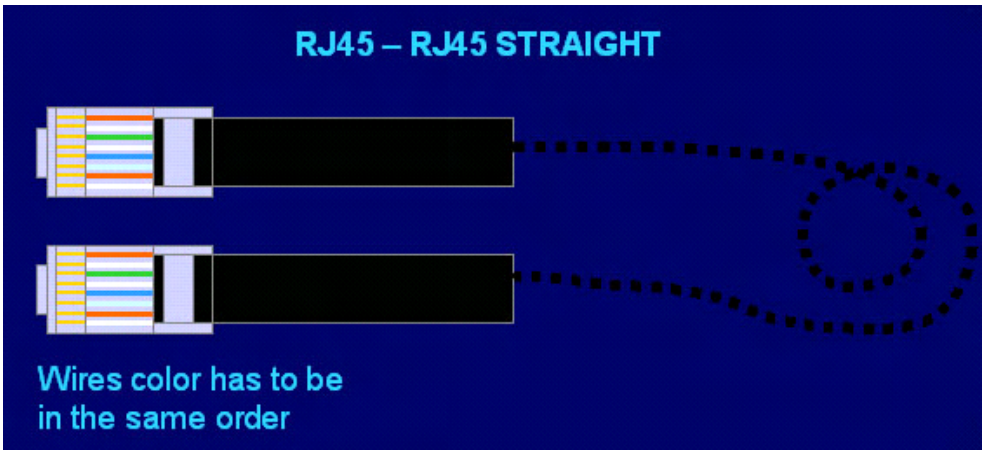
DICOM most used services are showed in next image:



Network installation

In order to connect a system to an existing Ethernet 10-Base T or 100-Base T network (i.e. in a hospital) cable is required.

A UTP Cable (CAT-5) is needed. This cable also called “patch cable” has RJ45 connectors on both sides. Normally when connecting to the wall network plug, you should use a straight cable (see next figure).



The network plug on **MyLab** is on the rear panel of the system.

Once the hardware connection has been performed, the TCP/IP protocol of the system should be configured.

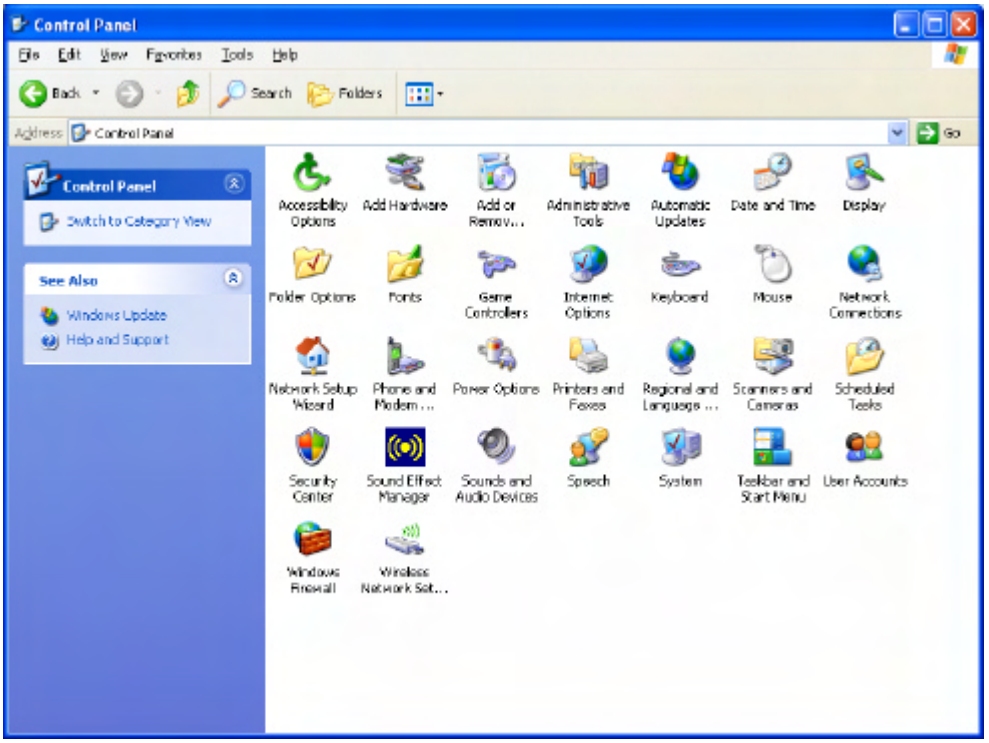
Network configuration

The Service key is required

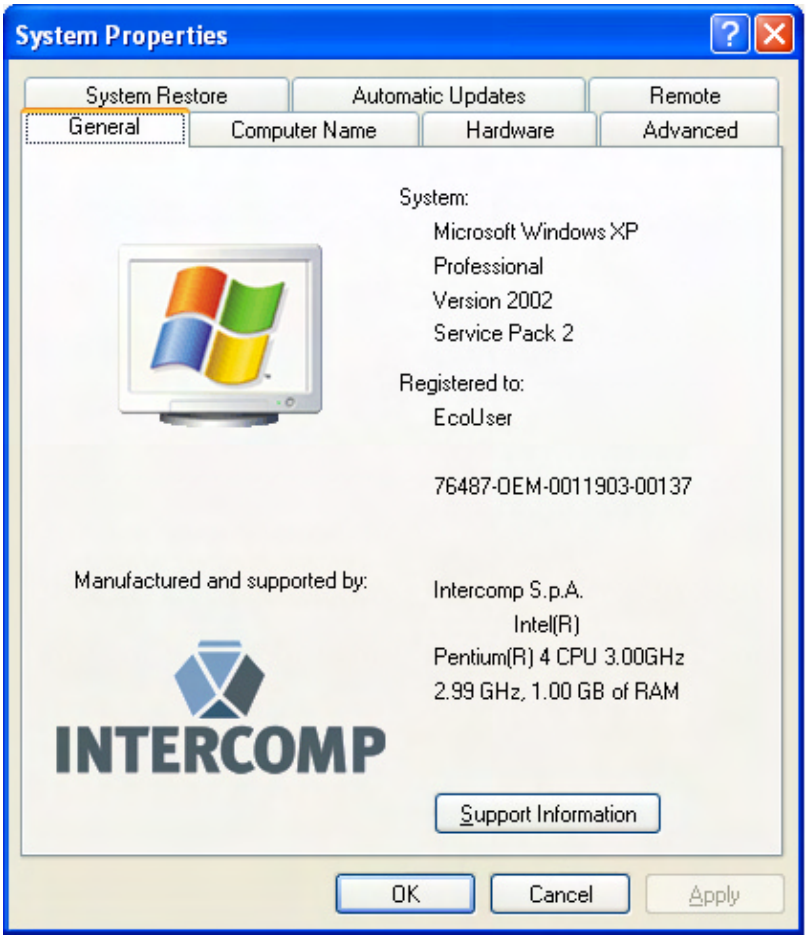
This procedure can be activated only if the Service key is inserted before switching on the unit.

1. Switch on the unit.

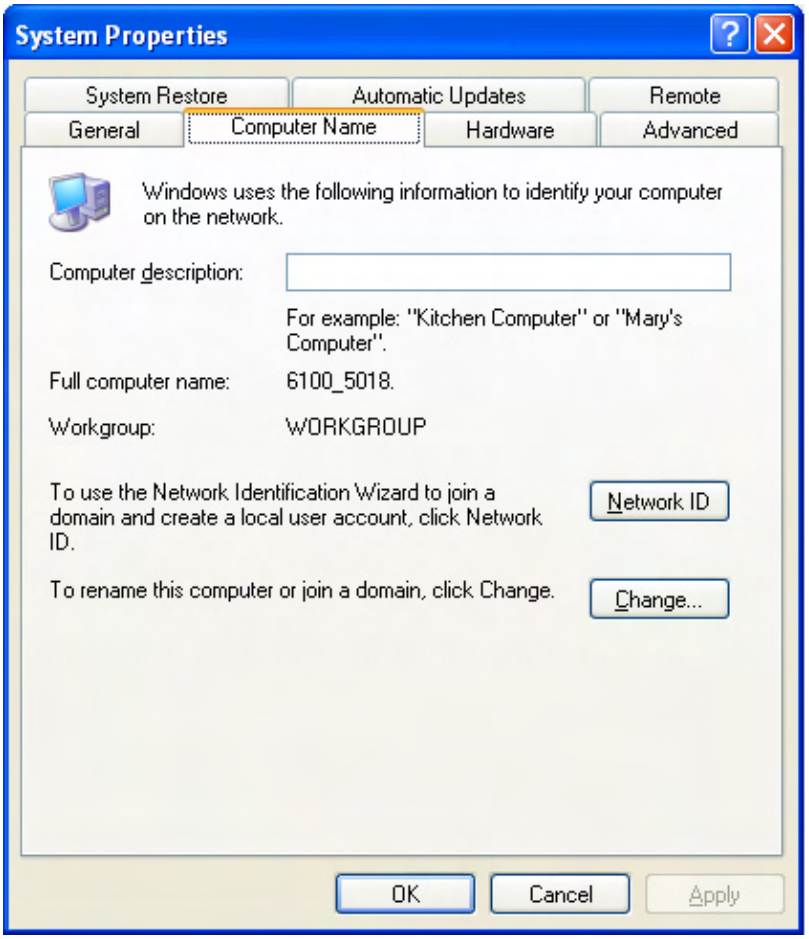
2. Press the Start key, highlight the Settings option and select Control Panel.



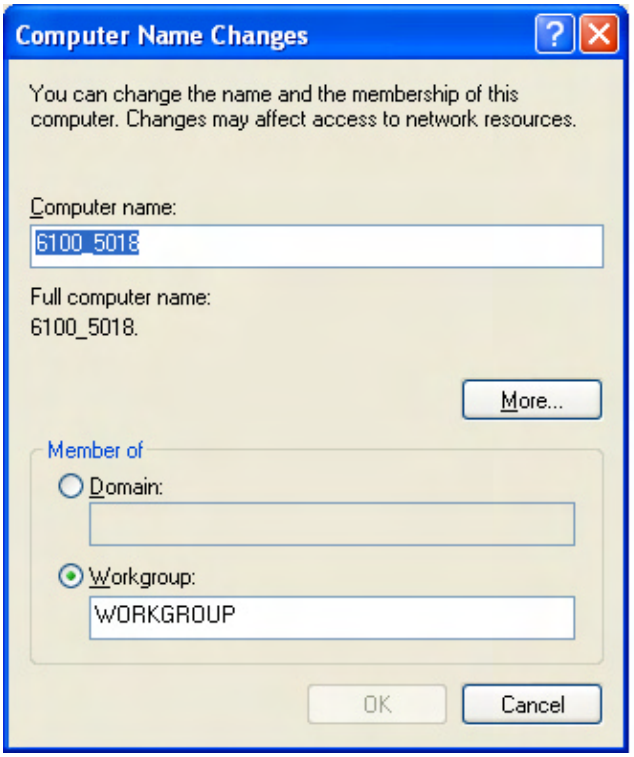
3. Double click the System icon; will appear the following window.



4. Open the tab Computer Name



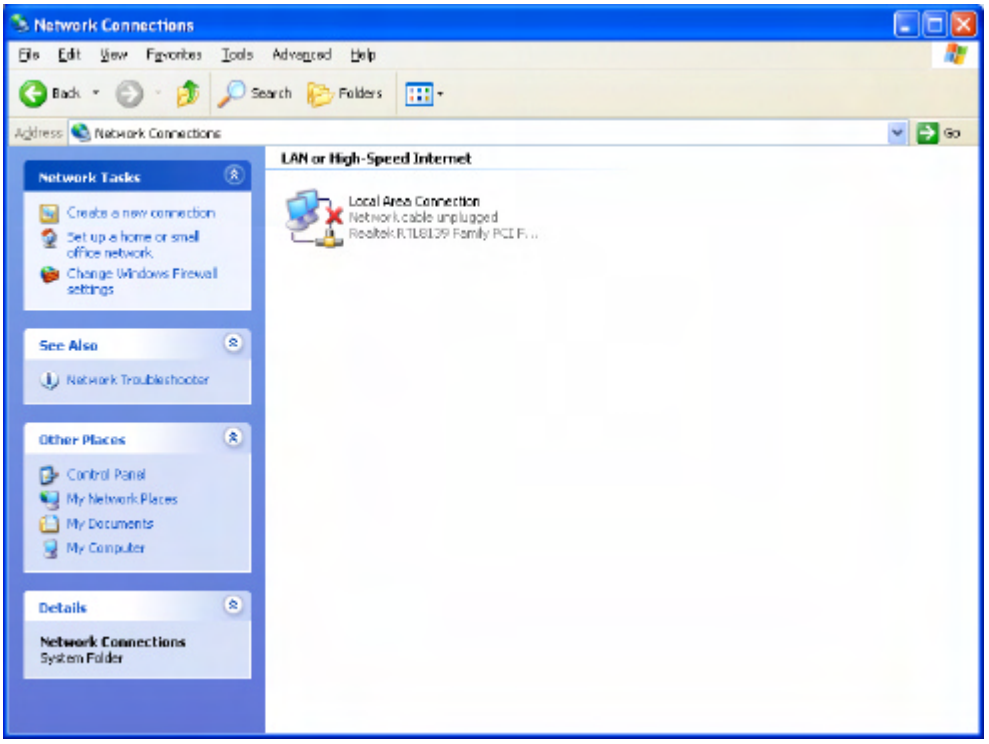
5. Press the Change key in order to set the system working in a Workgroup or a Domain (anyway this information has to be provided from the network administrator).
   NOTE: do not change the Computer Name.



6. Press OK to confirm

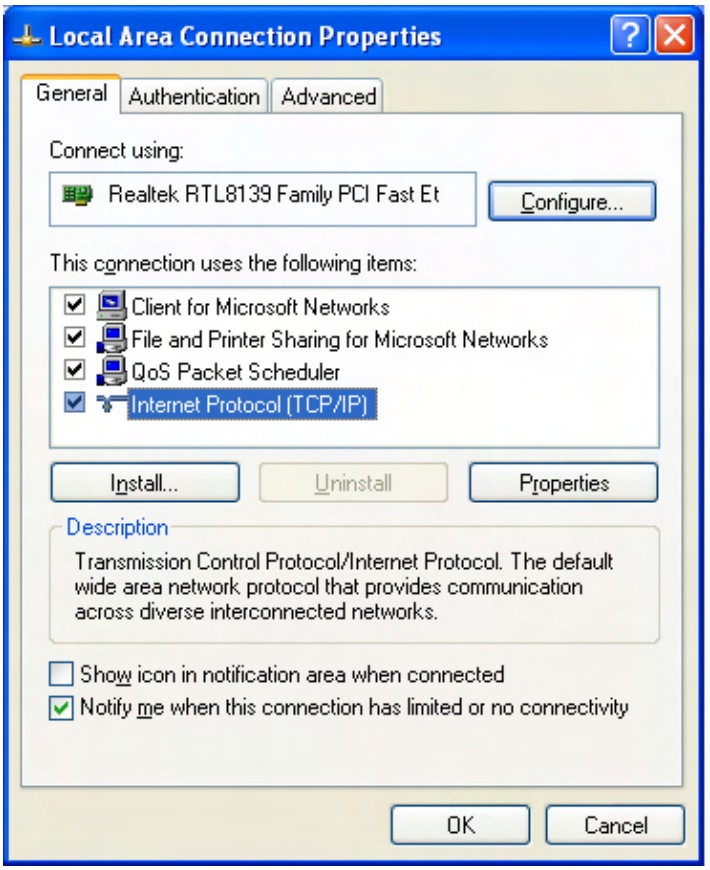
7. Press OK to close the System Properties windows

8. In the Control Panel double click on the Network Connection icon; will appear the following window.

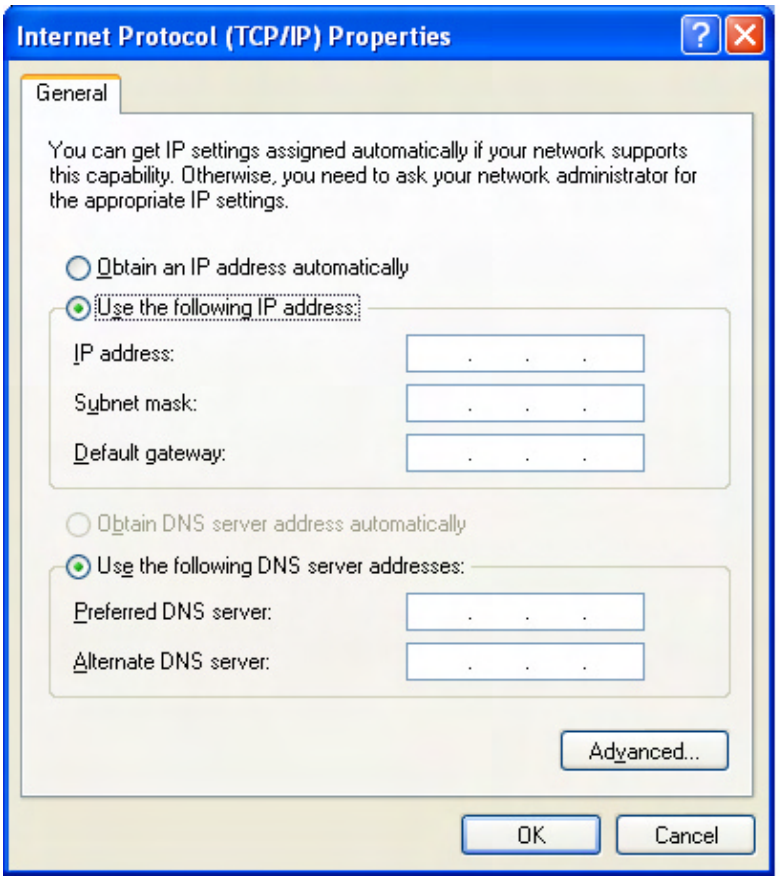


9. Right click on the Local Area Connection icon, will appear a menu.

10. Select properties; will appear the following window.



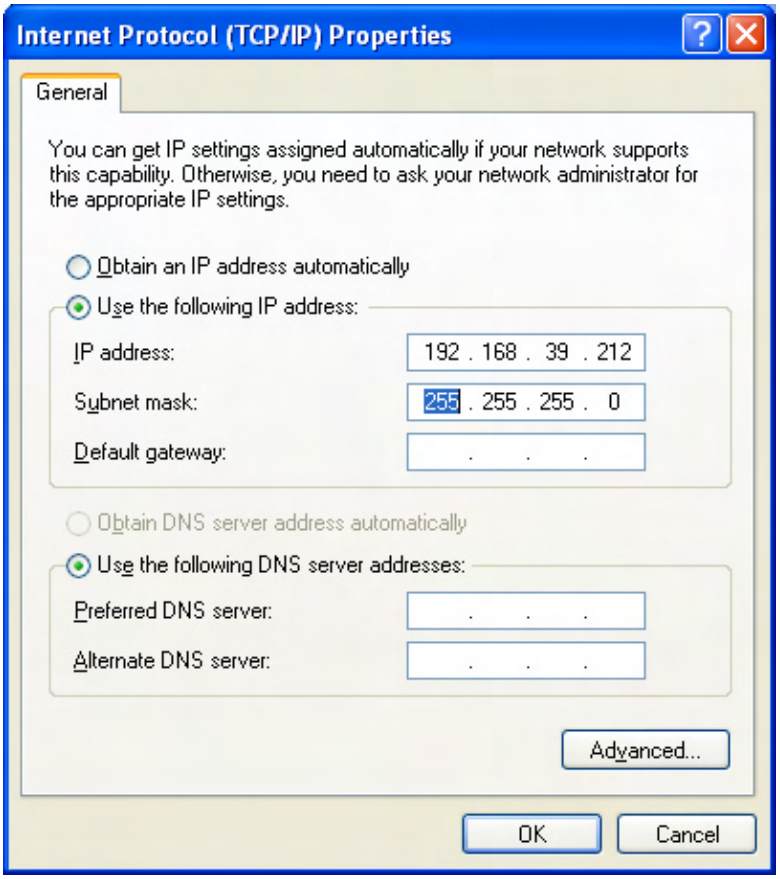
11. In order to configure the TCP/IP protocol, select TCP/IP Protocol option and press the Properties key, will appear the following window.



12. Select Use the following IP address and fill the fields IP address and Subnet mask. The other parameters are not obligatory except different needs specified from the network administrator.

13. The network administrator must provide all the network parameters.

NOTE: normally you should never select the option “Obtain an IP address automatically”, because the DICOM devices must have static (that is not changing over the time) IP address to enable them to send data to other DICOM devices..



Performing MyLab70 Configuration for DICOM

This section deals with the **MyLab70** and **MyLab Gold Platform** (now indicated all as **MyLab**)configuration for enabling the supported DICOM functions.

The DICOM functions available with **MyLab** are indicated in our DICOM Conformance Statement.

The Service key is required

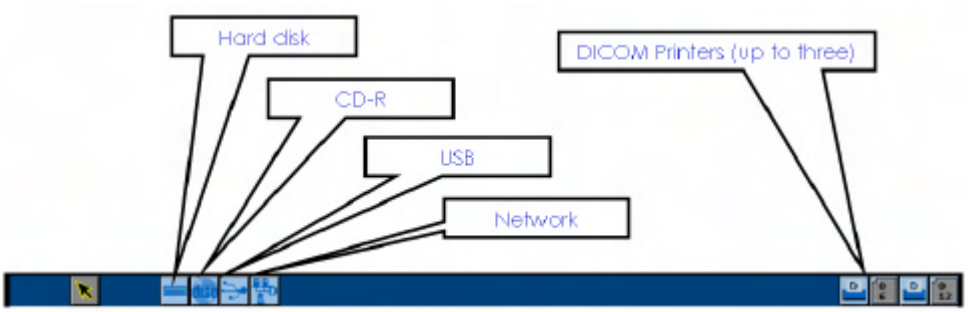
This procedure can be activated only if the Service key is inserted before switching on the unit.

Before proceeding with the configuration it's necessary that the DICOM option has been enabled.

MyLab Icons

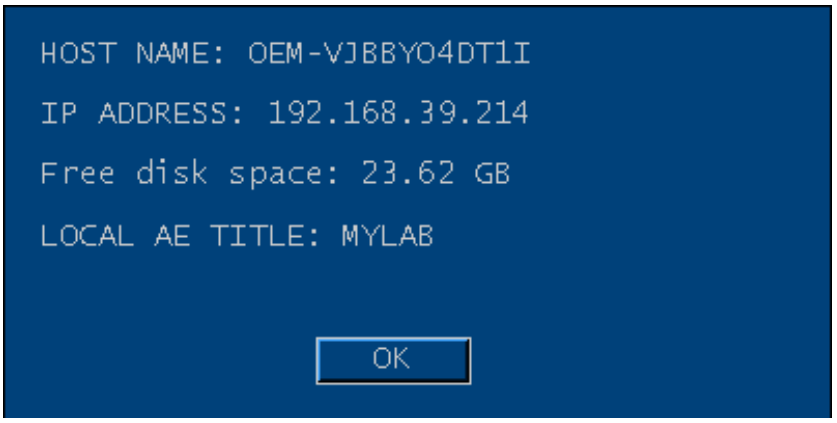
Before all, please note that for accessing the various menus associated with the top icons you must freeze the image and press the "Pointer" button. Going with the pointer over the blue icons you can access a context-sensitive menu pressing the right button, while pressing the left button you get the action corresponding to the first item of the above menu.

When a problem occurs, a red sign appears over the corresponding icon.



Network Configuration

Left-clicking the Hard Disk icon shows the "Properties" item of the corresponding menu. A message box will appear with the IP present Host Name, IP Address, free HD space and Application Entity Title of the MyLab.

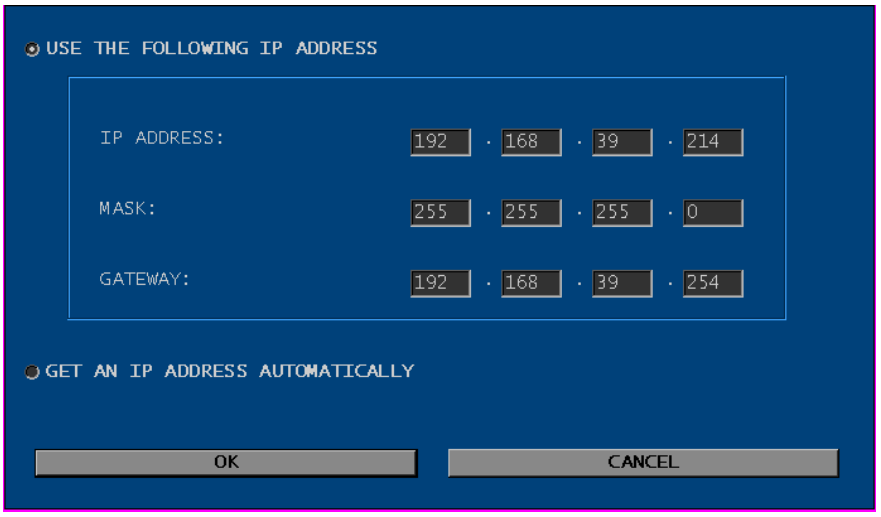


Right-clicking the Hard Disk icon and selecting "Network Configuration" (this item is present only with the Service dongle) shows the normal Windows XP network configuration panel: using it you can completely configure the network (IP address, DNS, etc.).

Right-clicking the Hard Disk icon and selecting "IP Address Configuration" shows a panel in which you can configure the IP Address.

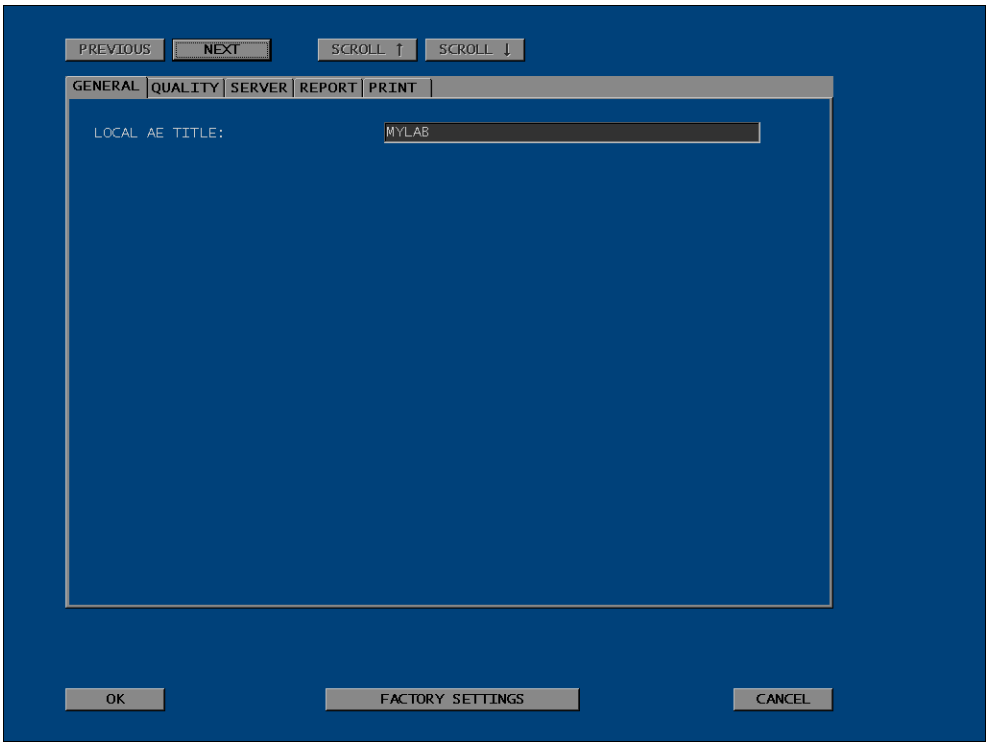
Please note that selecting "GET AN IP ADDRESS AUTOMATICALLY" (that is, use the DHCP) could not work in DICOM environment, because the DICOM Archives and Printers normally need to know the IP Address of the MyLab to allow it to send/print images.

When using this panel instead of the Windows XP network configuration, you cannot enable the DNS, so you will need to input the numeric IP Address of the DICOM Archives and Printers.



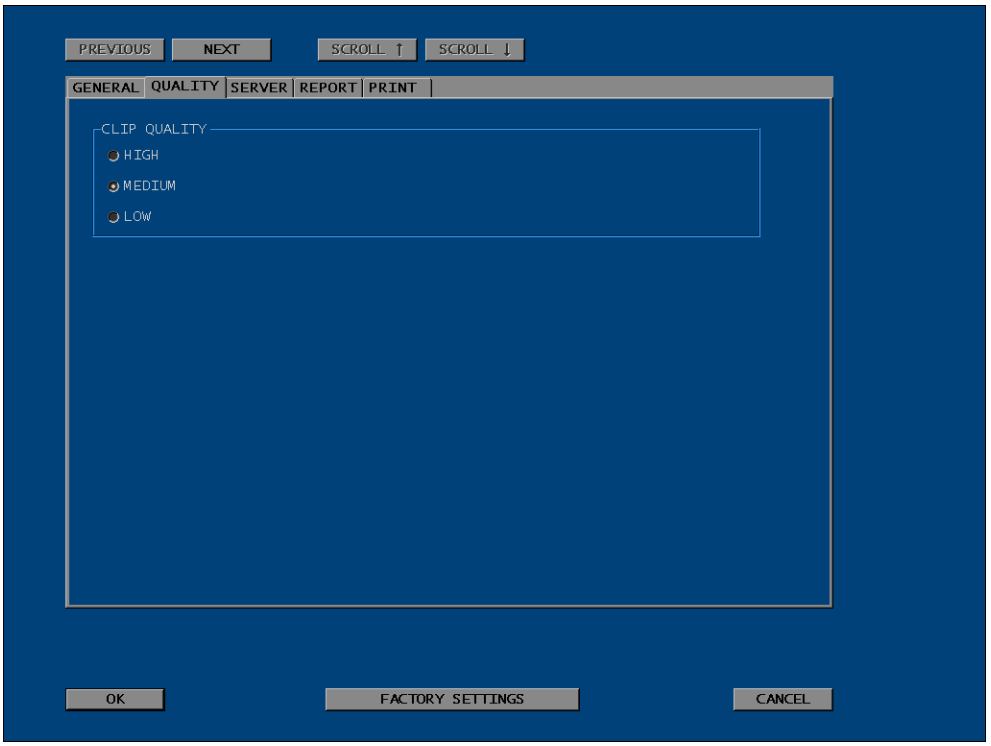
DICOM Configuration - General

Pressing the “MENU” button and selecting “DICOM CONFIGURATION” the DICOM configuration panel will pop up. In the GENERAL tab you can modify the local Application Entity Title of the MyLab (the default is “MYLAB”). Please note that the AE Titles are case sensitive.



DICOM Configuration - Quality

The images and clips are always sent and stored in DICOM using the lossy JPEG compression. In the “QUALITY” tab you will be able to select the quality level (HIGH=high quality, low compression, LOW=low quality, high compression).



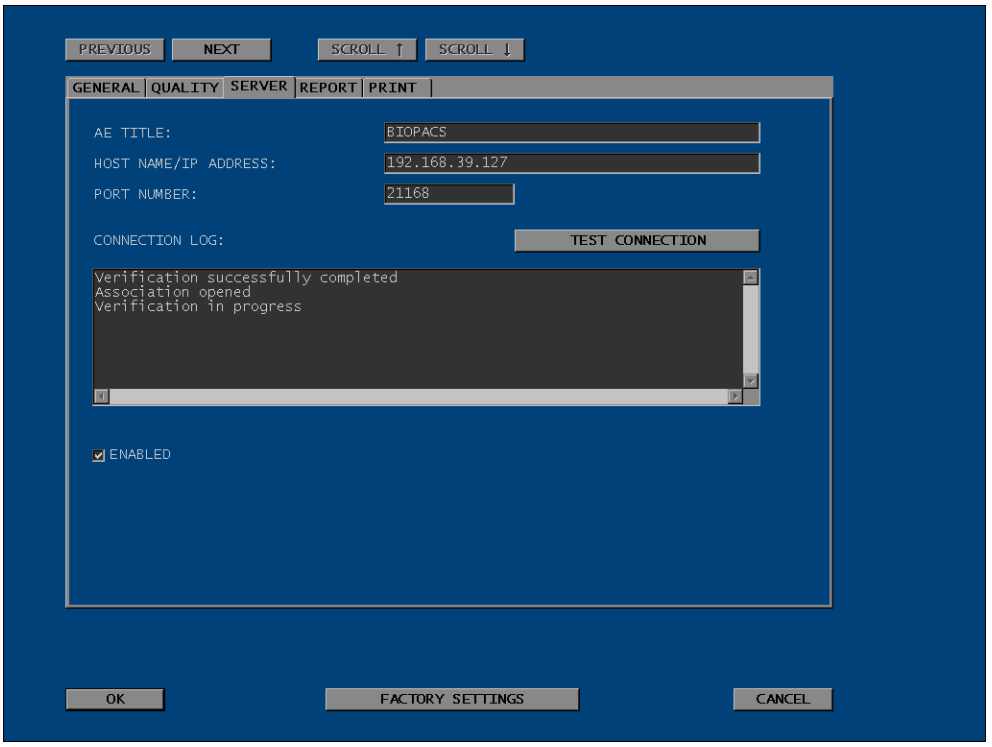
DICOM Configuration - Server

In the “SERVER” tab you can input the configuration of the DICOM archive to send the images to.

By pressing the “TEST CONNECTION” button you can send a Verification (C-ECHO) DICOM message to the server, to verify if at its IP Address and TCP port there is a listening DICOM application.

Please note that normally this test does not check the AE Titles: the server will normally reply with a successful message even if the AE Titles are misspelled.

The results of the test appear scrolling backward (last line first).

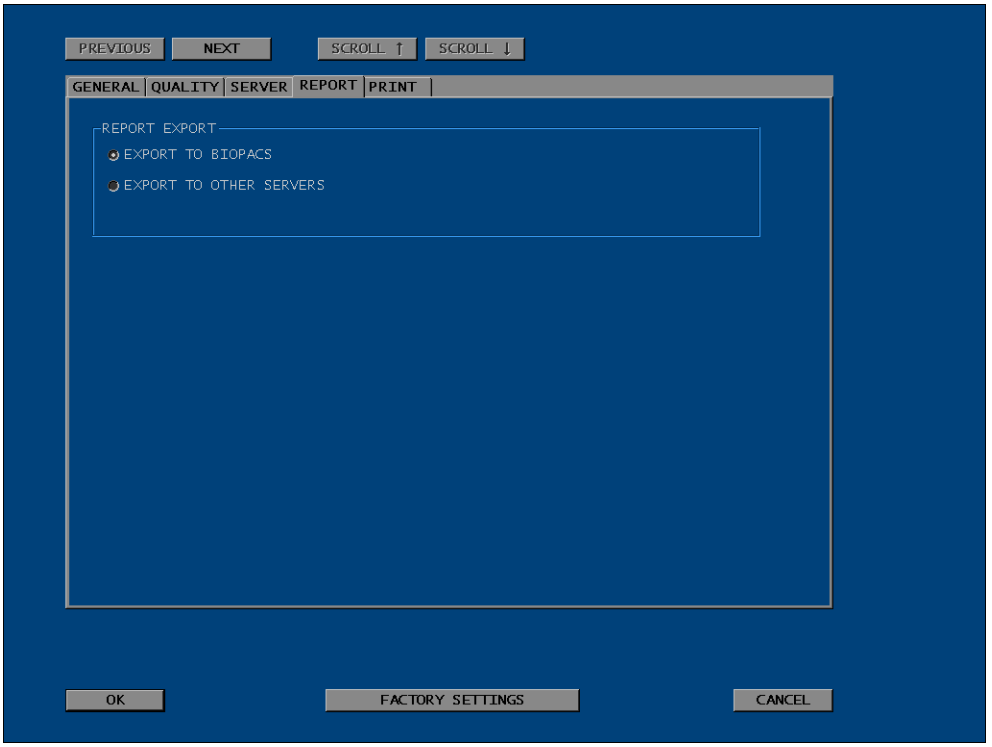


DICOM Configuration - Report

In the “REPORT” tab you can decide the way to export (to DICOM server or CD-R or USB) the measures and report.

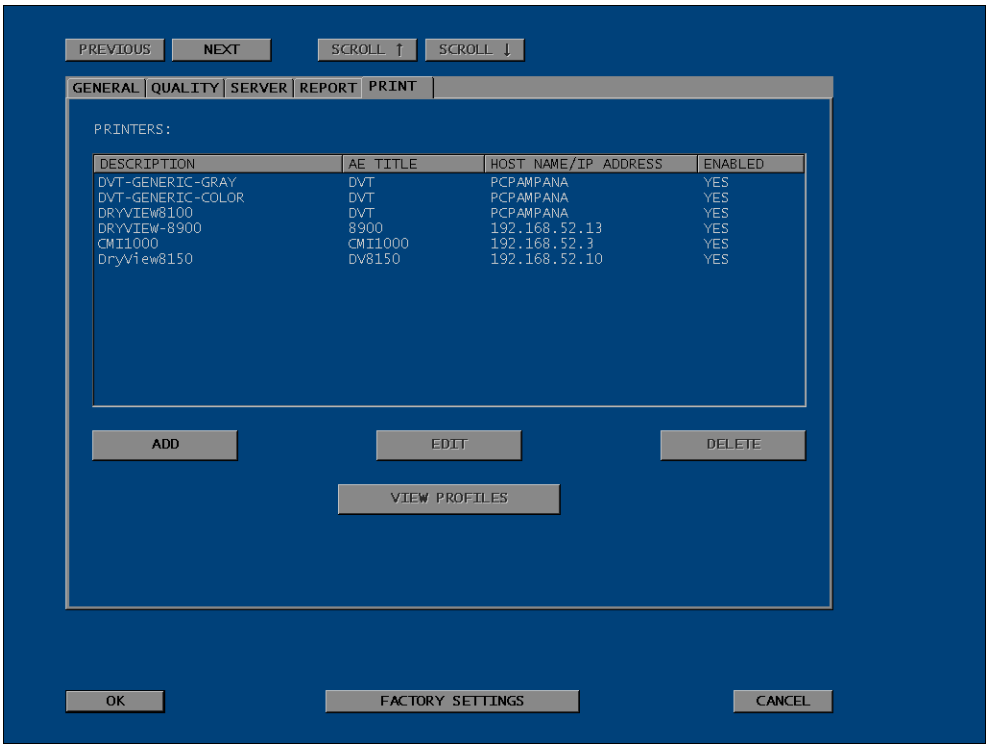
By selecting “BIOPACS” they will be put in a proprietary DICOM attribute, that the BioPACS can read.

By selecting “OTHER SERVERS” they will be written in Secondary Capture images that everybody can read.



DICOM Configuration - Print

In the “PRINT” tab you will see the list of configured DICOM printers. You can add, edit or delete any item from the list. For every DICOM printer you can open the profile configuration panel by selecting the printer and pressing “VIEW PROFILES”.



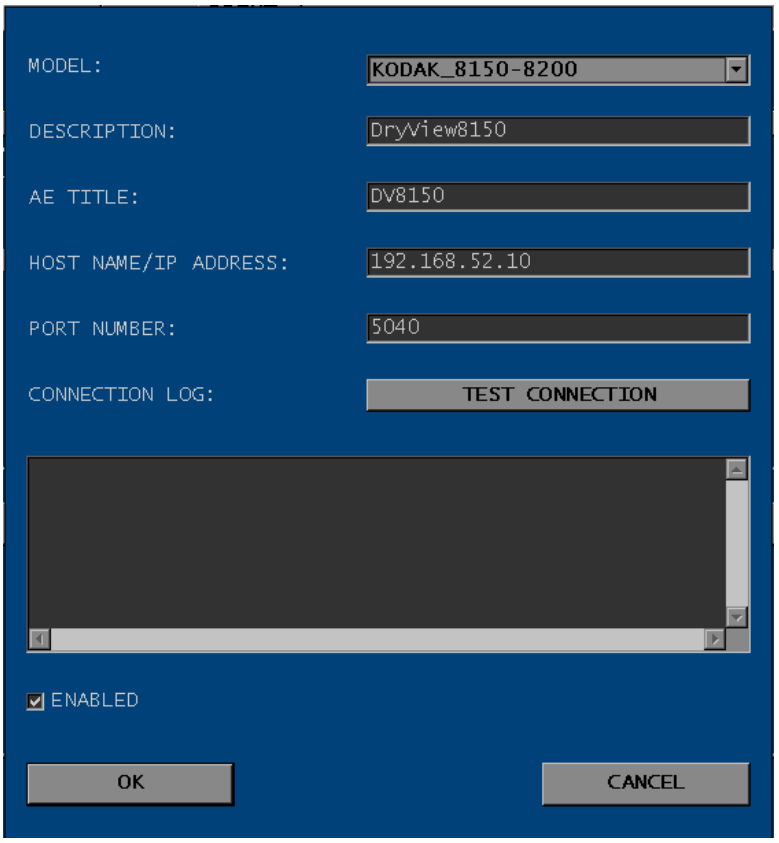
Adding a DICOM Printer

Adding a new printer is like selecting a DICOM server. The only difference is that you must select a printer model. If the desired model does not appear in the list, it is normally possible to print using the "GenericPrinter" model. The description is a mnemonic description you decide to assign to the printer you are configuring.

By pressing the "TEST CONNECTION" button you can send a Verification (C-ECHO) DICOM message to the printer, to verify if at its IP Address and TCP port there is a listening DICOM application.

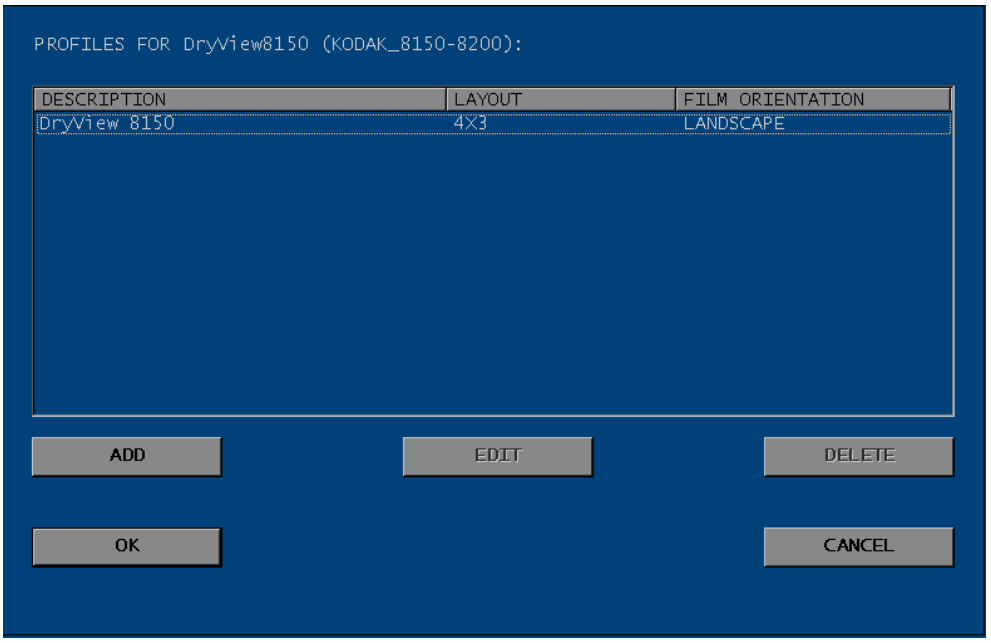
Please note that normally this test does not check the AE Titles: the printer will normally reply with a successful message even if the AE Titles are misspelled.

The results of the test appear scrolling backward (last line first).



Managing the Printer Profiles

For every configured DICOM Printer you can prepare one or more Printer Profiles. When adding a new printer, the pre-defined printer profile is inserted in the list; you can modify it or add other profiles.

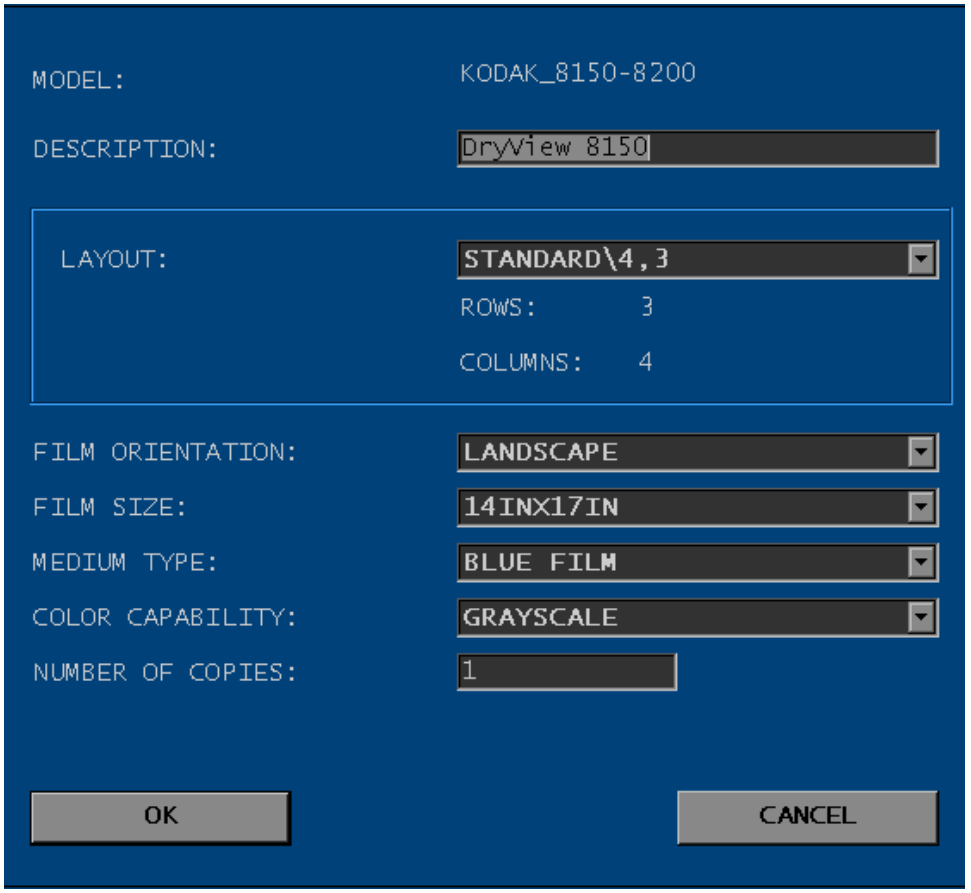


Adding a Printer Profile

You can configure the DICOM Printer Profiles according to the printing needs. For a given printer model, only the valid choices will be shown.

The “DESCRIPTION” is a mnemonic name you can assign to the printer profile you are configuring.

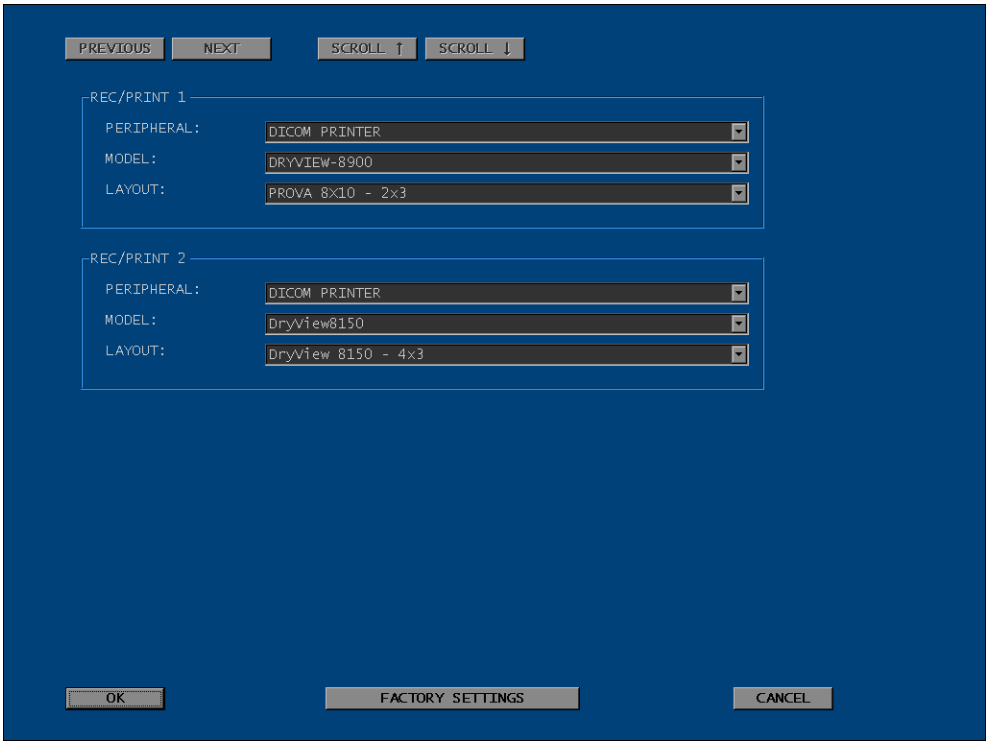
For the Layout, please note that only the “STANDARD\c,r” DICOM formats are allowed, where c is the number of columns and r the number of rows. If you select “Landscape” for the Film Orientation you will probably need a Layout in which the number of of the columns is greater than the number of the rows.



Configuring the Print buttons

Pressing the “MENU” button and selecting “PERIPHERALS” the peripheral configuration panel will pop up. In this panel you can select a peripheral to be assigned to each REC/PRINT button (two or three according to the model).

By selecting DICOM PRINTER you will be able to chose the Model among the configured DICOM printers; after selecting the DICOM printer, you will be able to select the Layout among the configured printer profiles for that printer.



Saving and sending images

When closing the current exam (“START END” button), by checking the “ARCHIVE” selection, you can

- archive it in proprietary format in the local database (“DB”);
- save it in DICOM format on a CD-R or CD-RW (“CD”);
- save it in DICOM format on a Pen Drive (“USB”);
- send it to a DICOM server (“DICOM SERVER”).

By selecting one or more exams from the “ARCHIVE REV.” panel, and pressing the “DICOM” smart key, you can

- save them in DICOM format on a CD-R or CD-RW (“CD”);
- save them on a Pen Drive (“USB”);
- send them to a DICOM server (“DICOM SERVER”).

In every case, you can decide to anonymize the images, removing the DICOM attributes that could identify the patient.
Before saving the images on a CD-RW, you can erase it by selecting the “ERASE DEVICE” item in the menu that can be accessed by right-clicking the CD icon.

In case of failure, a red sign will appear over the corresponding icon (CD, USB or Network); left-clicking over the icon will show the “OPERATION” panel with the list of the failed and successful operations. It is possible to retry the failed operations. To remove the red sign select the “RESET FAILURE FLAG” from the menu that appears left-clicking over the icon.

Printing images

You can print in DICOM every displayed image, by pressing the REC/PRINT buttons configured for a DICOM printer.

Every time that you press the REC/PRINT button, the image is added to the current film, that will be actually printed when the number of images for that format have been added.

The images printed from the real time and “EXAM REV.” environments are added to a different film from the images printed from the “ARCHIVE REV.” environment.

When closing the current patient (“Start End”), the current films are printed.
In case of failure, a red sign will appear over the corresponding icon; left-clicking over the icon will show the “OPERATION” panel with the list of the failed and successful operations. It is possible to retry the failed operations. To remove the red sign select the “RESET FAILURE FLAG” from the menu that appears left-clicking over the icon.

From the above menu it is also possible to

- force the printing of the current film (“PRINT NOW...”);
- delete all the images already added to the current film (“RESET ADDED IMAGES”).

Troubleshooting

In case of DICOM problems, the first thing is to verify that the network is working correctly. To do this follow these steps:

- reboot after inserting the Service dongle;
- freeze the image and press POINTER;
- press <Esc> and <Ctrl>: the normal Windows XP Start menu will pop up;
- select “Run...” and input “cmd”
- in the command window try to ping the gateway (if any) and the destination server and printers.

Please note that Windows XP SP2, by default, enables the embedded firewall, so that, if you want to send data to a server installed in a PC with such Operating System, it is possible that from the PC you can ping the MyLab, but from the MyLab you cannot ping the PC. In this case you must disable or configure the firewall in the server’s PC.

When you are sure you can ping the destination(s) from the MyLab, perform a verification, and then try to really send the data. If it does not work, write down the error(s) that appear in the OPERATIONS panel (select the item and press DETAILS), and collect the log files.

Collecting the log files

In case of DICOM problems, please collect the DICOM log files:

- reboot after inserting the Service dongle;
- freeze the image and press POINTER;
- insert a USB pen drive;
- select “EXPORT LOG FILES TO USB”;
- after successfully exporting them, the DICOM log files are in the \MyLab_Log_Files\Dinamo folder of the pen drive.

When sending the log files, please describe carefully the situation, the errors from the OPERATIONS panel, etc.

Chapter 13

Safety Test

Every **MyLab70** and **MyLab Gold Platform** (now indicated all as **MyLab**) units comply with EN60601-1 (IEC 60601-1) standard. **MyLab** is Class I Type B and BF (Ultrasound probe) and CF (ECG) applied parts.

It's strongly recommended to perform Safety Tests every time new peripherals are powered through the plugs on the backside of the power supply, or you have to replace the following parts:

- Power Supply Group (SPR, SPS, Main Power)
- PSE board (ECG connector)

Anyway we suggest to repeat the safety tests every two years. If the system is used in the Intensive Coronary Care, it's suggested to repeat the safety tests once a year.

WARNING

Whenever the measured values exceed the reference ones (see the following table) don't use the unit and send it to ESAOTE

The parameters to be tested are the following:

- Impedance of Protective Earth Connection
- Earth Leakage Current
- Enclosure Leakage Current
- Patient Leakage Current
- Patient Auxiliary Current

This chapter defines safety parameters and their range according to EN60601-1 standard and describes the safety tests to be carried out on the equipment.

Note

Performing the safety test, the operator has to keep attention also to follow all the precautions to avoid risks of electrical shocks.

Definitions

1) Impedance of Protective Earth Connection

The impedance between the Protective Earth (PE) terminal of the mains input connector and any accessible metal part.

2) Earth Leakage Current

The current that flows from the mains terminals (P=Phase, N=Neutral) to the Protective Earth (PE) through the insulation.

3) Enclosure Leakage Current

The current that flows between the enclosure and the Protective Earth (PE) terminal.

4) Patient Leakage Current

The current that flows through the applied parts (i.e. ECG and US probe) towards the Protective Earth (PE).

5) Patient Auxiliary Current

The current that flows between two different applied parts (i.e. between two ECG electrodes).

The table below provides the user with a list of the parameters to be checked, the maximum values are referenced to the IEC 601-1 standard (1988), II Edition.

Parameter	Max Value N.C.	Max Value S.F.C.	EN 60601-1
Impedance of protective earth connection (with Mains Power cable)	0.2 Ω	-	18.f
Earth leakage current	0.5 mA	1 mA	19.4.f
Enclosure leakage current	0.1 mA	0.5 mA	19.4.g
Patient leakage current	CF 0.01 mA B/BF 0.1 mA	CF 0.05mA B/BF 0.5 mA	19.4.h
Patient leakage current (mains on applied part)	-	CF 0.05 mA BF 5 mA	19.4 h
Patient auxiliary current	CF 0.01 mA ac B/BF 0.1 mA ac	CF 0.05 mA ac B/BF 0.5 mA ac	19.4.j

N.C. Normal Condition
S.F.C. Single Fault Condition

NOTE

The test must be carried out by skilled personnel using equipment compliant with the reference standard indicated. ESAOTE recommends the use of the automatic BIO-TEK 601-PRO equipment manufactured by BIO-TEK Instruments INC. or equivalent equipment.

MyLab safety test - Operating Procedures

Tools

Tool	Dimension
BIOTEK 601 Pro or equivalent	-
Metal foil	maximum size 20 x 10 cm

> Note
>
> Before proceeding with the safety tests, be sure of the equipment (BIOTEK 601 Pro or equivalent) calibration.

Procedure

- Power the automatic testing equipment through mains supply and the equipment under test through the automatic equipment, as shown in the Fig.1 and 2

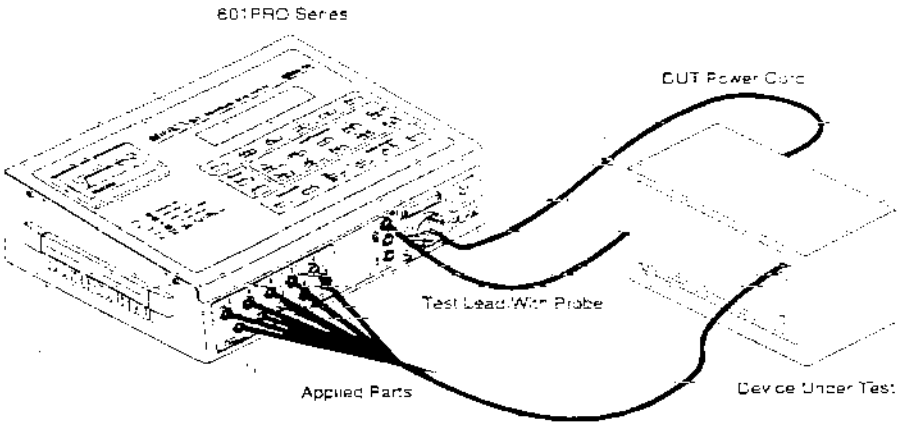


Figure 1.

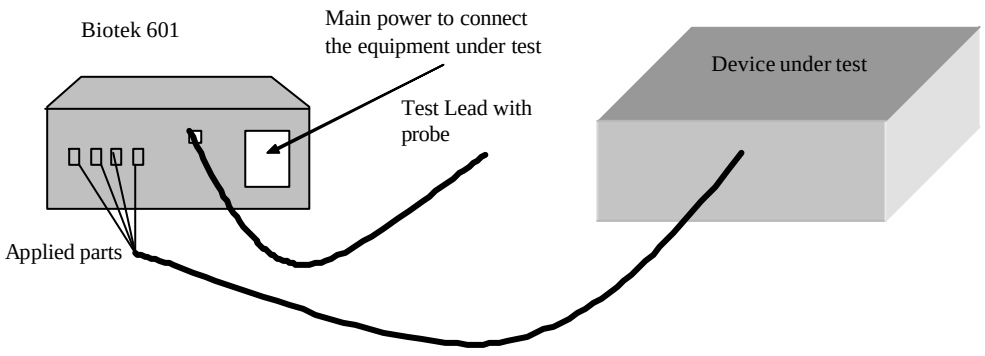


Figure 2

- The ECG cable must be connected to the MyLab ECG connector (if present) and the applied parts terminals in the automatic equipment (see Fig.1 and 2).
- Set the automatic equipment according to its user manual in order to perform a Class I, Type CF equipment test.

Measuring the Impedance of Protective Earth connection

- Connect the test lead to **MyLab** equipotential node.
- Activate the procedure for measuring the Impedance of Protective Earth on the automatic equipment.
- Check that the value indicated complies with the indications given in the reference table for normal condition (NC).

If the measured value is higher than the value in the table, do not use the equipment and send to ESAOTE.

Measuring the Earth leakage current

- Activate the procedure for measuring the earth leakage current on the automatic equipment:

  1.1 Check that the value indicated complies with the indications given in the reference table for normal condition (NC).

  1.2 Repeat the procedure simulating a break in a power conductor, by means of the automatic equipment, and check that the value indicated complies with the indications given in the reference table for the single fault condition (SFC).

- Repeat the above measurement procedures inverting the polarity of the power conductors, by means of the automatic equipment

If any measured value is higher than the value in the table, do not use the equipment and replace the power cable. Repeat the procedure with the new cable and if the values continue to be higher, send the equipment to ESAOTE.

Measuring the Enclosure Leakage Current

- Connect the test lead to the metal foil.

  1.1 Place the metal foil in close contact with the unit and activate the procedure for measuring the enclosure leakage current on the automatic equipment; varying the foil position, check that the value indicated complies with the indications given in the reference table for the normal condition (NC)

  1.2 Repeat the procedure simulating a break in the earth wire, by means of the automatic equipment, and check that the value indicated complies with the indications given in the reference table for the single fault condition (SFC).

  1.3 Repeat the procedure simulating a break in a power conductor, by means of the automatic equipment, and check that the value indicated complies with the indications given in the reference table for the single fault condition (SFC).

- Repeat the above measurement procedures inverting the polarity of the power conductors, by means of the automatic equipment.

If any of the measured values are higher than the value in the table, do not use the equipment and send it to ESAOTE.

Measuring the Patient Leakage Current (ECG cable)

- Insert the ECG cable leads in the applied parts terminals in the automatic equipment.

  1.1 Activate the procedure for measuring the Patient leakage current on the automatic equipment and check that the value indicated complies with the indications given in the reference table for the normal condition (NC).

  1.2 Repeat the procedure simulating a break in the earth wire, by means of the automatic equipment, and check that the value indicated complies with the indications given in the reference table for the single fault condition (SFC).

  1.3 Repeat the procedure simulating a break in a power conductor, by means of the automatic equipment, and check that the value indicated complies with the indications given in the reference table for the single fault condition (SFC).

  1.4 Repeat the procedure simulating the application of the mains voltage, by means of the automatic equipment, to the plugs on the patient cable and check that the value indicated complies with the indication given in the reference table for the single fault condition (SFC).

- Repeat the above measurement procedures inverting the polarity of the power conductors, by means of the automatic equipment.
- If any of the measured values are higher than the value in the table, do not use the equipment and replace the ECG patient cable. Repeat the procedure with the new cable and if the values continue to be higher, send the equipment to ESAOTE.

Measuring the Patient Auxiliary Current

- Activate the procedure for measuring the patient auxiliary current on the automatic equipment and check that the value indicated complies with the indications given in the reference table for the normal condition (NC).
- Repeat the procedure simulating a break in the earth wire, by means of the automatic equipment, and check that the value indicated complies with the indications given in the reference table for the single fault condition (SFC).
- Repeat the procedure simulating a break in a power conductor, by means of the automatic equipment, and check that the value indicated complies with the indications given in the reference table for the single fault condition (SFC).
- Repeat the above measurement procedures inverting the polarity of the power conductors, by means of the automatic equipment.

If any of the measured values are higher than the value in the table, do not use the equipment and replace the ECG patient cable. Repeat the procedure with the new cable and if the values continue to be higher, send the equipment to ESAOTE.

WARNING

The defective patient cable or power cable must not be used

Probe safety tests

For any probe in use with the unit, repeat the procedure for measuring the Patient Leakage Current test (without application of mains voltage on applied part), wrapping the probe enclosure with the metal foil and connecting the test lead to it. The test must be performed in any Real Time mode application. The probe must be connected to the unit

1.1 Activate the procedure for measuring the Patient leakage current on the automatic equipment and check that the value indicated complies with the indications given in the reference table for the normal condition (NC).

1.2 Repeat the procedure simulating a break in the earth wire, by means of the automatic equipment, and check that the value indicated complies with the indications given in the reference table for the single fault condition (SFC).

1.3 Repeat the procedure simulating a break in a power conductor, by means of the automatic equipment, and check that the value indicated complies with the indications given in the reference table for the single fault condition (SFC).

Repeat the above measurement procedures inverting the polarity of the power conductors, by means of the automatic equipment.

If any of the measured values are higher than the value in the table, do not use the probe and send it to ESAOTE.

WARNING

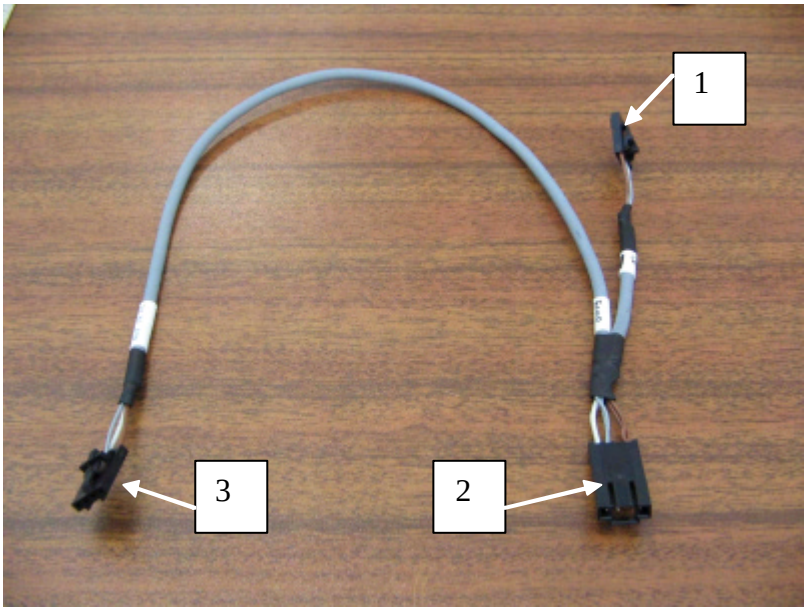
Any break in the probe case or in the probe cable can cause an electrical hazard. Do not use the probe and send it back to ESAOTE for repair.

Chapter A

Hardware Modifications

Audio Hardware modifications on MyLab70 and MyLab Gold Platform Systems

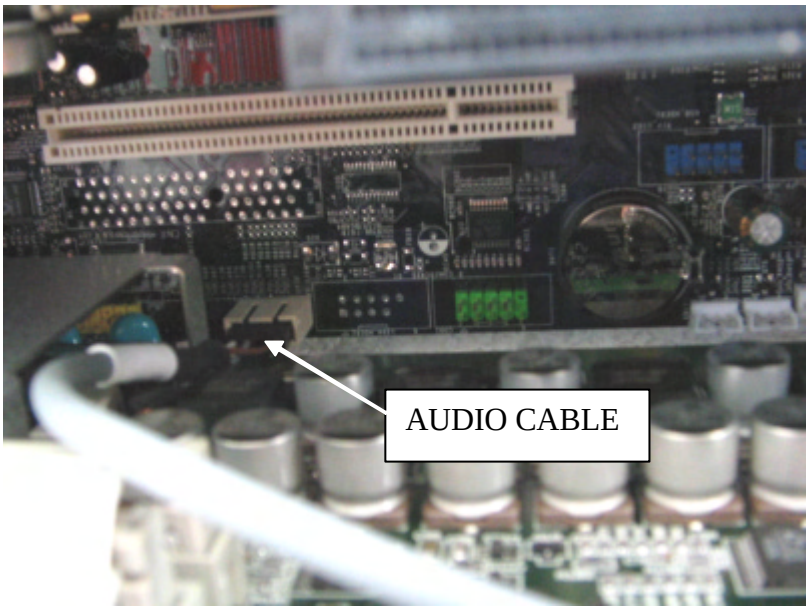
It's necessary to modify the audio connections inside the PC group, in order to improve the audio Doppler. For this reason the cable code 8830938000 has been introduced (see next picture)



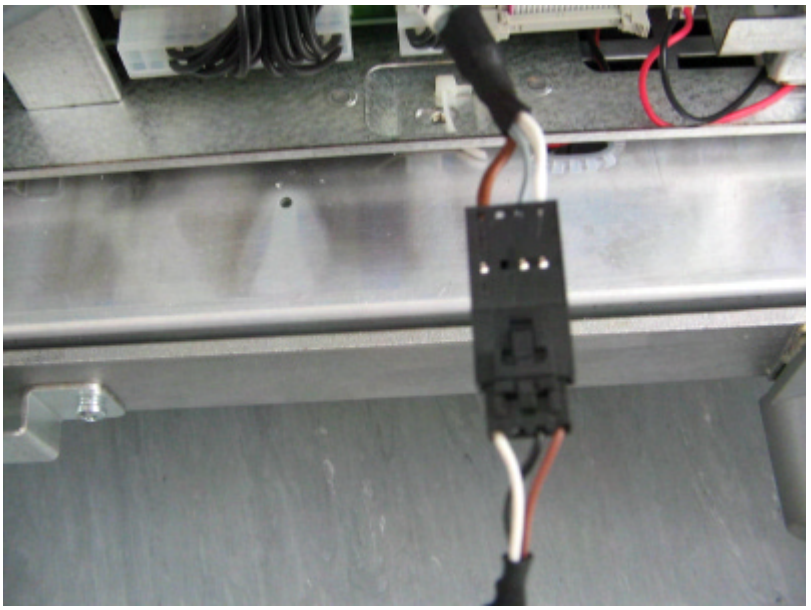
Connector 1: MALE connector PVA IN
Connector 2: FEMALE connector ECHO
Connector 3: MALE connector AUX IN PC

The procedure is the following:

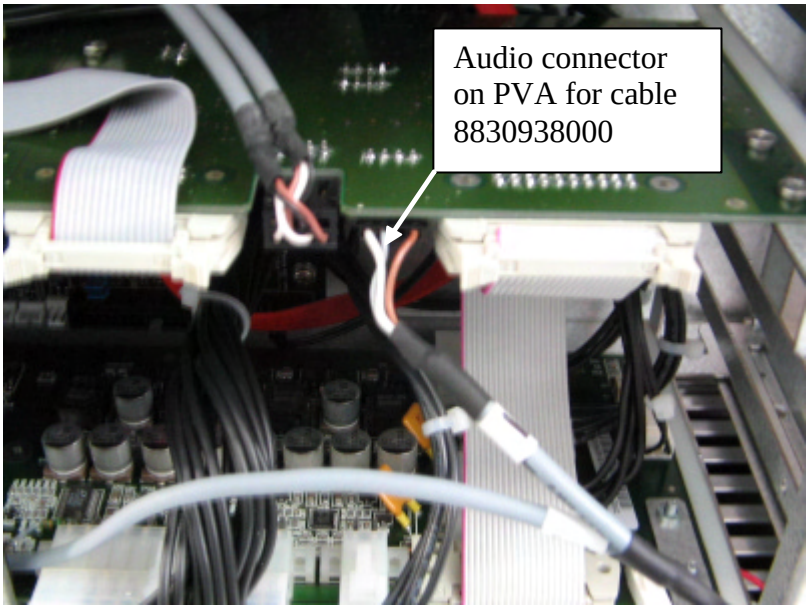
-open the system in order to access to the PC side (see service manual)
-remove the audio cable (which comes from the MyLab motherboard) connected on the PC motherboard of the PC group (the connector is in the lower part of the motherboard, close the backup battery)



-connect this cable to the female connector of the cable 8830938000 (connector nr. 2 in the first picture) as shown in the next picture



-connect the connector nr. 1 of the cable 8830938000 (MALE connector PVA IN) to the audio connector placed in the PVA board (see next picture)



-connect the third connector of the cable 8830938000 (MALE connector AUX IN PC) to the audio connector on the PC motherboard, where was connected the audio cable which comes from the MyLab motherboard

Hardware modifications on ICS

It's necessary to perform the following HW modification for the ICS board for MyLab 70 (code 9501087100) and Gold Platform (code 9501087000).

This modification avoid different problems (all the led on the probes blinking for MyLab Gold Platform and SW problems on Mylab 70).

To perform the modification (with unit off and power cord disconnected) please follow the next steps:

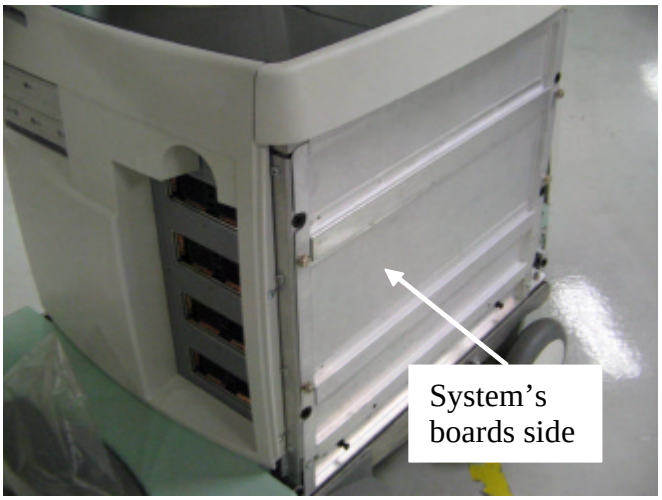
-remove the right plastic panel and the bumper

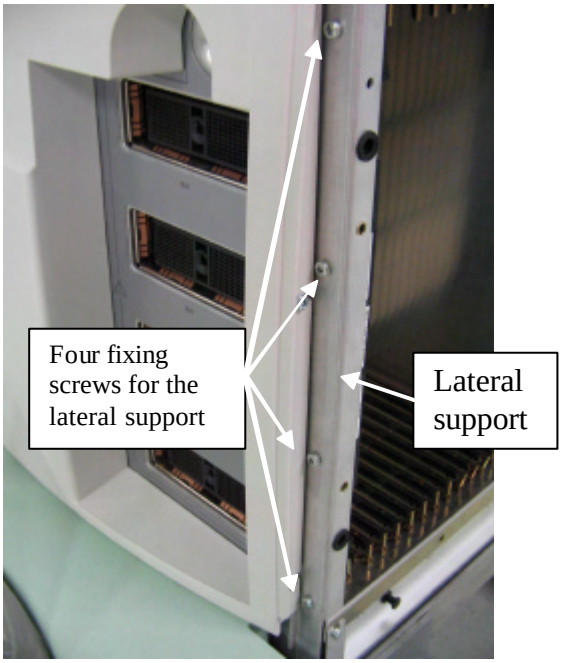
The mentioned plastic panels are not fixed with screws to the unit. To remove them it's sufficient to pull them gently. Proceed in the following way:

-raise the rear panel in order to keep better the two lateral panels

-pull the panels gently; they are fixed with four pins which match four holes on the metallic chassis.

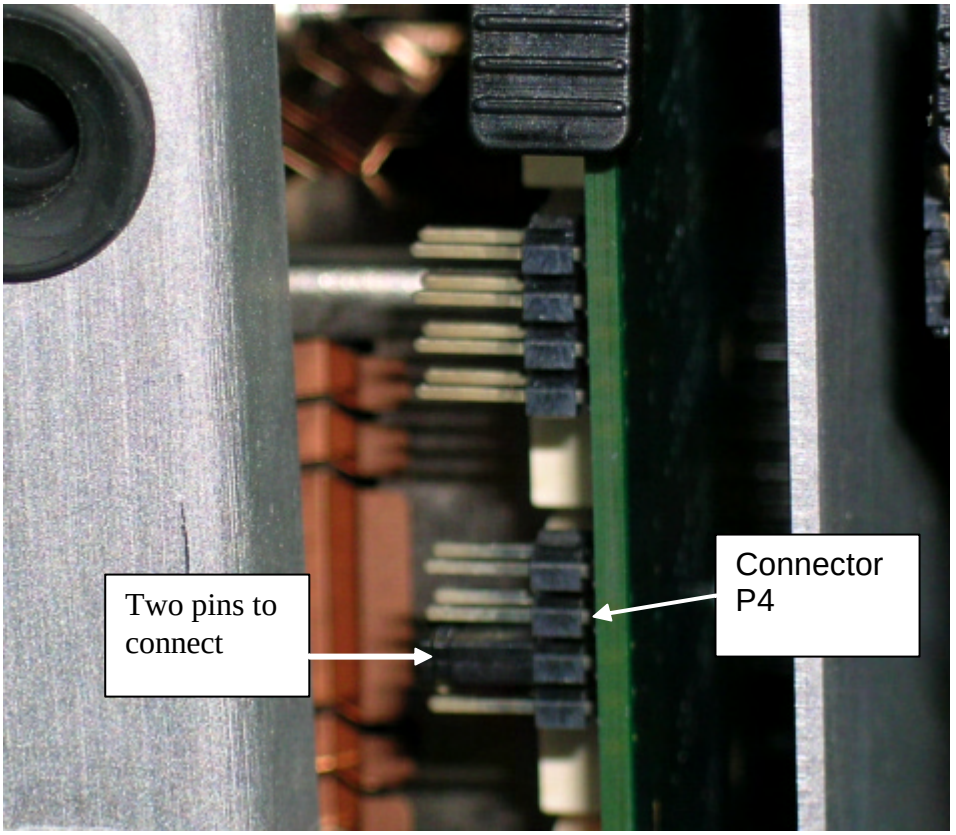
-remove the metallic panel in order to addess to the boards (unscrew the four screws on it) and remove the lateral support of the ICS (shown in the next pictures)

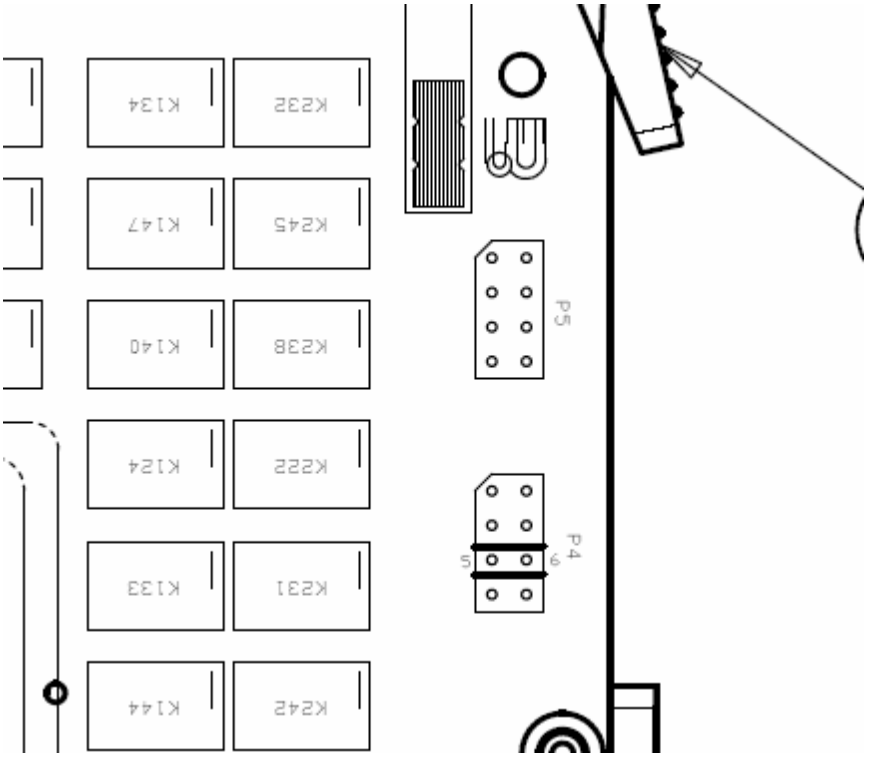




The modification must be performed on the connector P4 of the ICS board (both for MyLab 70 and Gold Platform):

Connect together the two pins on the third line from the top of the connector P4 indicated as 5 and 6 in the drawing enclosed.





-after this step close the unit and check it

Chapter B

Peripherals

This chapter deals with the procedures that must be performed in order to install the various peripherals on **MyLab70** and **MyLab Gold Platform** (now indicated all as **MyLab**) systems in the proper way.

Following the rapid replacement of the peripherals, particularly regarding the PC printer, an updated list of peripherals is available on the Esaote web site at the page:
www.esaote.com/products/ultrasound/myLabWorld/Peripherals.htm

All installation sheets and driver are available for download in the ftp site: ftp.esaote.com (user: drvdownload, password: DriverS).

In the next pages there are the installation sheet available for **MyLab**