hyperion X5 - technical manual

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TECHNICAL MANUAL

hyperion X5

Code	Rev	Date
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1. PC CONFIGURATION

1.1. SYSTEM REQUIREMENTS

hyperion X5 needs two ethernet connections, one for generic communication purposes (this supports DHCP and can be set up through the local network) and a second dedicate connection, which must set up as direct point-to-point between the unit and the INTEL PRO 1000 network card on the PC.

The PC dedicate to image aquisition (from now on referred to as “Acquisistion server”) must respect the following system specification. Such a PC can be purchased as an option directly from Cefla, the model is **Lenovo ThinkCentre Edge 73 Tower**.

System requirements:

PROCESSOR	**Intel H81, Intel Core i3 4150 (3.5GHz, 3MB L3 Cache, 1600MHz), Quad core**
RAM	4GB
HD	500GB / 7200 rpm
DVD	DVD+-RW DL
NETWORK	1 Eth Giga integrated + 1Intel(R) Gigabit CT Desktop Adapter PCI-e
O.S.	WIN7 Pro 64bit
VIDEO CARD	AMD Radeon HD 7450 PCI Express 2.0, 128 Bit, 1024 MB, DDR3
POWER SUPPLY	500W

Besides the configuration above also the following ones have been validated and tested as “Acquisition Server” for X5:

COMPONENT	**CONFIG 1**	**CONFIG 2**	**CONFIG 3**	**CONFIG 4**
PROCESSOR	1 CPU INTEL XEON E5-2630 - 2,3GHZ - 6 CORE	1 CPU INTEL I7 3770 - 3,4 GHZ – 4 CORE	1 CPU INTEL XEON E5-1620 - 3.60 GHz - 4 CORE	1 CPU INTEL XEON E3-1270 V3 – 3.50 GHz – 4 CORE
POWER SUPPLY	>= 800 W	>= 550 W	>= 600 W	>= 400 W
VIDEO CARD	ATI RADEON HD 7770 OC GHZ EDIT. VAPORX 1GB GDDR5			ATI RADEON R7 250 1GB
HARD DISK	2 SATA HDD - 300 GB - 10K RPM	1 SATA HDD - 500 GB - 10K RPM		
RAM	4 GB DDR3	8 GB DDR3 1600 MHZ		
O.S.	WINDOWS 7 PROFESSIONAL 64 BIT SP1			
NETWORK	2 ETHERNET CARDS (AT LEAST ONE INTEL PRO -1000)			
OTHER	MINIMUM SCREEN RESOLUTION 1280X1024, 64 MILLION COLORS DVD+-RW DL			

The following video cards have been tested and validated for use with hyperion X5:

VIDEO CARDS	**MINIMUM POWER SUPPLY**
ATI Radeon HD 4850 / 5770 – 1GB	>= 450 W
ATI Radeon HD 4870 / 4890 / 5850 / 5870 – 1GB	>= 500 W
Sapphire Radeon HD 6750 / 6770 – VaporX – 1GB – RAM GDDR5	>= 450 W
Sapphire Radeon HD 6850 / 6870 / 6950 / 7870 – VaporX – 1GB – RAM GDDR5	>= 500 W
Sapphire Radeon HD 7770 – GHz Ed. - OC - VaporX – 1GB – RAM GDDR5	>= 500 W
Sapphire Radeon HD 6970 – VaporX – 2GB – RAM GDDR5	>= 550 W
Sapphire Radeon HD 7850 - 1GB / 2GB - RAM GDDR5	>= 500 W
Sapphire Radeon HD 7870 - 2GB - RAM GDDR5	>= 500 W
Sapphire Radeon HD 7750 - OC - 1GB – RAM GDDR5	>= 400 W
AMD FirePro W7000 – 4GB GDDR5	>= 400 W
AMD/Sapphire Radeon R7 250 1GB – RAM GDDR5	>= 400 W
AMD/Sapphire Radeon R7 260X - RAM 1GB DDR5	>= 500 W
AMD/Sapphire Radeon R9 270 - RAM 2GB DDR5	>= 500 W

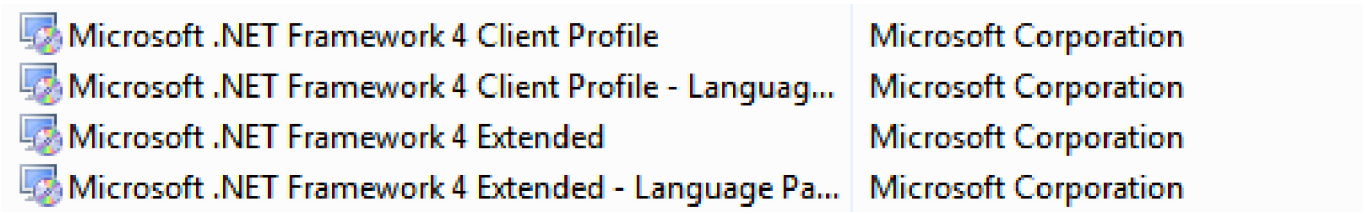
1.2. SETTING UP THE DEVICE

1.2.1. PRELIMINARY OPERATIONS

The acquisition server must comply to the system requirements detailed above. If provided from Cefla, the complete software comes preinstalled, otherwise it will be strictly mandatory to choose a compliant PC and install the software correctly.
The 2 network adapters on the acquisistion server are needed for communication with the hyperion X5.
One of these network adapters is used for a direct connection with the image detector on the X5.
If the acquisition server is not purchased from Cefla, the network adapter will be provided in the accessories box of the hyperion X5 and will need to be installed and configured on site.
The dedicated network adapter is an Intel Pro 1000 and will need a free PCI-E slot on the motherboard of the acquisition server to be installed.
The only supported operating system for the acquisition server is WINDOWS 7 PRO 64 bit. The Intel Pro 1000 will be automatically recognized by the operating system and drivers will be installed automatically.
The acquisition server must be accessed with an Administrator level user account.

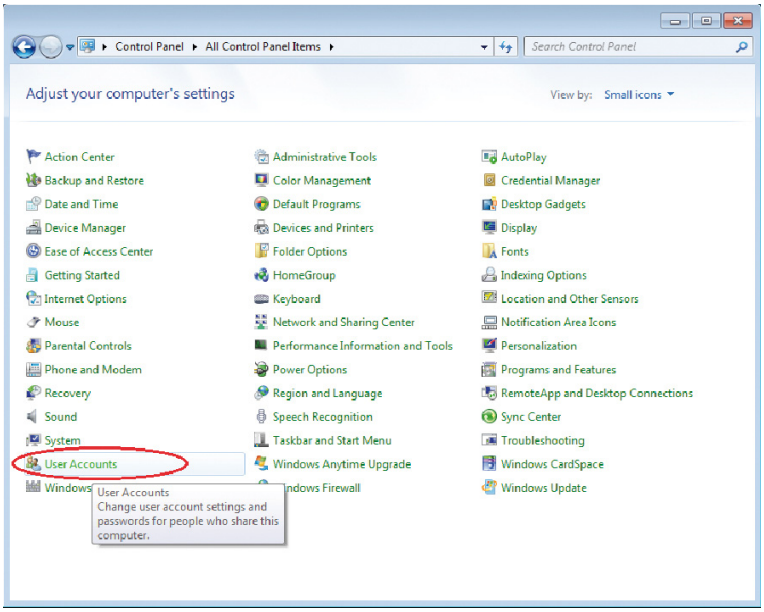
IMPORTANT: for up to date video card drivers please refer to Cefla's extranet website.

The Microsoft .NET Framework 4.0 are required for the software to work and will be installed together with the video card drivers.
Please make sure that the following entries are present in the installed programs list:

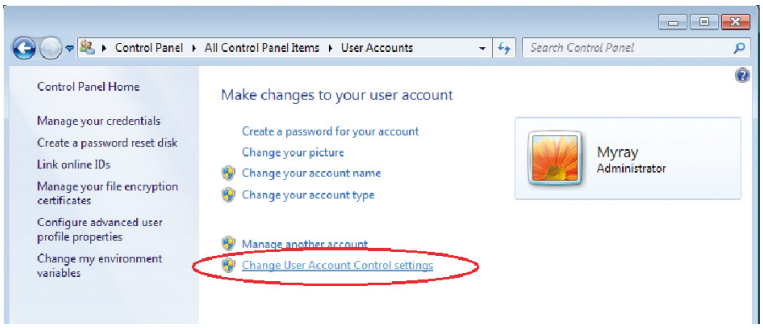


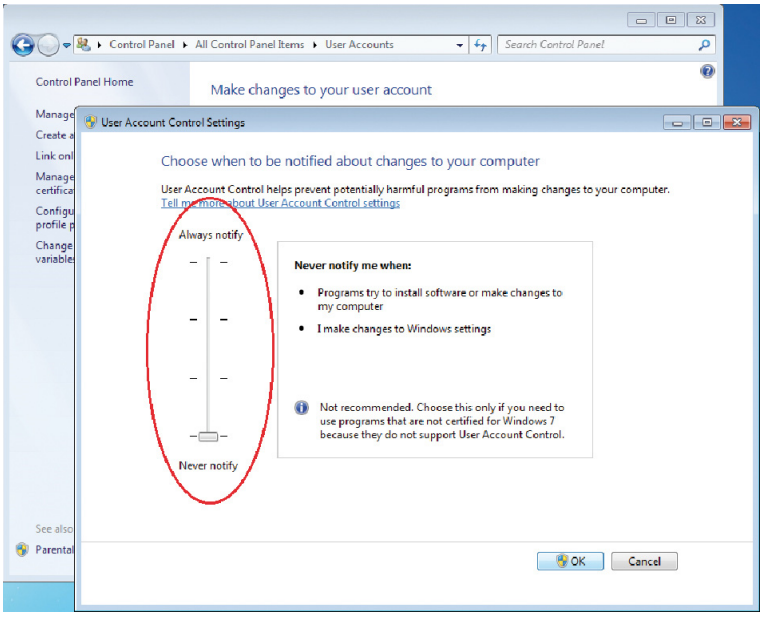
If the libraries were not installed automatically, please download them from the Microsoft website and install them manually.

1.2.2. OPERATING SYSTEM SETTINGS

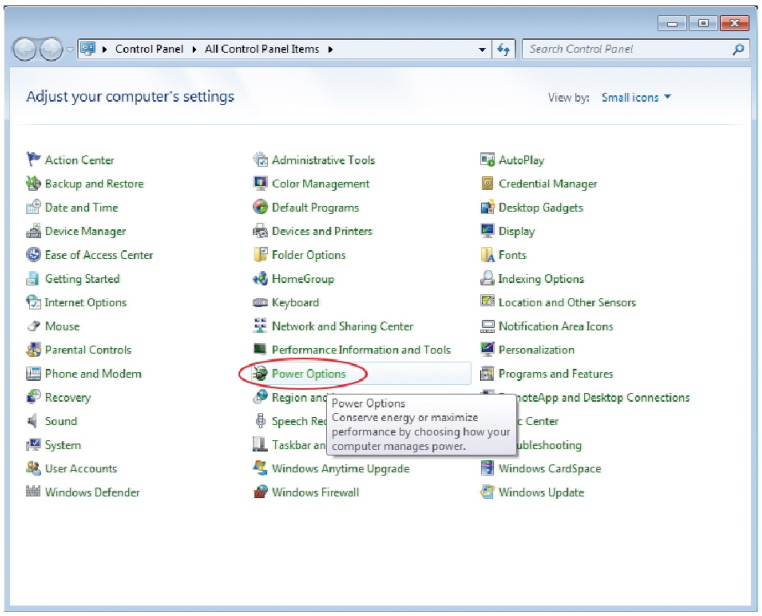


Open the Control Panel , select "User Account"and then "Change User Account Control Settings".

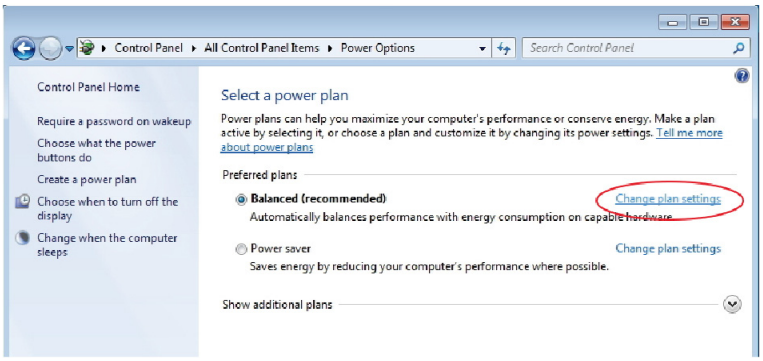




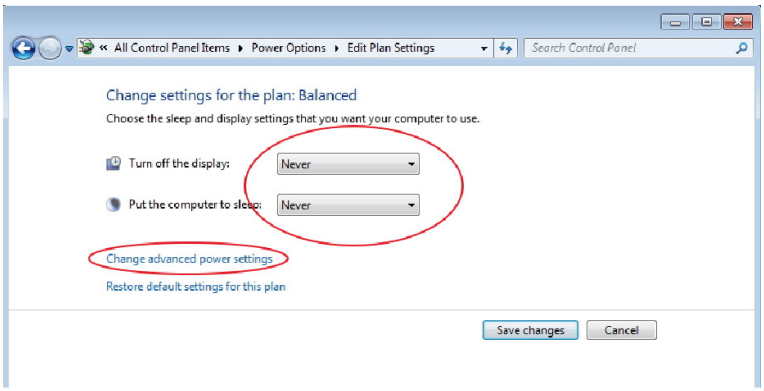
Select the lowest notification level “Never Notify”.
RESTART THE PC.



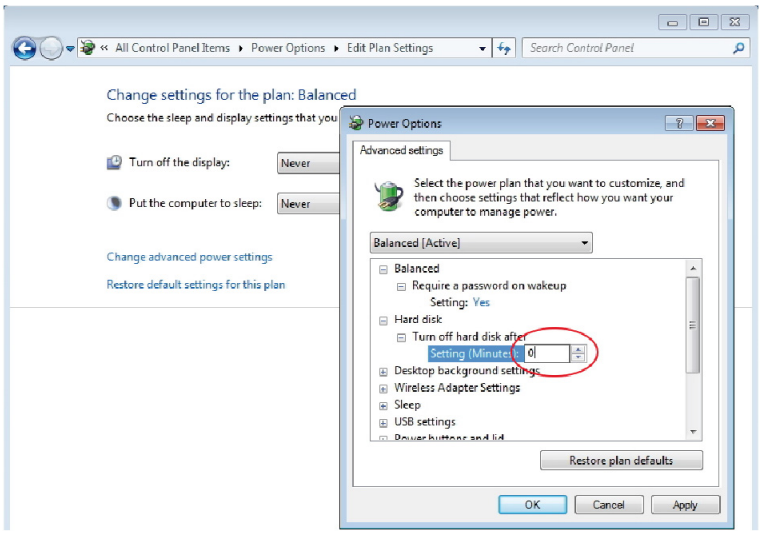
From the Control Panel select “Power Options”.



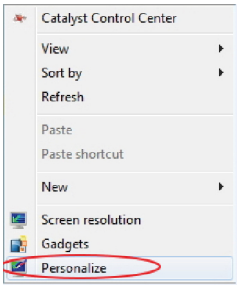
On the "Balanced"profile select "Change plan settings".



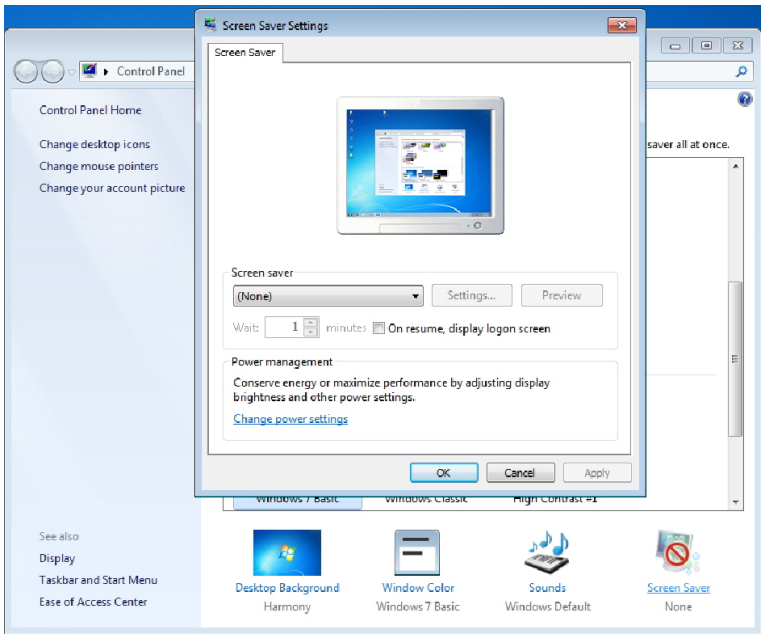
Set"Turn OFF display"and"Put the computer to sleep"to"Never". Select "Change advanced power settings".



Set"Hard disk →Turn OFF hard disk after → 0".

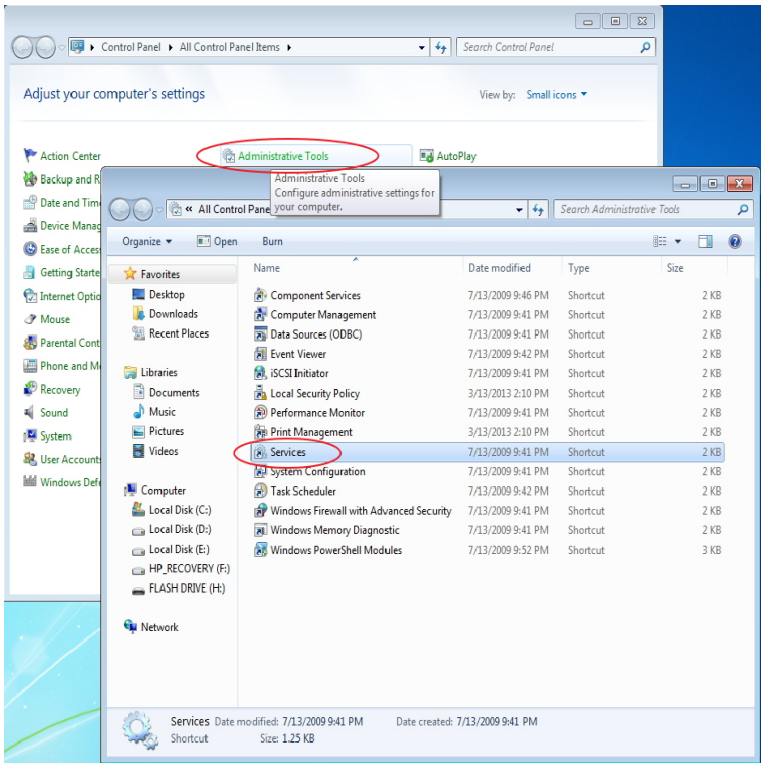


Also deactivate any screensaver. To do this right click on the mouse on any icon-free desktop or window area and select "Personalize" from the menu.

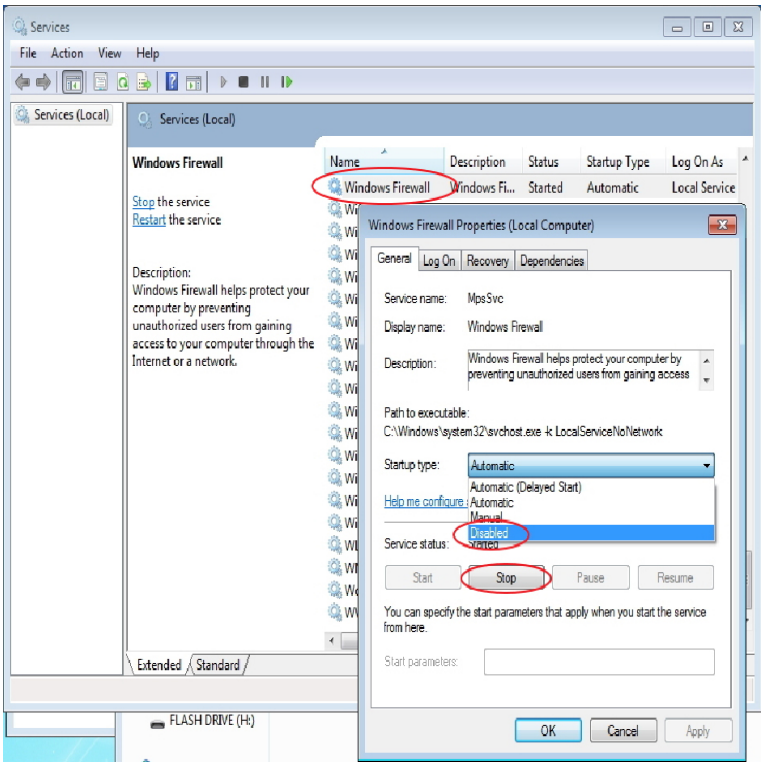


Also deactivate any screensaver. To do this right click on the mouse on any icon-free desktop or window area and select “Personalize” from the menu.

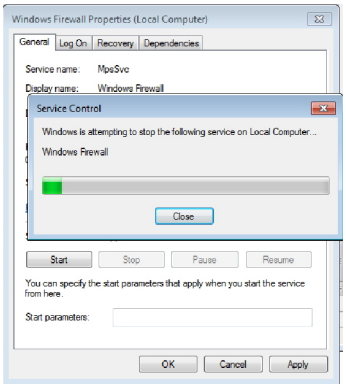
1.2.3. DISABLING WINDOWS FIREWALL



From the Control Panel select “Administrative Tools” and double click on “Services”:



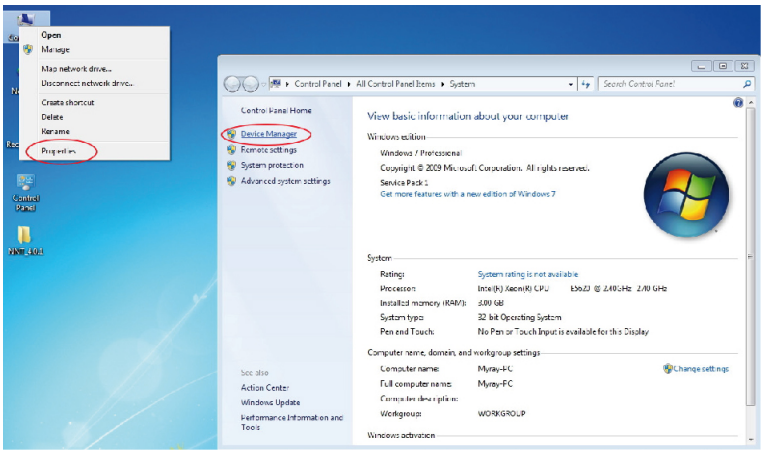
Scroll down the service list, right click on the “Windows firewall” service and double click.
Go to the “Startup type” drop-down menu and select “Disabled”. Then press the “Stop” key to stop the service currently being executed.



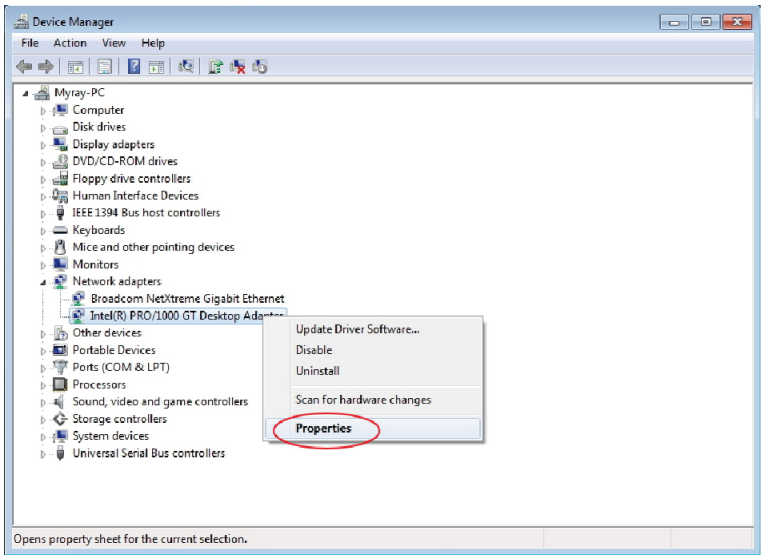
Wait until the service is stopped:

Click on “OK” to close the dialogue window.
From the Windows Services list, search for “Windows update”, stop the service and disable the automatic startup.

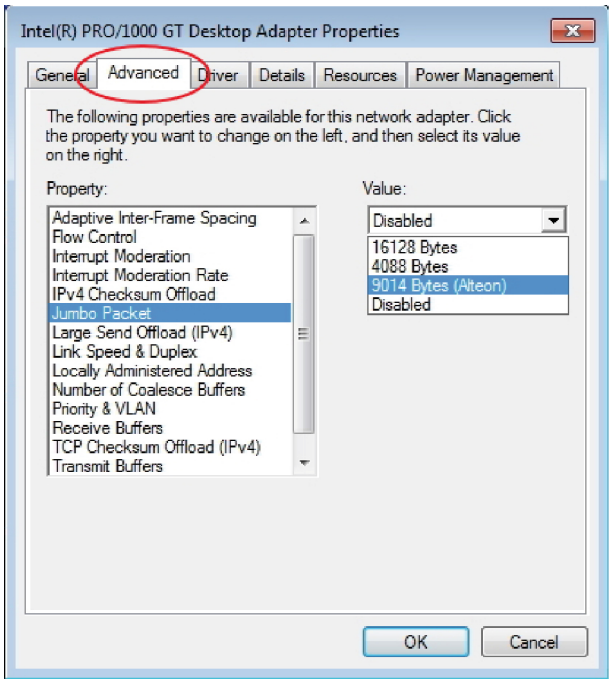
1.2.4. INTEL PRO 1000” NETWORK CARD INSTALLATION



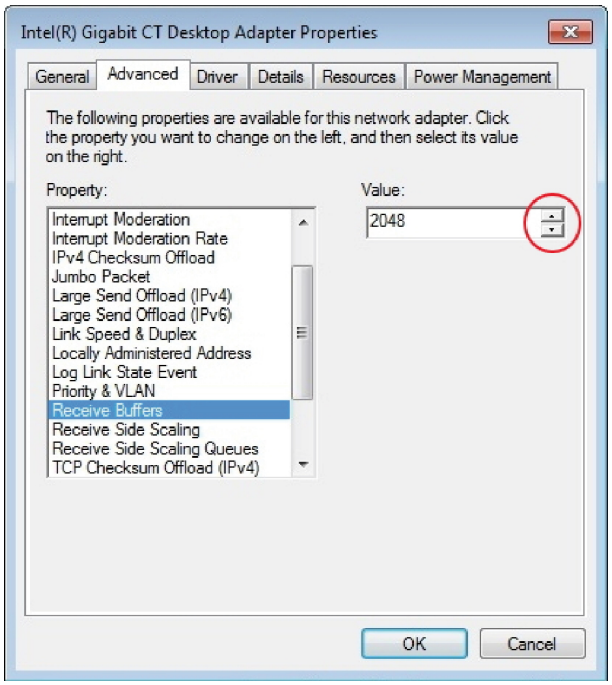
Right click with the mouse on “Computer”, select “Properties” and select “Device Manager” in the left column.



Expand the “Newtork Adapter” group, right click on the “Intel pro 1000”, and select “Properties”.



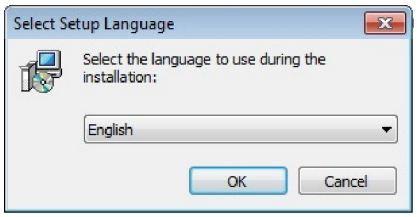
Select the “Advanced” tab, highlight the “Jumbo Packet”, and set it to “9014 byte



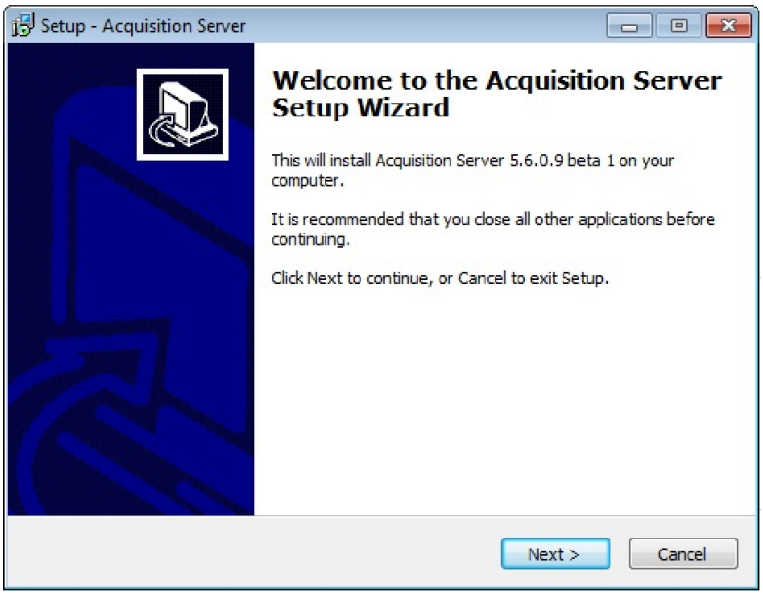
From the “Advanced” tab set the “Receive Buffers” parameter to 2048

WARNING: the “Receive Buffers” parameter migh not show on this window. If not visible, please search for the “Performance options” parameter, click on “Properties” and set the “Receive bufffers” value from there.

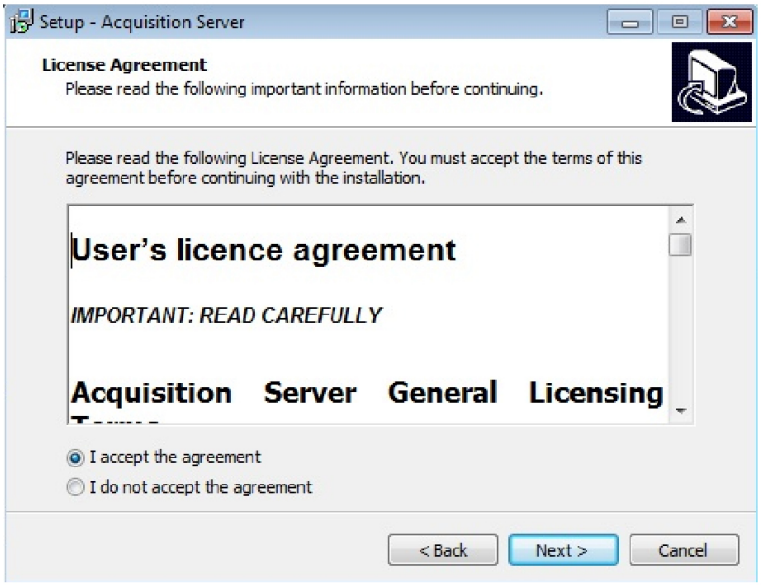
1.2.5. ACQUISITION SERVER” SOFTWARE INSTALLATION



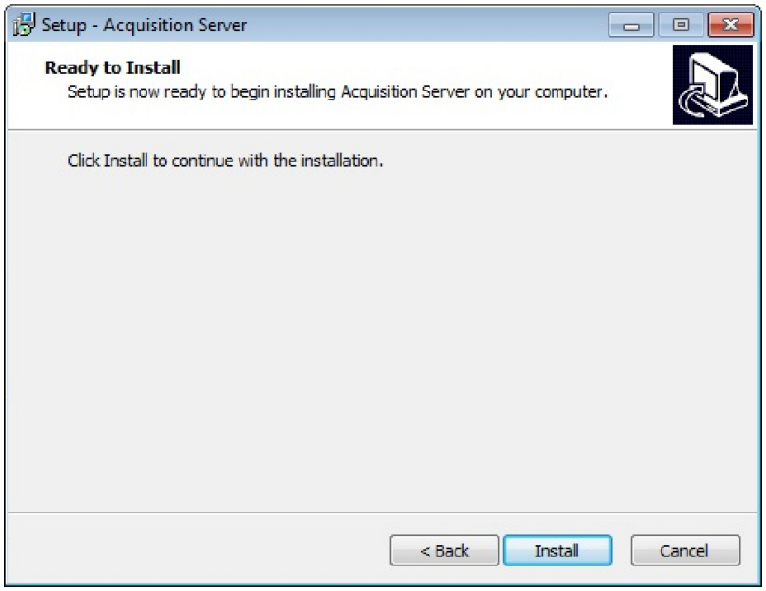
This software can only be installed on 64 bit Operating Systems.
Launch the software installer (from the setup menu on the usb dongle or from Extranet download)and select the language:



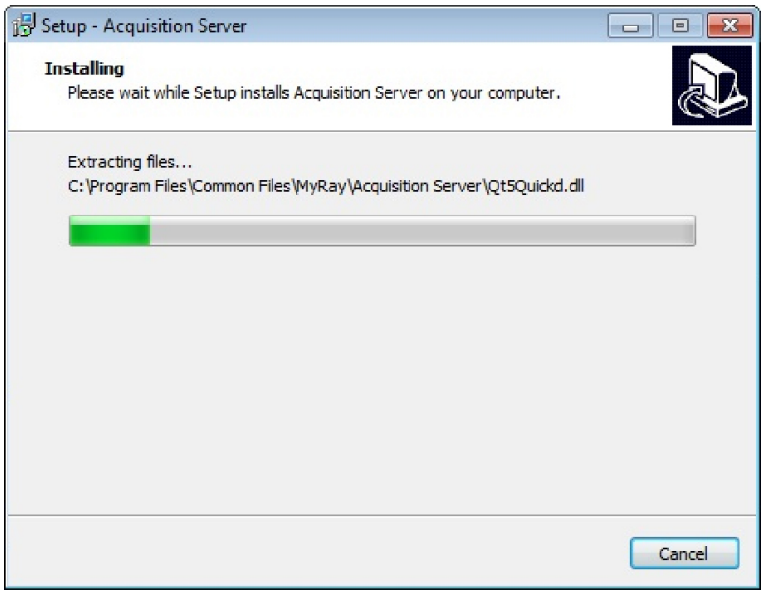
Click on “Next”



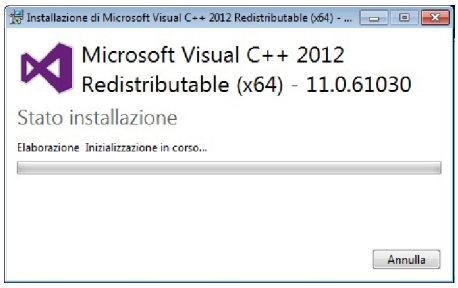
Select “I accept” , then click “Next”



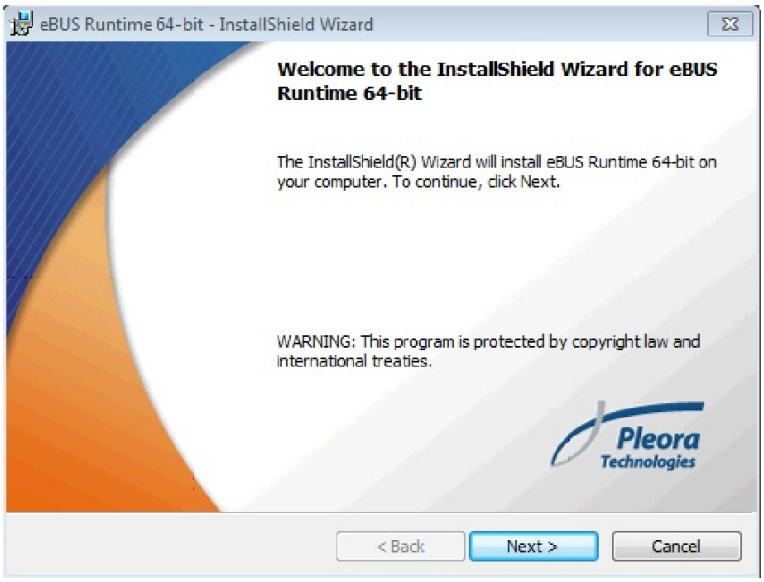
Click on “Install”



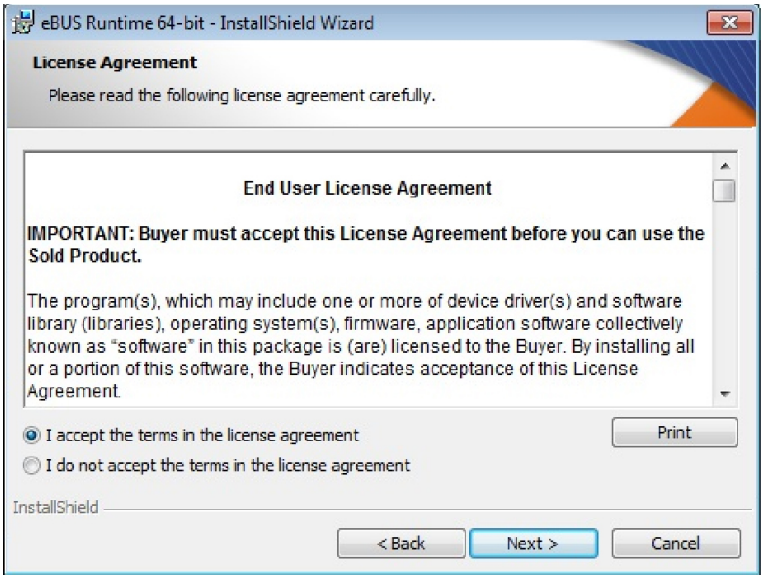
Wait



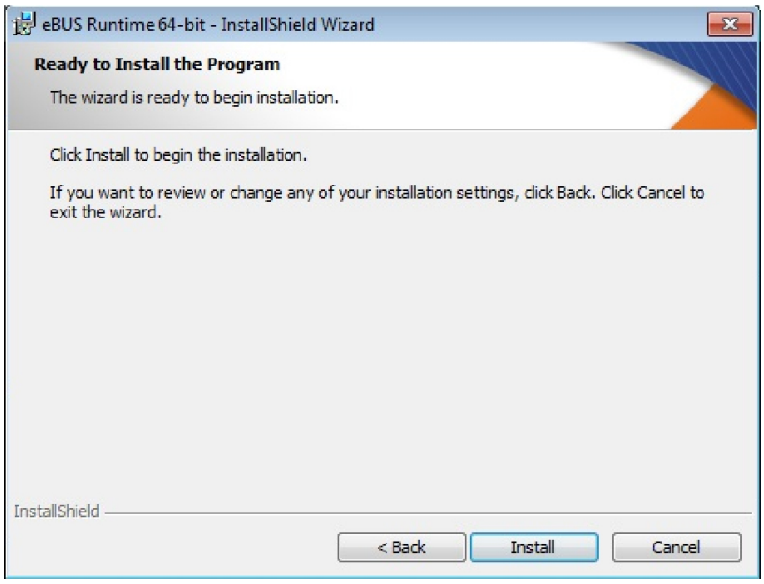
Installed software will be checked, any missing system component will be installed at this stage.



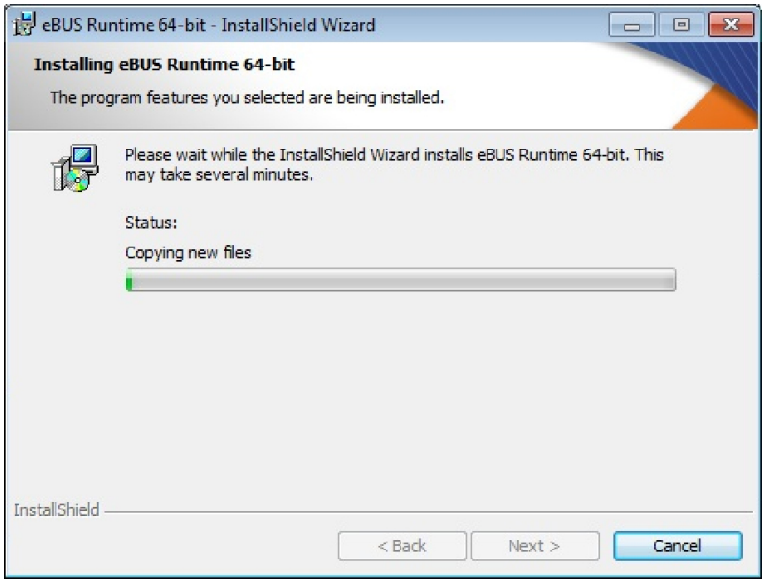
The Pleora driver for the Intel Pro 1000 network adapter will be installed automatically, click “Next”



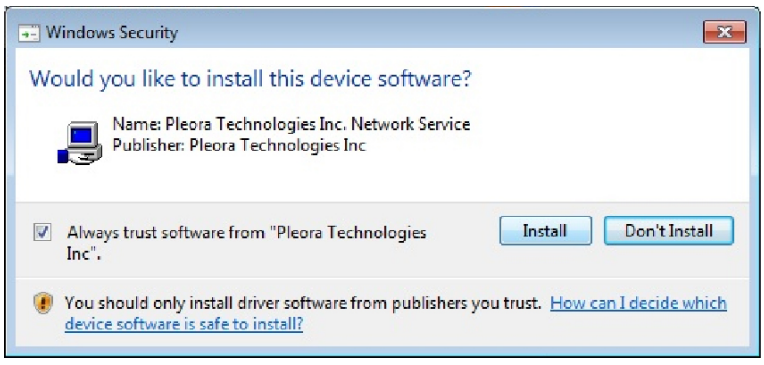
Accept and click “Next”



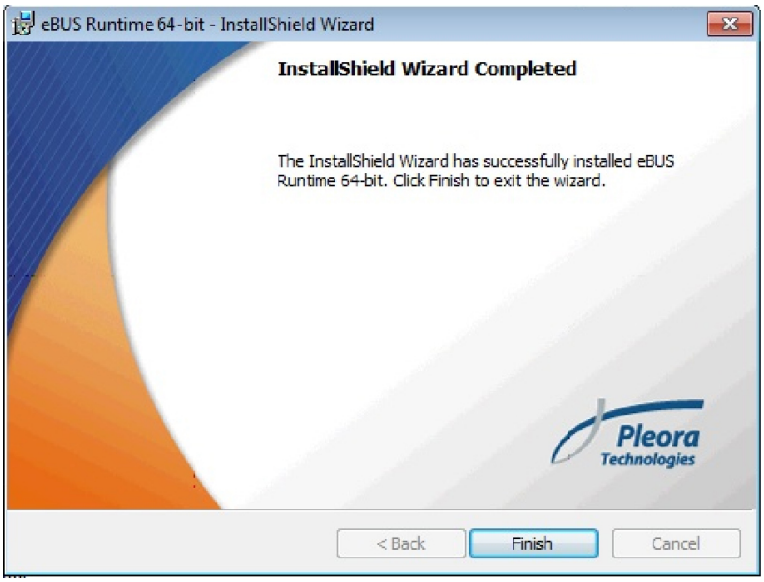
Click on “Install”



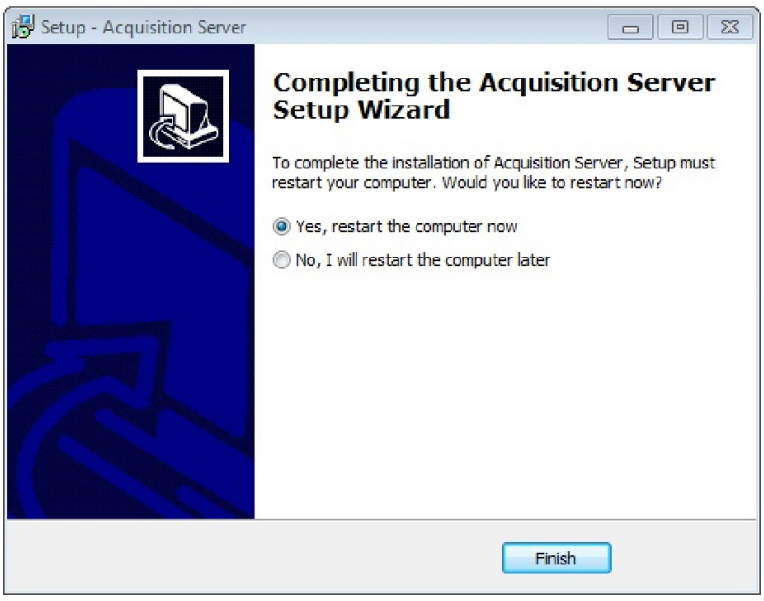
Wait for the driver installation to finish.



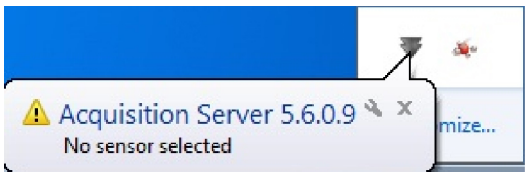
If the following window is displayed, select “Always Trust” and click “Install”



Click “Finish” at the end of the installation.



Restart the PC

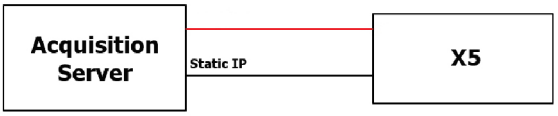


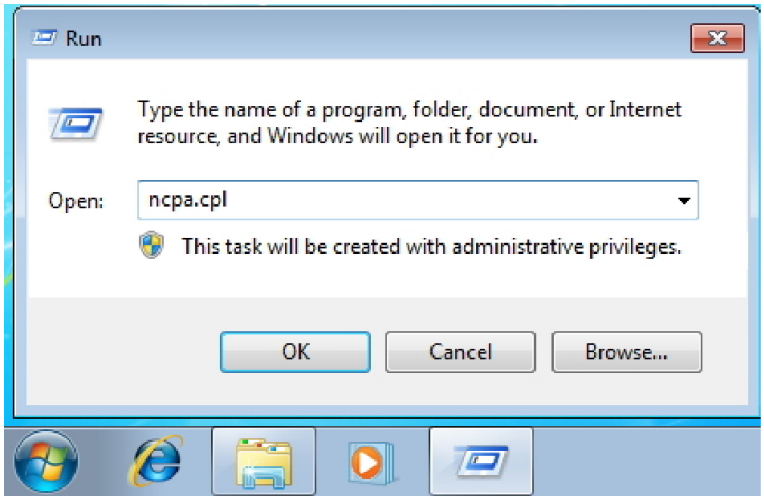
The “Acquisition server” software will start up automatically and will be accessible from the system tray.

1.3. CONNECTION AND CONFIGURATION

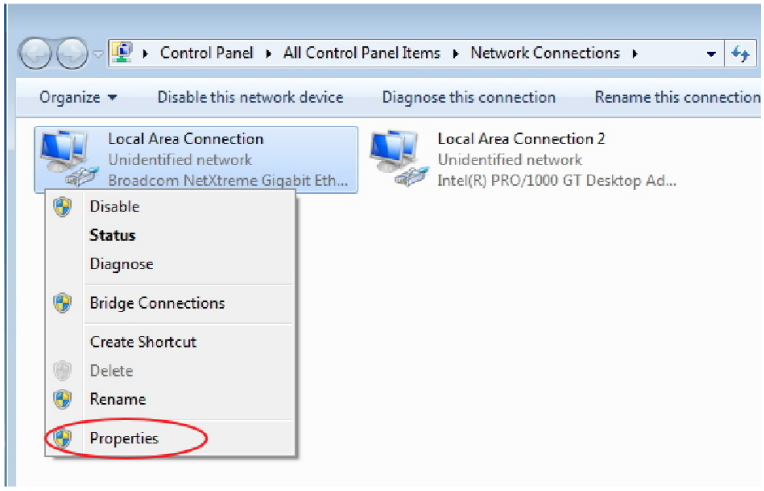
1.3.1. SOFTWARE ACQUISITION SERVER

hyperion X5 can be connected to a LAN or direclty to the Acquisistion server PC. Either way, the image detector must be connected directly with a point-to- point connection to the Acquisition Server PC.
The direct connection between the image detector and the PC is managed automatically by the software, there is thus no need to set the IP address on the detector for the connection to be estabilished. The Intel Pro 1000 always stays configured as from system default (DHCP) and the connection is managed automatically.
It could be necessary to set up a static IP address for the network adapter used for the PC to hyperion X5 system communication. If this network adapter is directly connected to the unit, the IP address for the PC should be set to one in the same subnet as the hyperion X5's default (e.g.192.168.1.150)

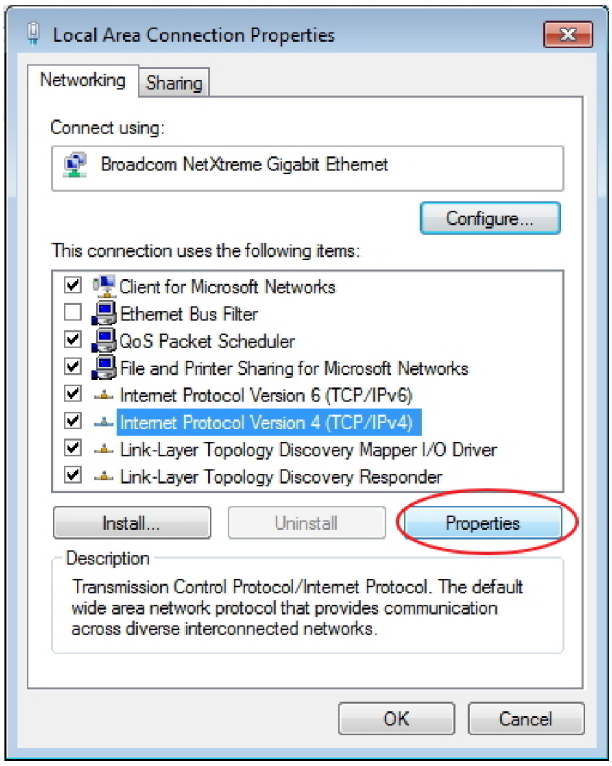




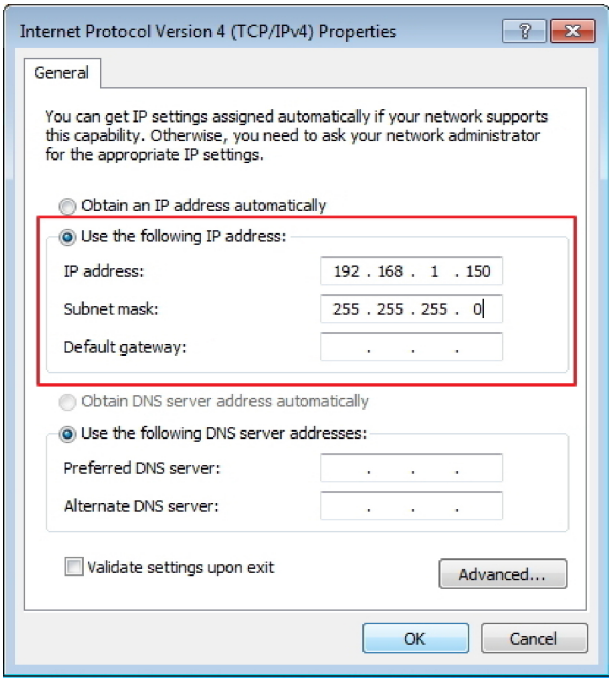
To set a static IP address on a network board it is necessary to click on the Start button, type “ncpa.cpl” and press Enter. The Network connection window will open:



If it is necessary to give the communication network board a fixed IP address , right-click with the mouse on the relative connection (not the INTEL pro 1000 one, the one supplied by the other network board) and select “Proprieties”.



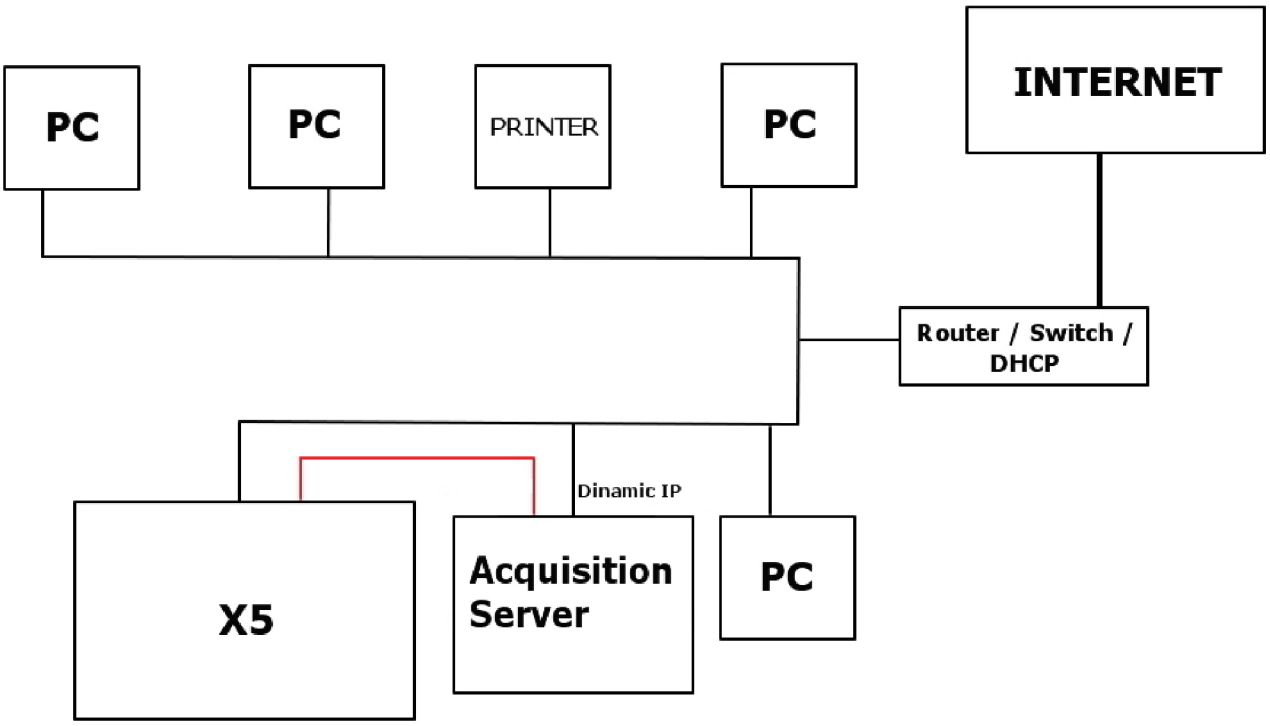
Select “Protocol internet version 4 (TCP/IPv4)”and click on “Properties”.

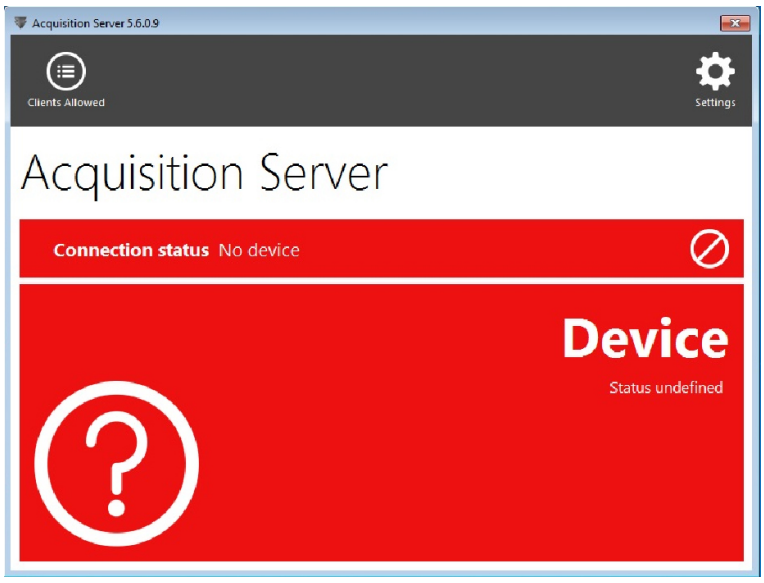


Specify an IP address compatible with the one of the X9. In the “IP Address” field, type an address as 192.168.1.XXX where XXX can be a digit included between 1 to 254, with the exception of the X9 default IP (usually 160). The Subnet mask will be automatically filled.

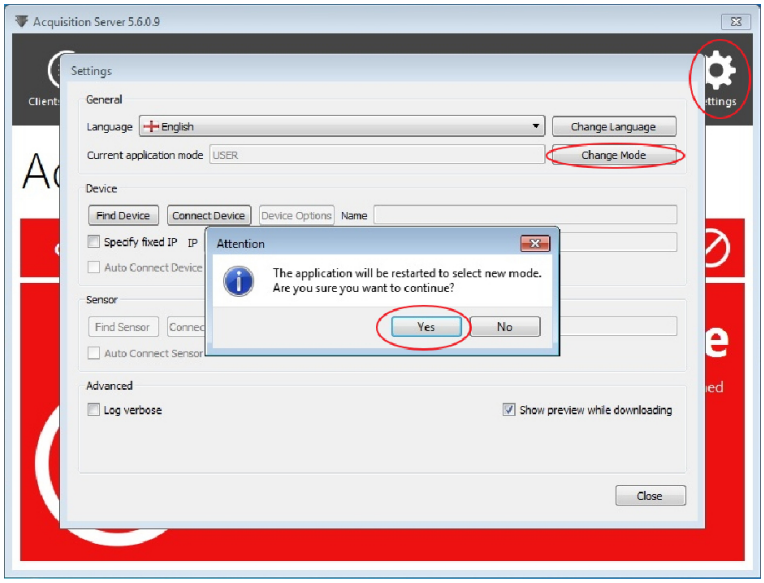
Confirm by pressing the “OK” button.

If the unit is connected to a LAN with DHCPC (as in the following diagram) then the noetwork adapter should be set to “Obtain IP address automatically”. The DHCP server will assign correct IP addresses to both the hyperion X5 and the acquisistion server.

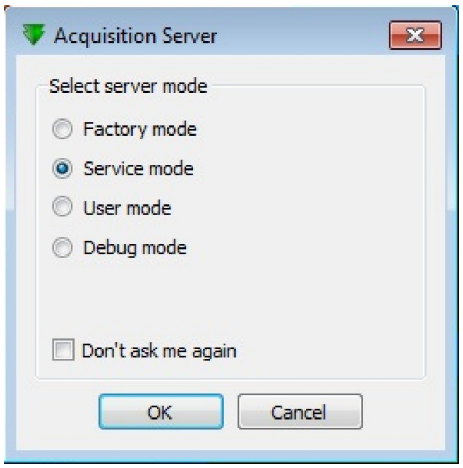




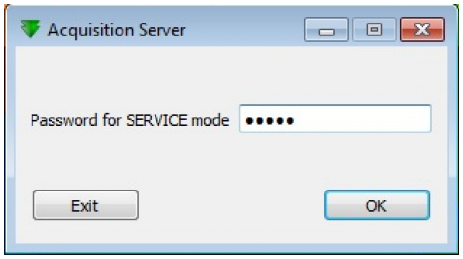
Once the IP addresses have been configured correctly you can start setting up the Acquisistion Server software.
Click on the Acquisition Server icon in the system tray, the main window will be magnified in “User” mode.



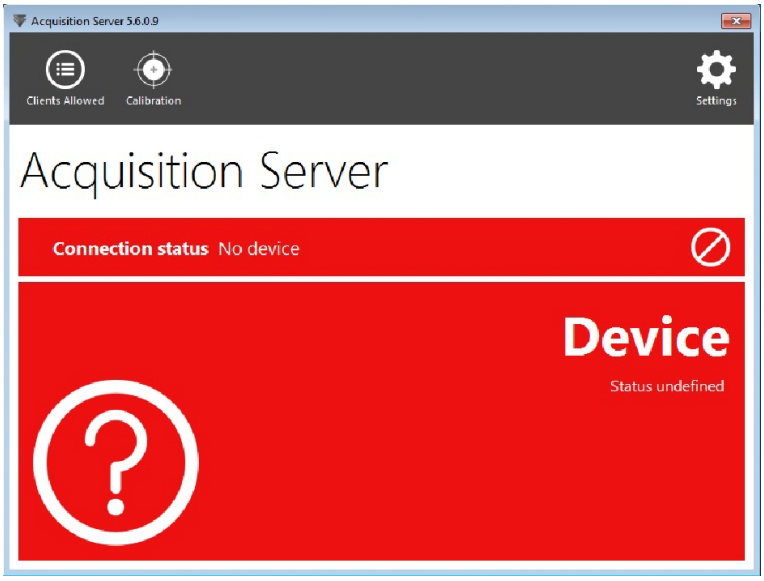
The topmost red area represents the connection status and the sensor status. The lower red area is used for diagnostics and reporting error messages.
Click on the “Settings” icon on the top left corner. The connections and options panel will open up. Select “Change mode” and confirm the application restart request.



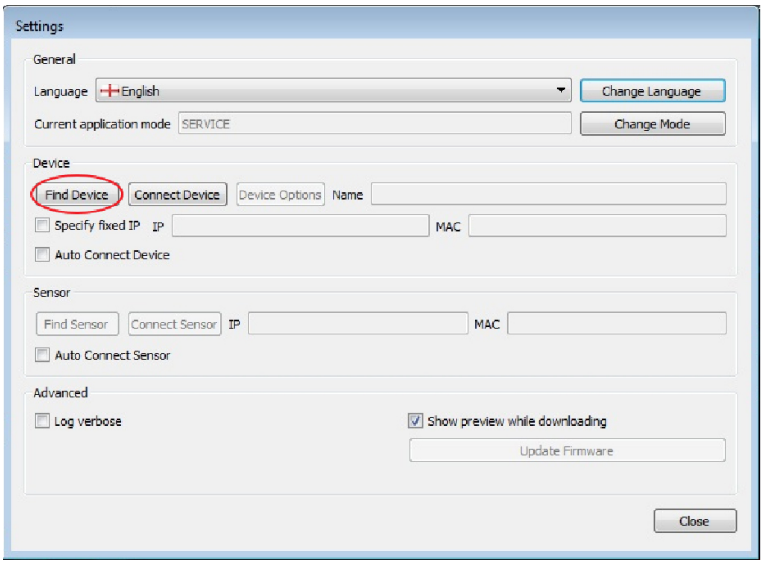
On program restard you'll be prompted to select the application mode. Select “Service mode”.



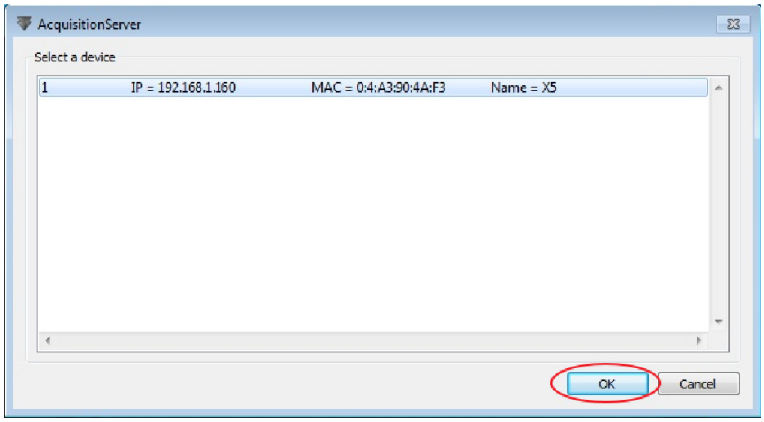
enter the password “cefla”.



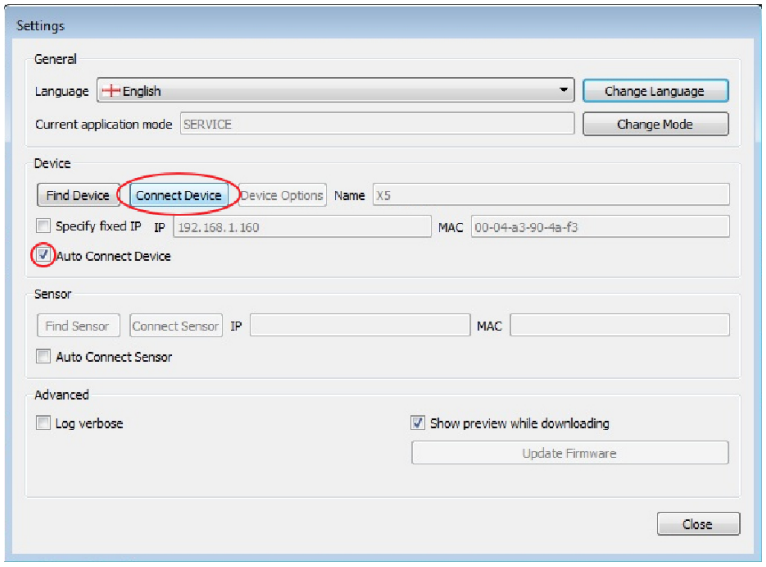
Restart the “Acquisition Server” software, now in “Service mode”.



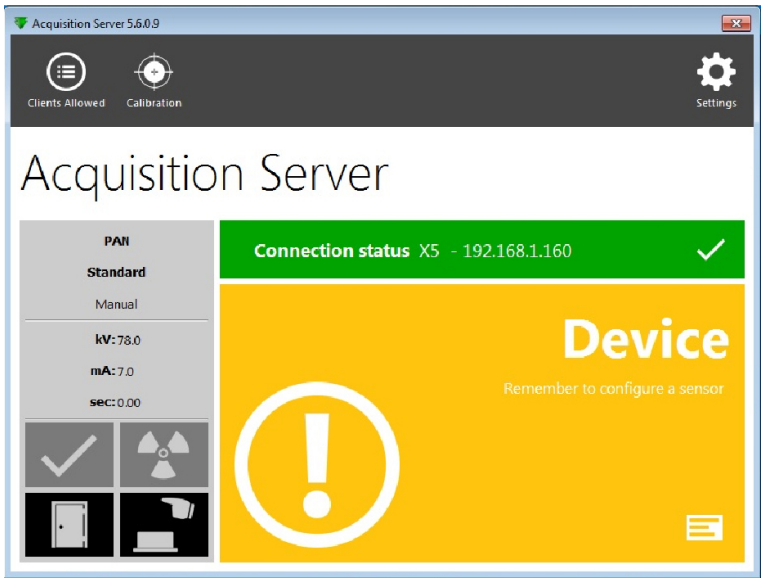
Click on “Settings” and select “Find Device”.



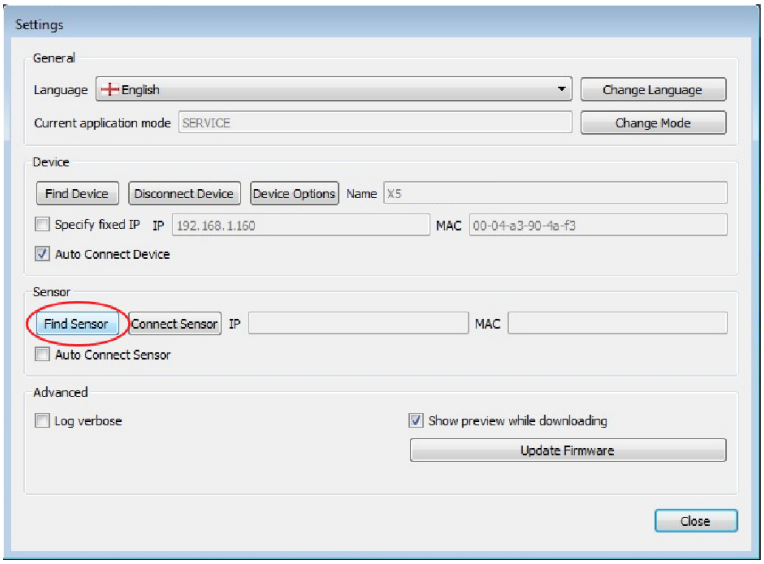
hyperion X5 X5 will be found, select the line and continue.



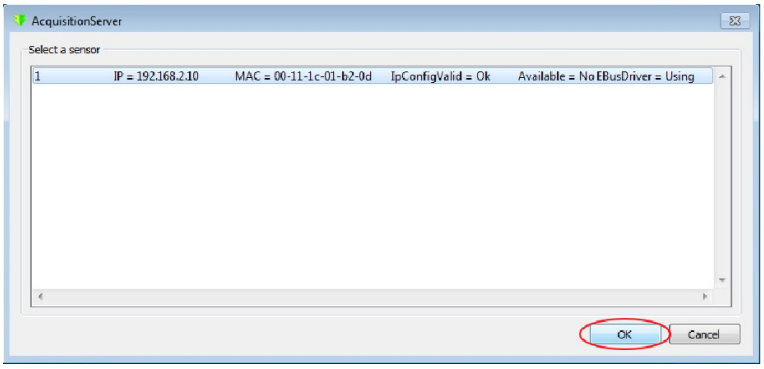
Select “Connect Device” and activate the “Auto connect device” option. Click on “Close”.



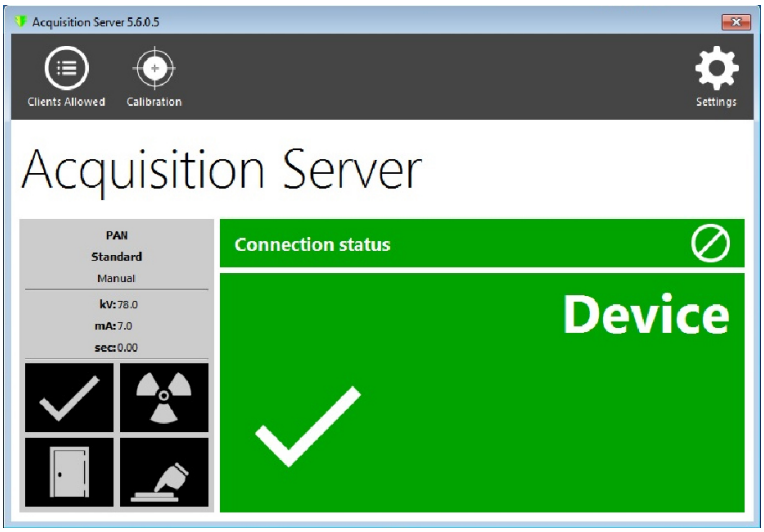
In a few seconds the connection to the hyperion X5 will be estabilished.



Now the link to the image detector needs to be estabilished. Click on “Settings” and then on “Find Sensor”.



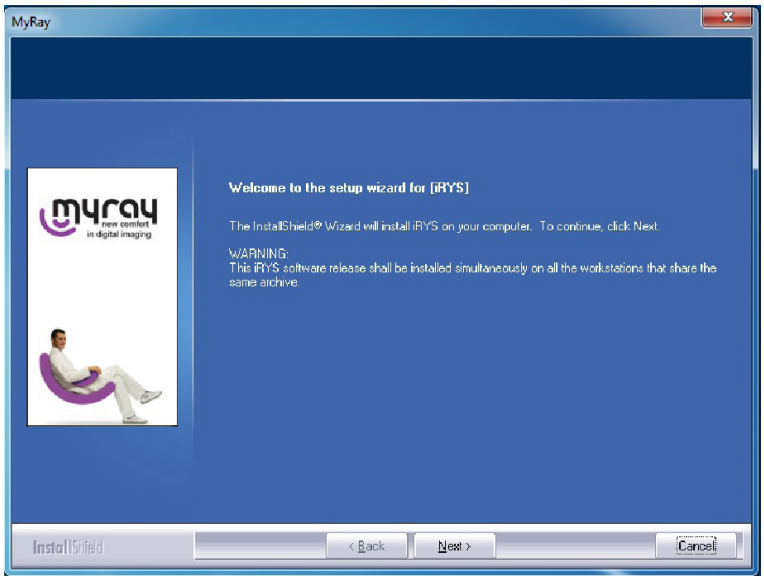
The image detector will be detected automatically. Select the line and confirm by clicking “OK”.



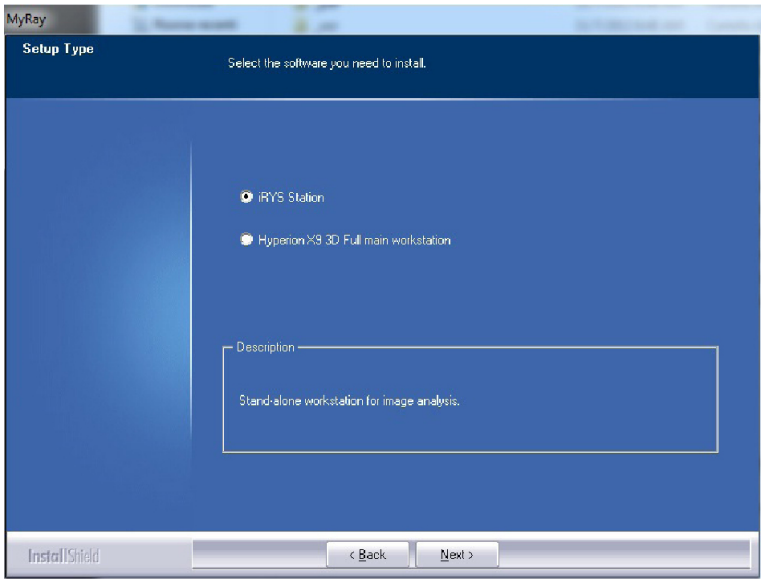
The acquisistion server should show full green status now:

1.3.2. IRYS INSTALLATION AND CONFIGURATION

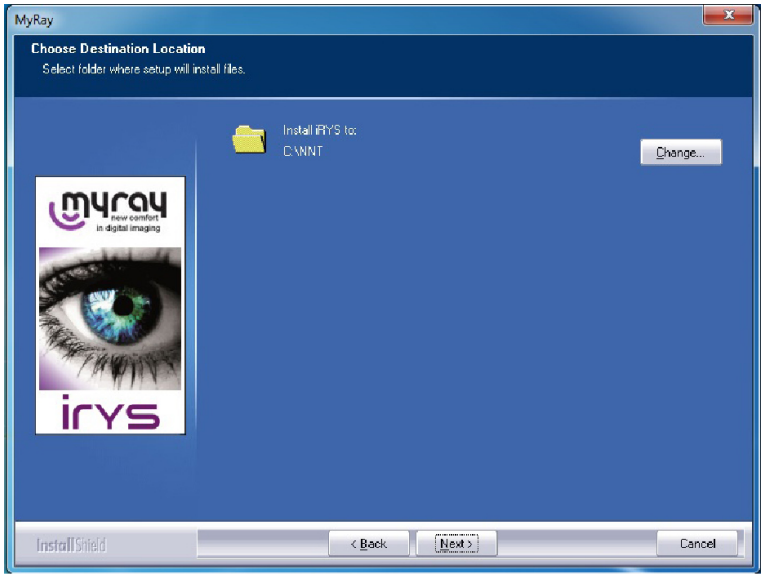
The imaging software used with Hyperion X5 is “iRys” (version 5.5 or later), installed in “Station” version.
It is not strictly necessary to install iRys on the Acquisistion Server PC, iRys can be installed on any PC in the network that could communicate with the Acquisition Server PC.



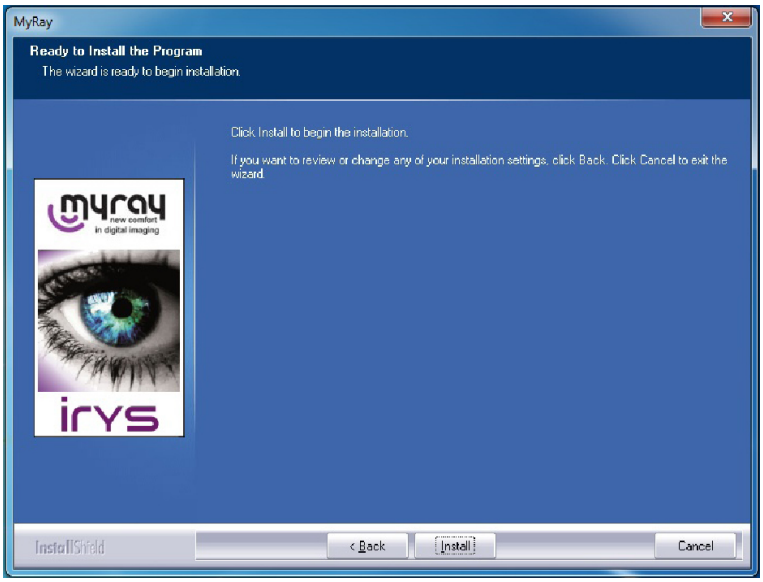
Load the Irys installation CD and follow the instructions on the screen.



Select “IRYS Station” installation:



Continue by confirming the installation path:

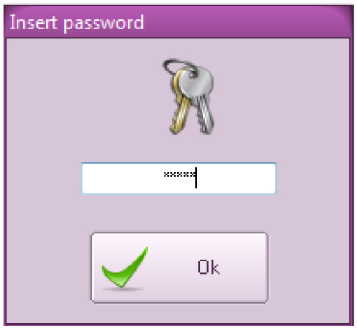


Click “Install”:

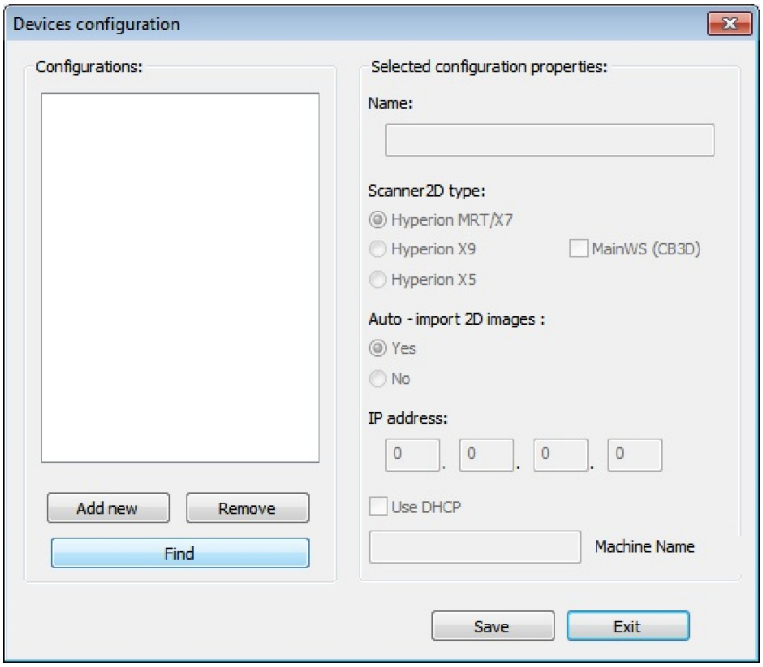
Click ok to confirm.



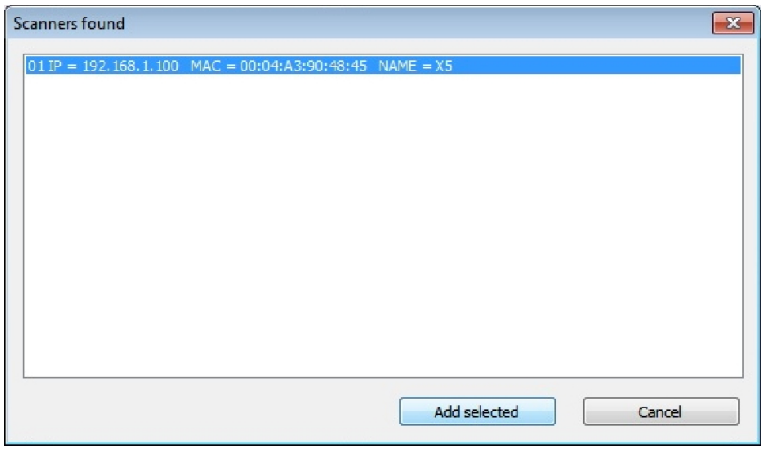
To connect the hyperion X5 to iRYS, start iRYS and press “CTRL + ALT + SHIFT + FINE” simultaneously to access the
service level of the program, confirmed by the message in the bottom right-hand corner:

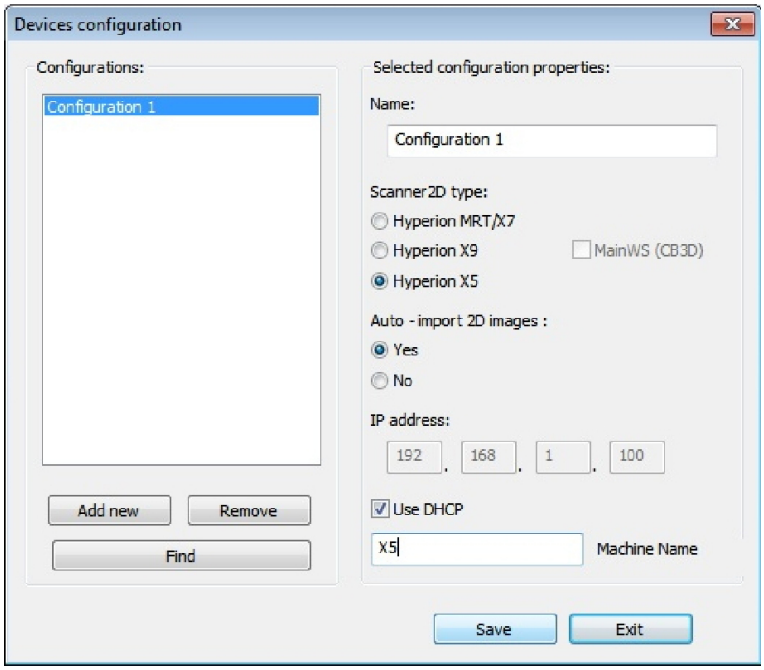


Now press “ALT + F10” and type the password “12345” to access the device configuration panel:



By clicking on “Find” the PC running the Acquisition Server software will be detected.
WARNING: iRys connects to the Acquisition Server software and not to the hyperion X5 directly, so the IP address shown in this window is not the hyperion X5 IP address, but the Acquisition Server PC address.
Select the line and confirm.

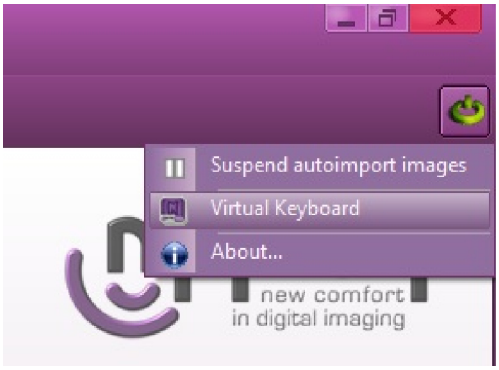




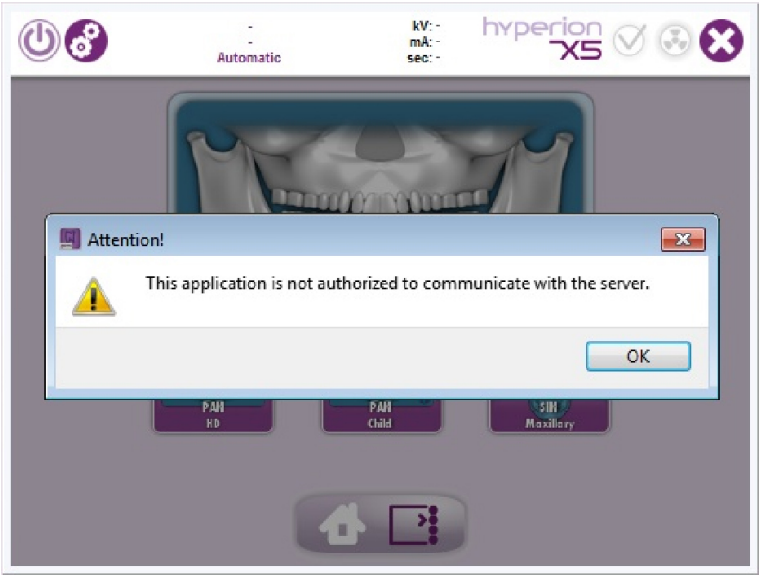
Configure the remote connection as shown in the image here below. Click “Save” and then “Exit”.



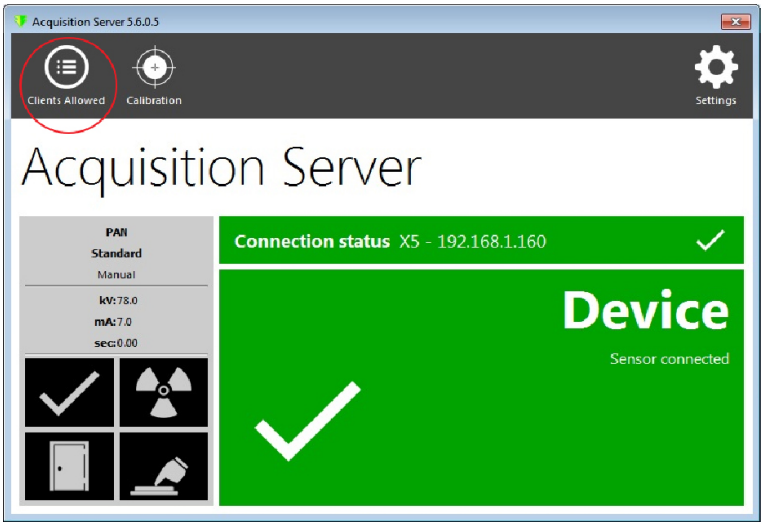
The .hyperion X5 connection status icon will appear in the upper right corner of iRys' interface.



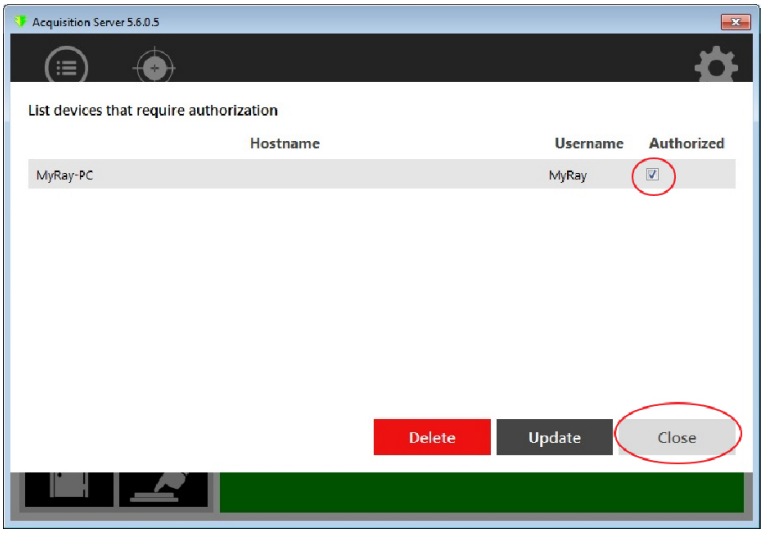
Click on the icon and select “Virtual keyboard”:



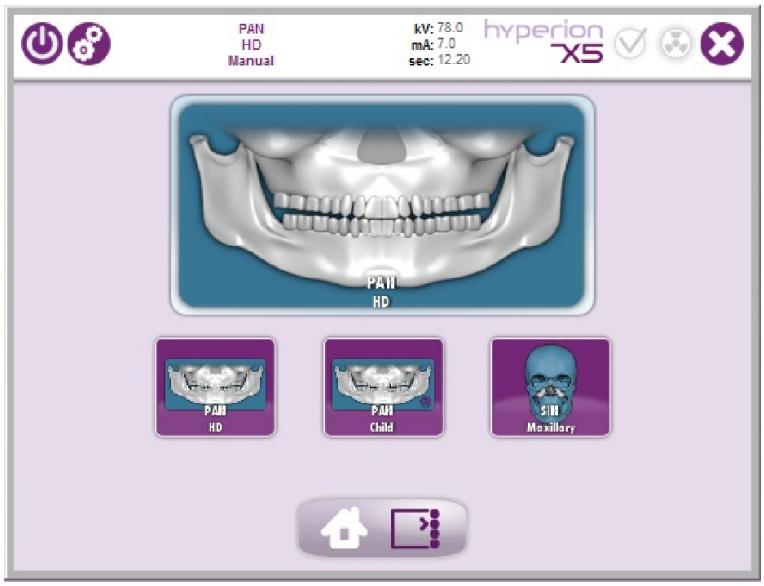
On first startup the console will prompt with this message:



In order to authorize the virtual keyboard to connect to the unit, you need to enter the "Acquisition server" software and select "Clients allowed":



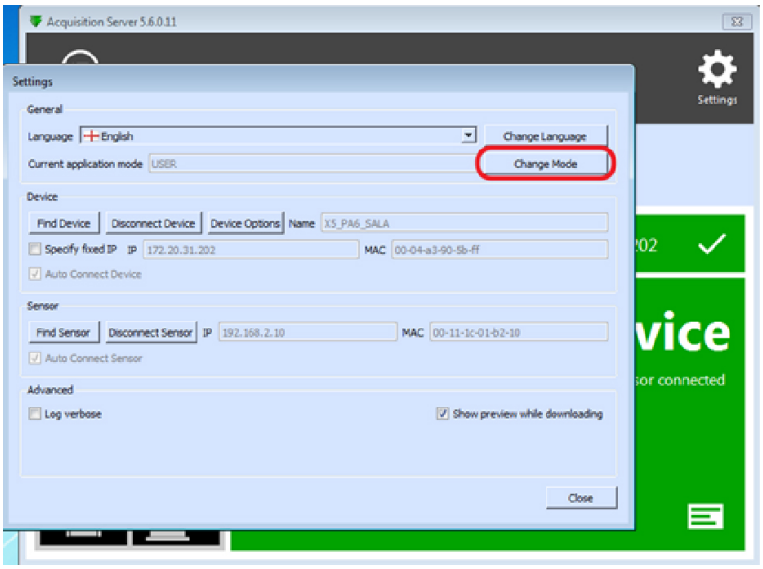
The clients list will appear, select the appropriate one and close the window.



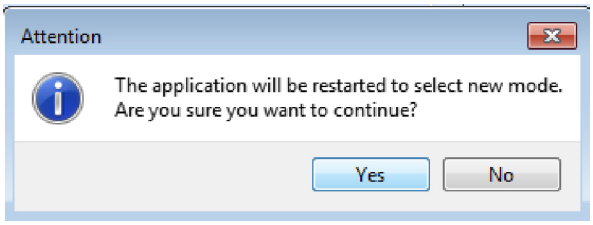
Now the .hyperion X5 virtual keyboard will connect correctly:

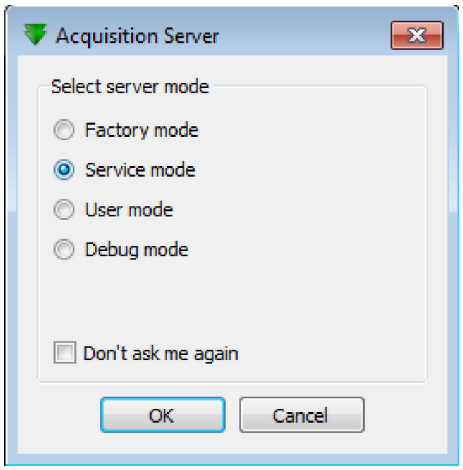
2. CALIBRATION

2.1. PRELIMINARY OPERATIONS

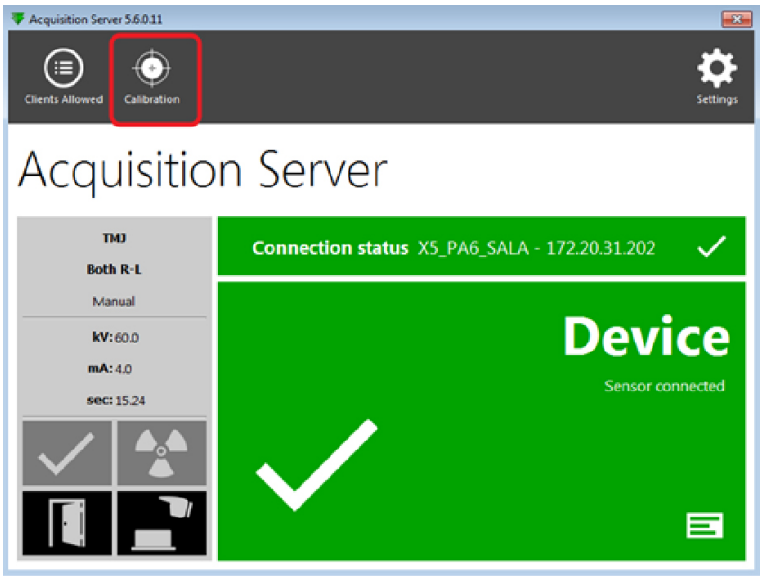


Open the acquisition server software, click on “Settings”, then on “Change Mode” and confirm when prompted.



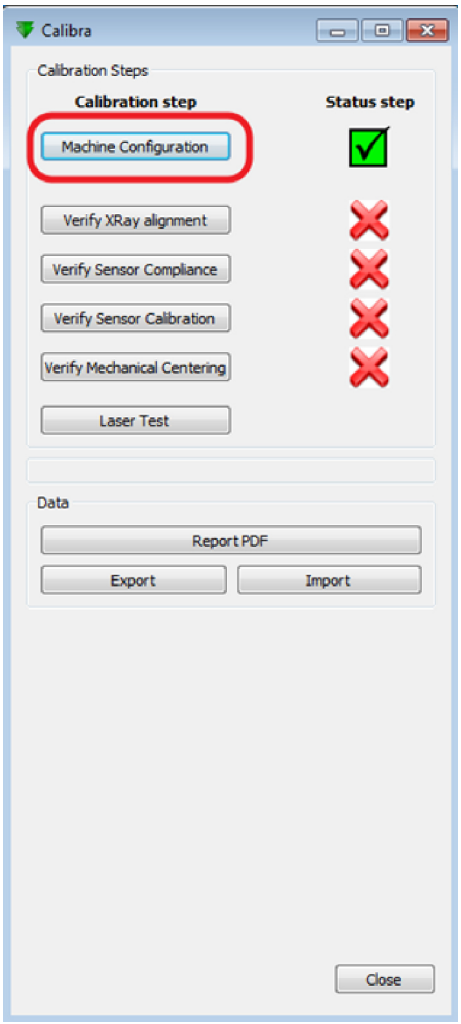


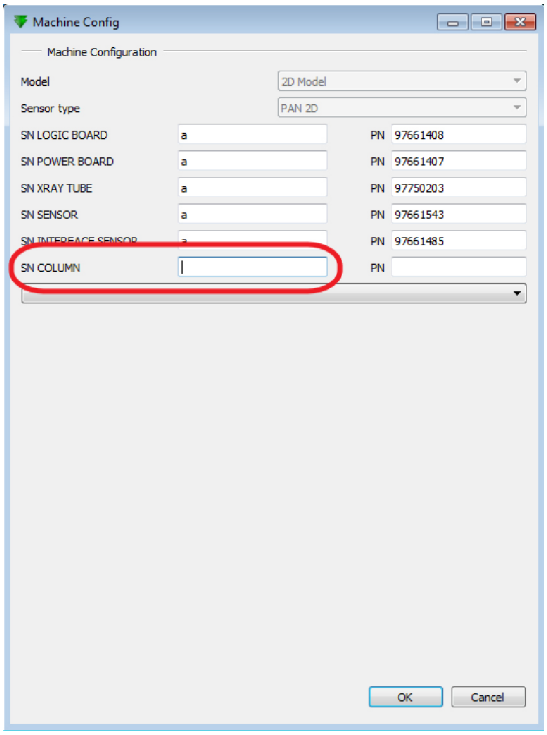
Select “Service mode” and enter the password “cefla”.



Open the Acquisistion server software and click on “Calibration”.

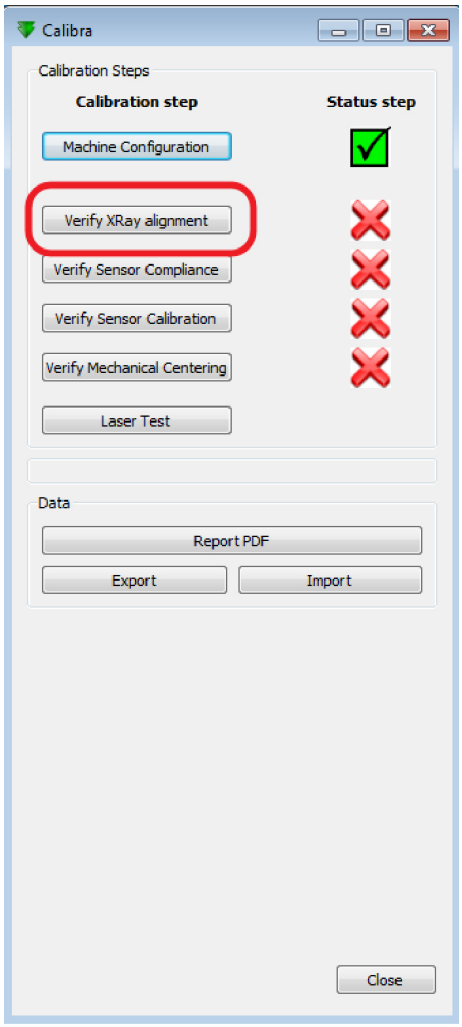
2.2. DEVICE CONFIGURATION



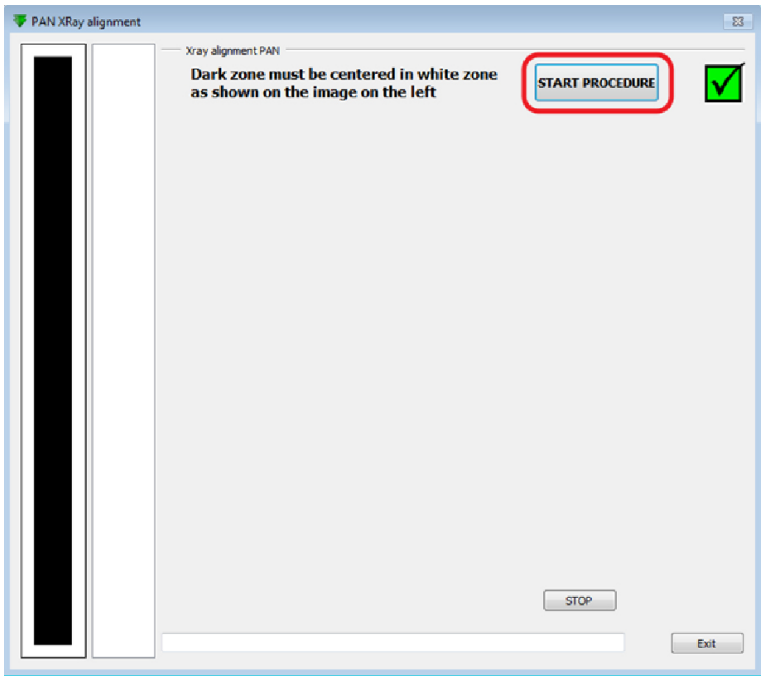


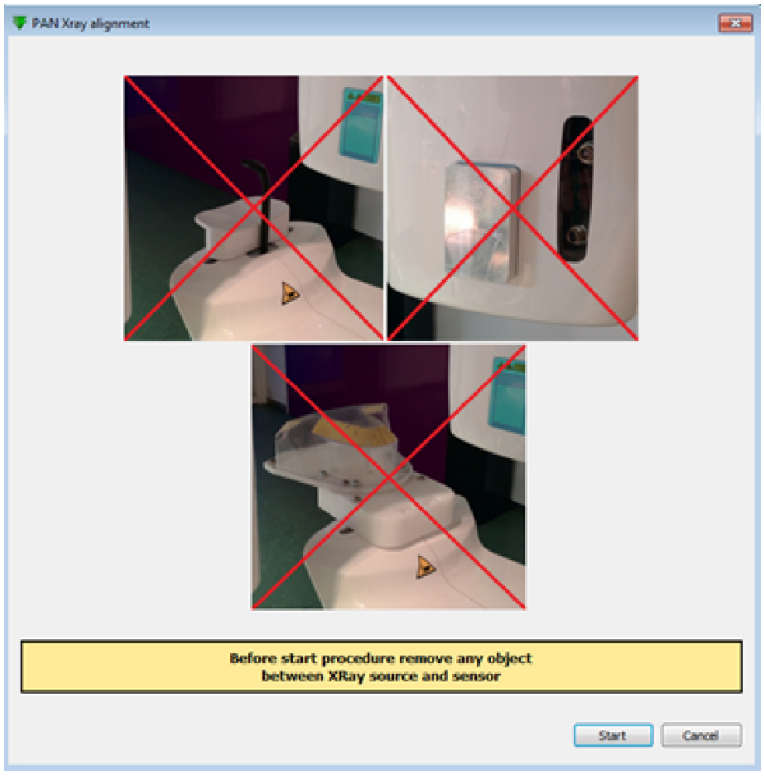
Enter the serial number of the column in the textbox and presso “OK”

2.3. XRAY ALIGNMENT



A correct alignment should result in an image like the example shown on the left side of the window (dark rectangle with white background); click on “Start procedure”.

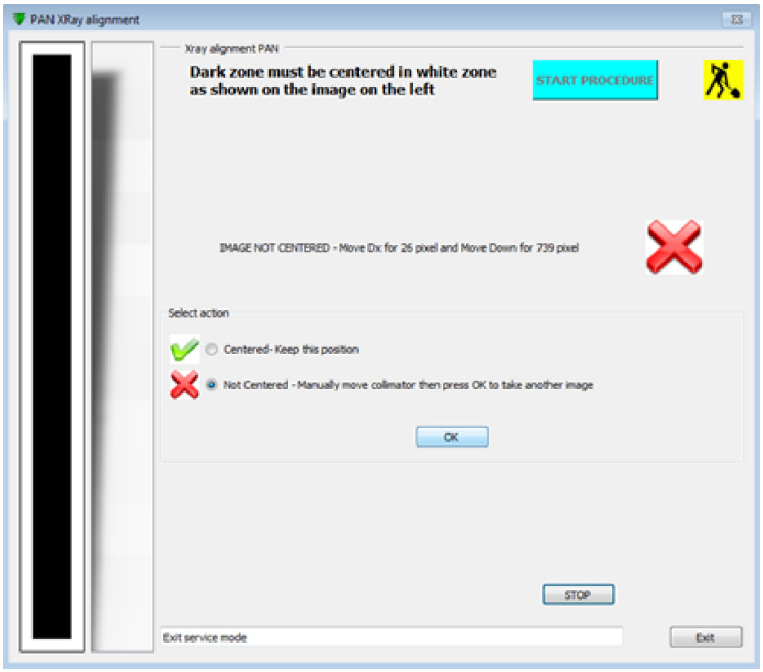




Make sure to remove every object from the scan area (bite support, chin support, aluminum filter, calibration phantom)



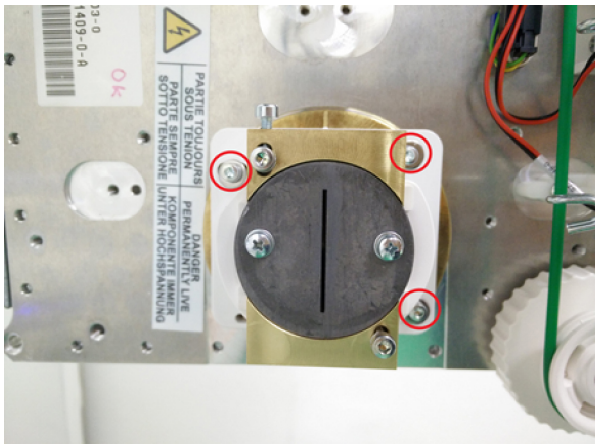
Press the exposure button when required, hold until asked to release.



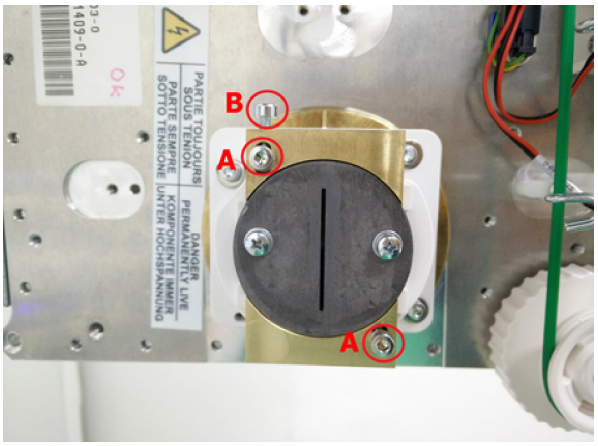
If the resulting image is not centered (like the one in the following picture), the collimator needs to be manually moved.



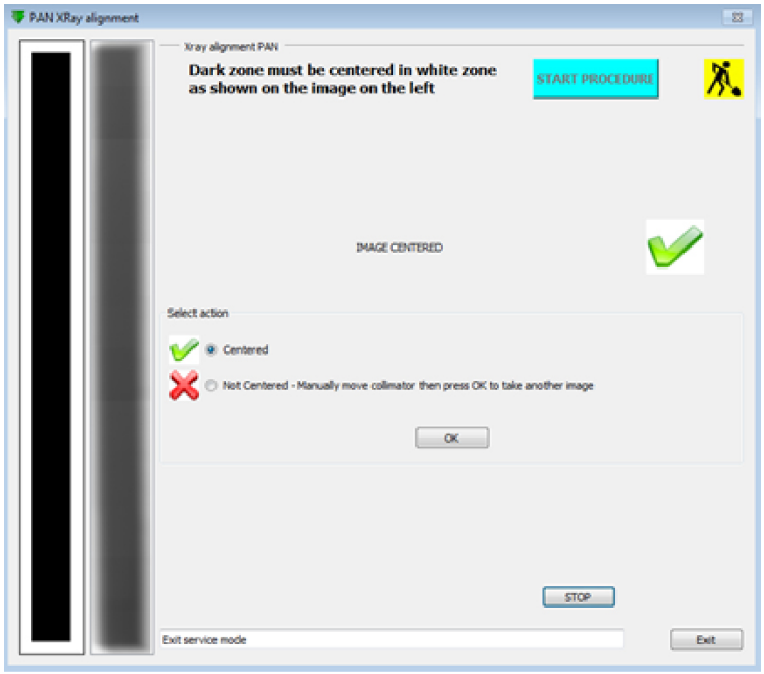
Remove the screws shown below to in order to remove the front cover of the generator.



Centering the collimator horizontally or rotating it
Slightly loosen the screws shown in the following picture, then move the collimator horizontally and/or rotate the whole white plastic assembly if required. Tighten the screw before taking the next image.

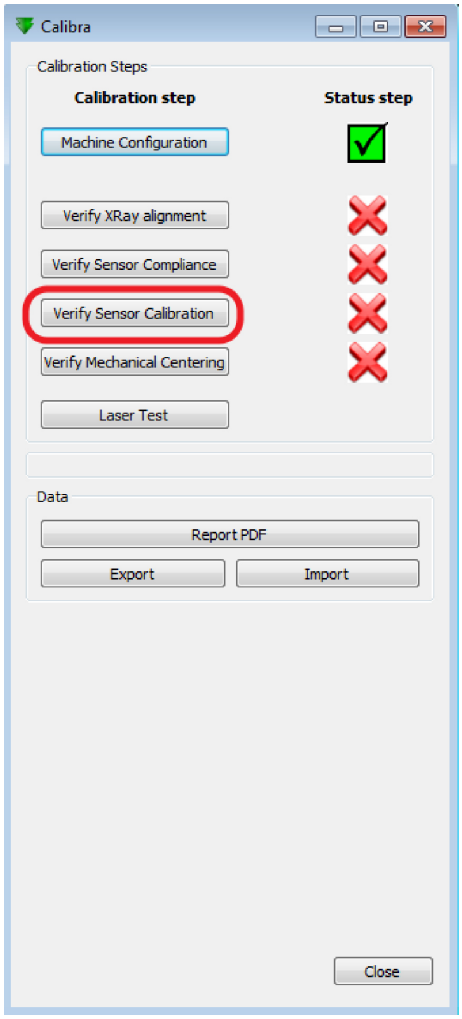


Select the “not centered” option in the calibration tool, then presso “OK” to start a new acquisition in order to verify the change made.
Repeat the procedure until the x-ray beam is correctly aligned.
Centering the collimator vertically
Slightly loosen the “A” screws shown in the following picture, loosen or tighten the “B” screw to move the collimator up or down. Tighten the “A” screws before taking the next image.



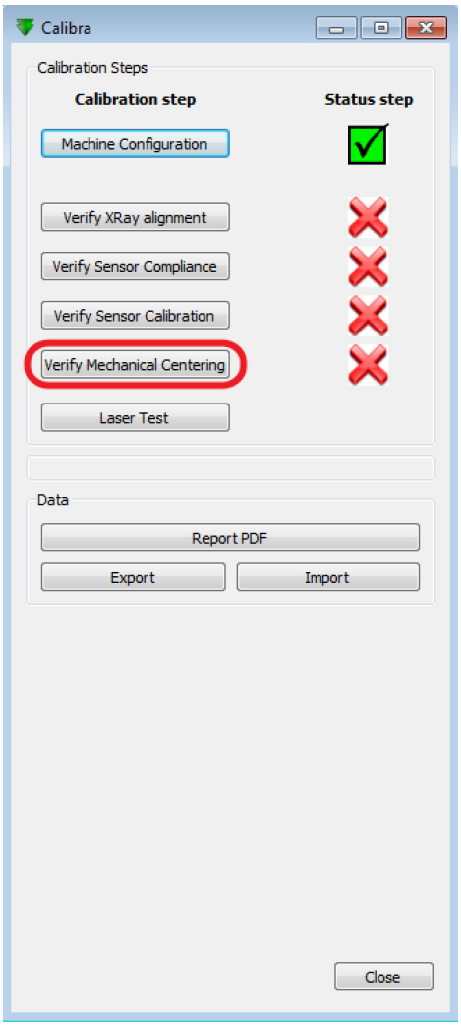
Select the “not centered” option in the calibration tool, then presso “OK” to start a new acquisition in order to verify the change made.
Repeat the procedure until the x-ray beam is correctly centered.
When the x-ray beam is centered, select “Centered” and click “OK”.

2.4. VERIFYING THE SENSOR CALIBRATION

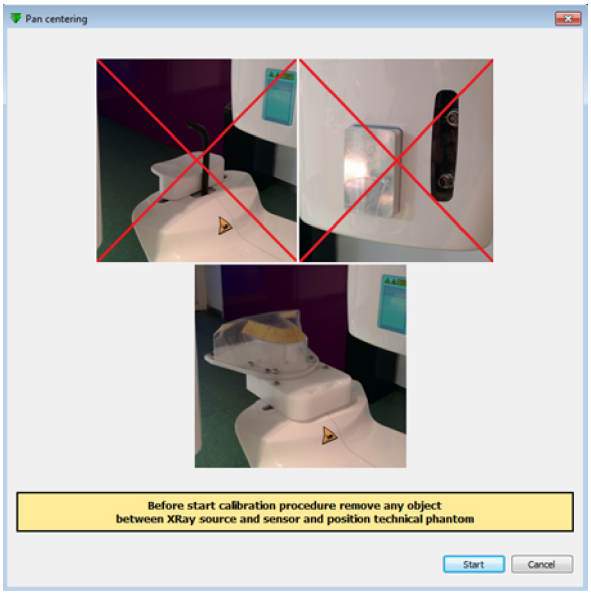


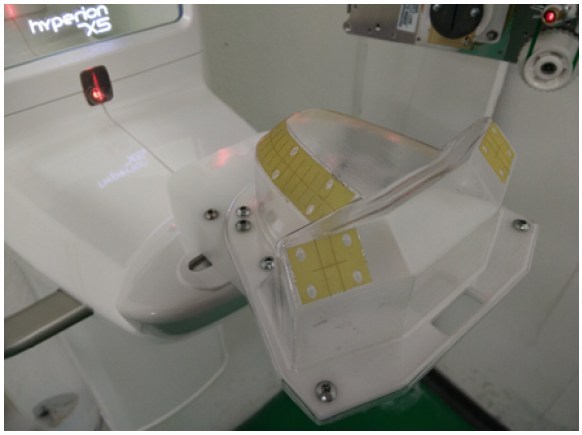
Click on “Start procedure”, make sure to have positioned the aluminum filter on the front cover of the generator and to have removed every object from the scan area (bite support, chin support, calibration phantom)
The unit will automatically emit x-rays, performing 26 exposures. At the end of the procedure, perss “OK” to complete this step.

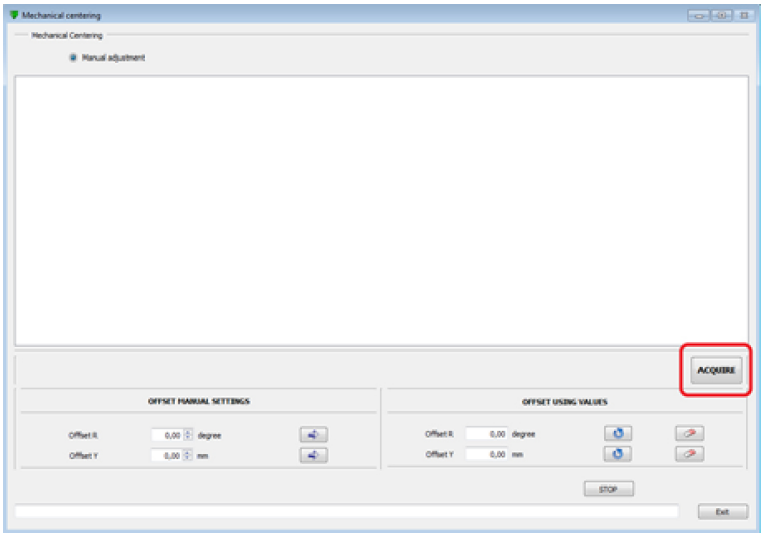
2.5. VERIFYING THE MECHANICAL CENTERING



Remove the bite support, chin support and aluminum filter. Mount the calibration phantom inserting the supporting pins into the holes previously used for the chin support.



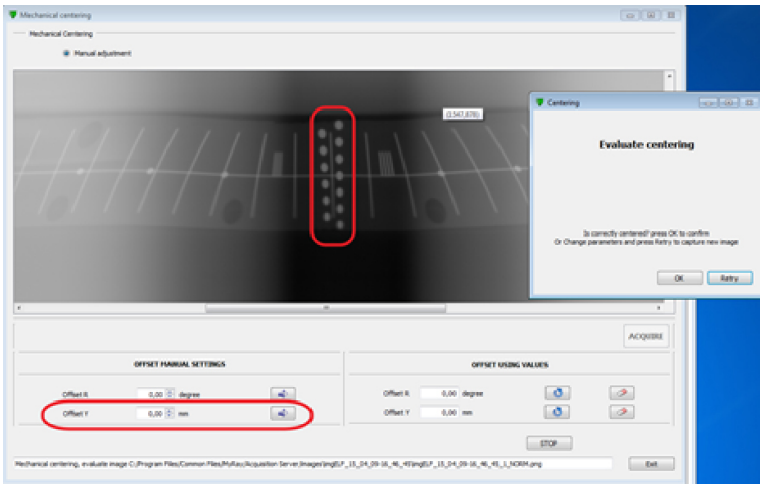




Click on “Acquire”.

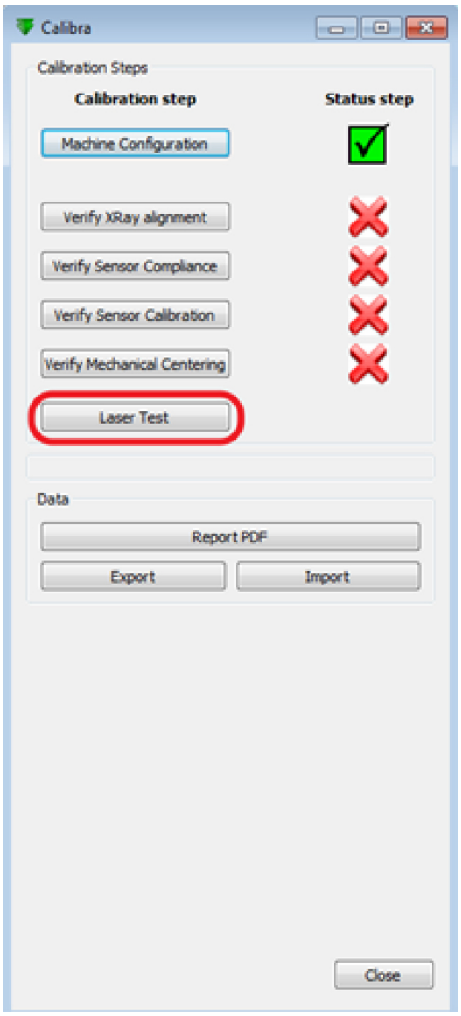


Press the exposure button when required, hold until asked to release.



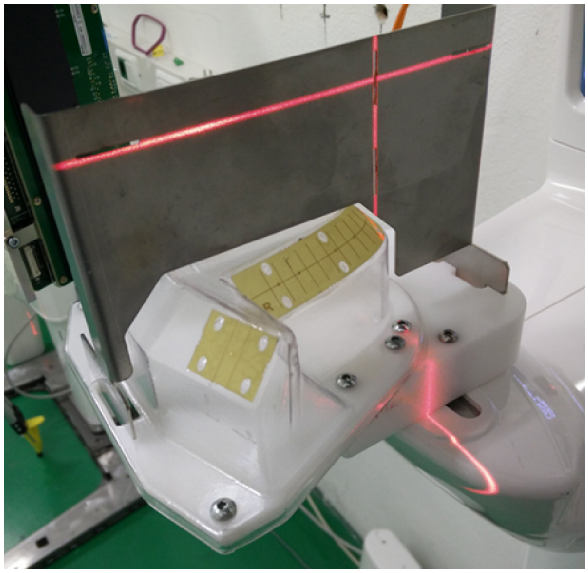
The calibration software will download a complete panoramic image and will show it on screen. You'll need to verify that the focal area is centered. Use the dots as reference. The numbero of blurred dots above and below the central line should be the same.
In case the focal area is not centered, modify the “offset Y” value, click on the arrow and then on “Retry”.
Click “OK” to confirm once the focal area is centered.

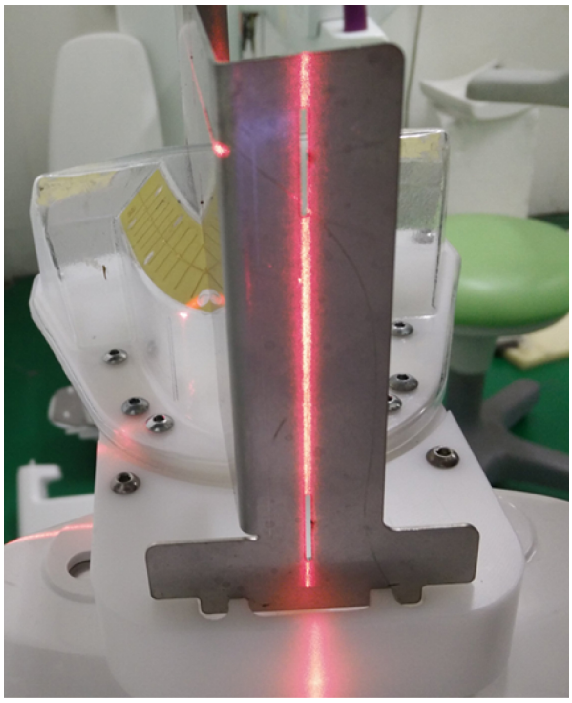
2.6. TEST LASER



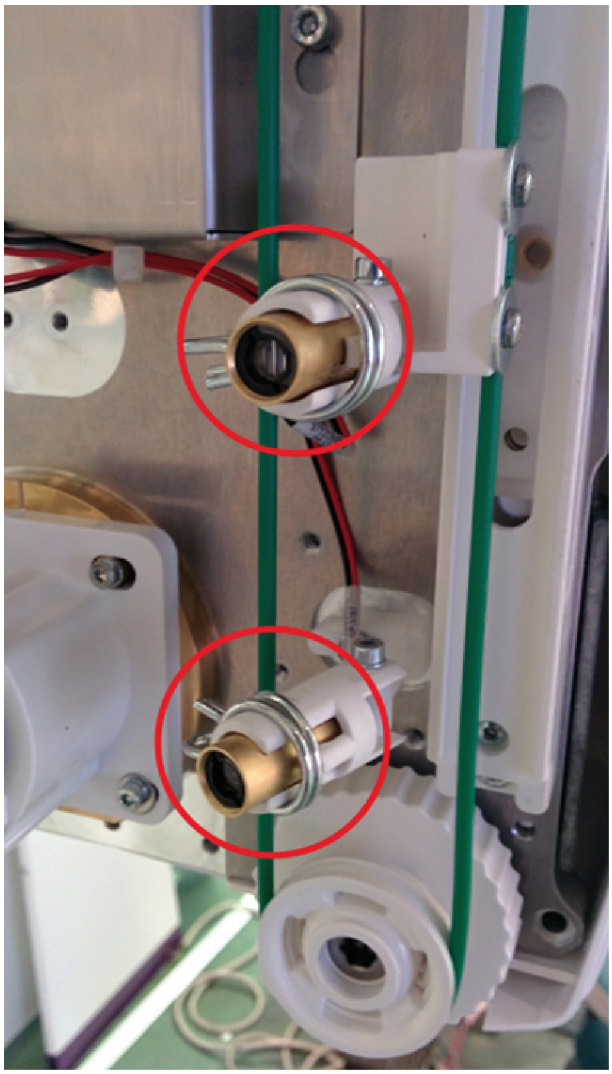
Mount the laser guide tool on top of the calibration phantom (as shown below) and press “Start test”.







The unit will rotate into position for the laser test. Check the alignment of the beams (sagittal, canine, and frankfurt plane) with the reference marks on the test object.



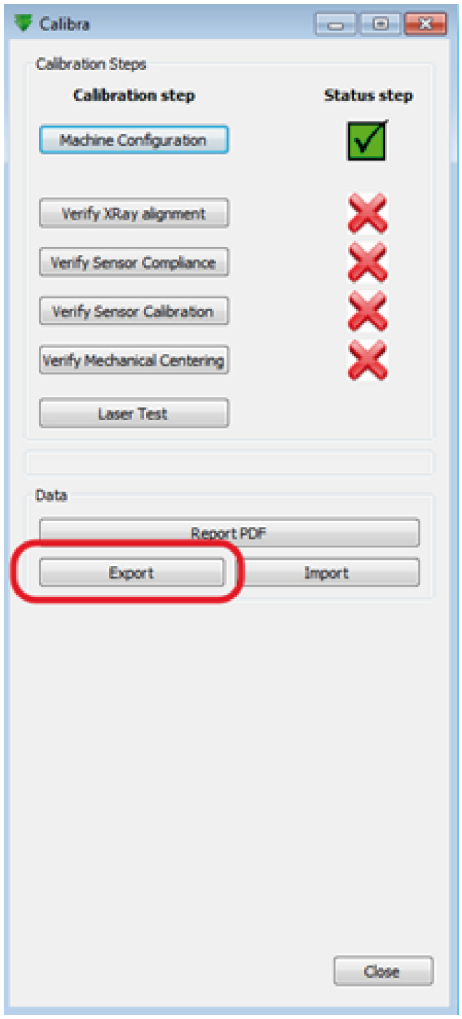
If one or more of the laser beams is not aligned, use pliers to loosen the spring around the projector support and align the beam manually. The frankfurt plane and canine lasers are under the generator cover.



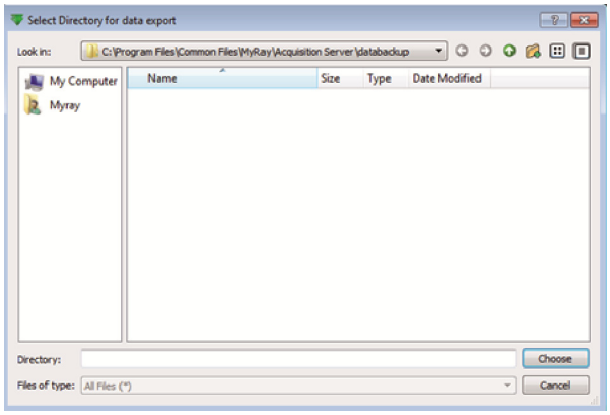
The sagittal laser is below the mirror.

Press “Exit ” at the end of the procedure.

2.7. CALIBRATION DATA BACKUP

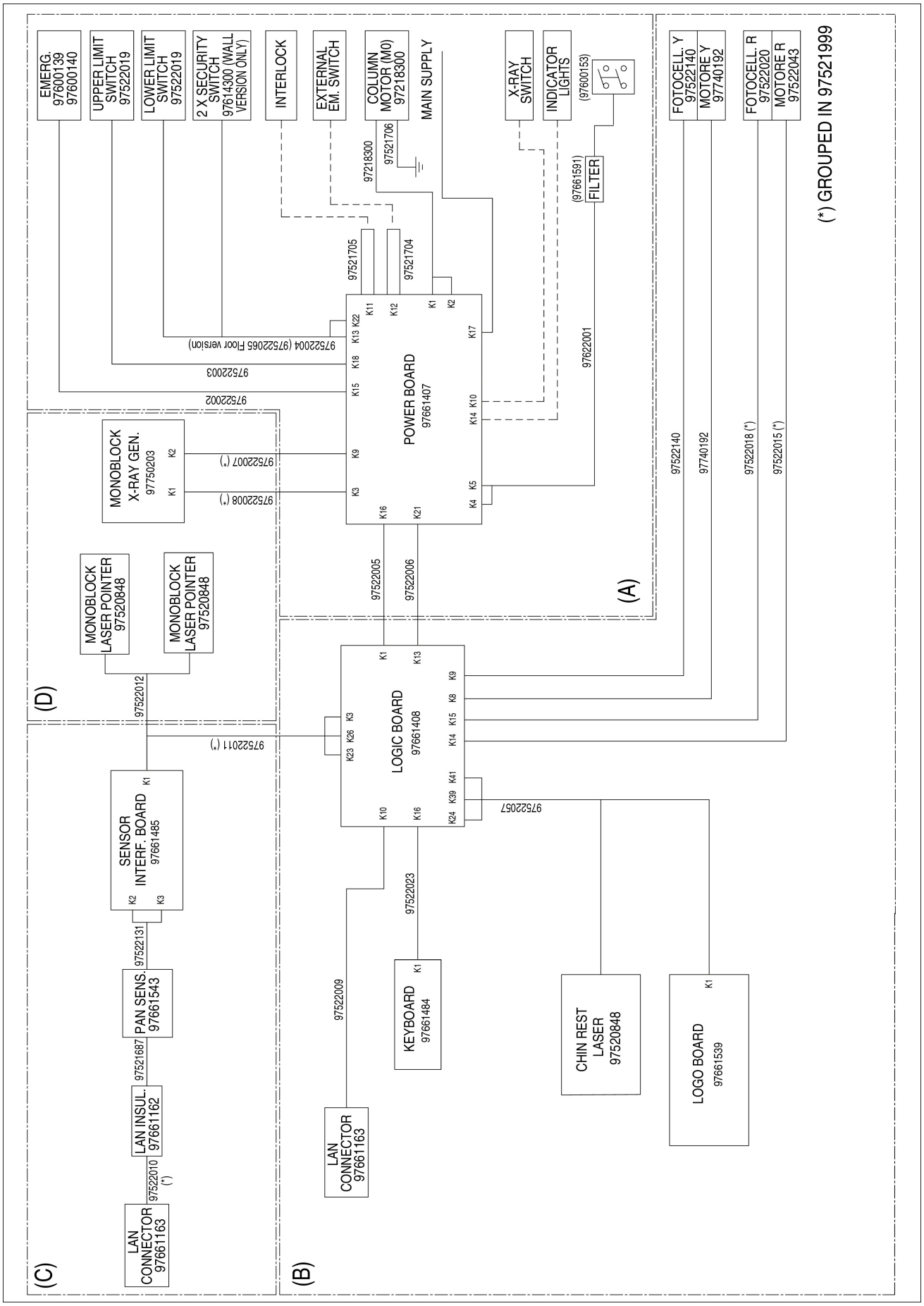


Click on “Export”, select the destination folder and confirm.

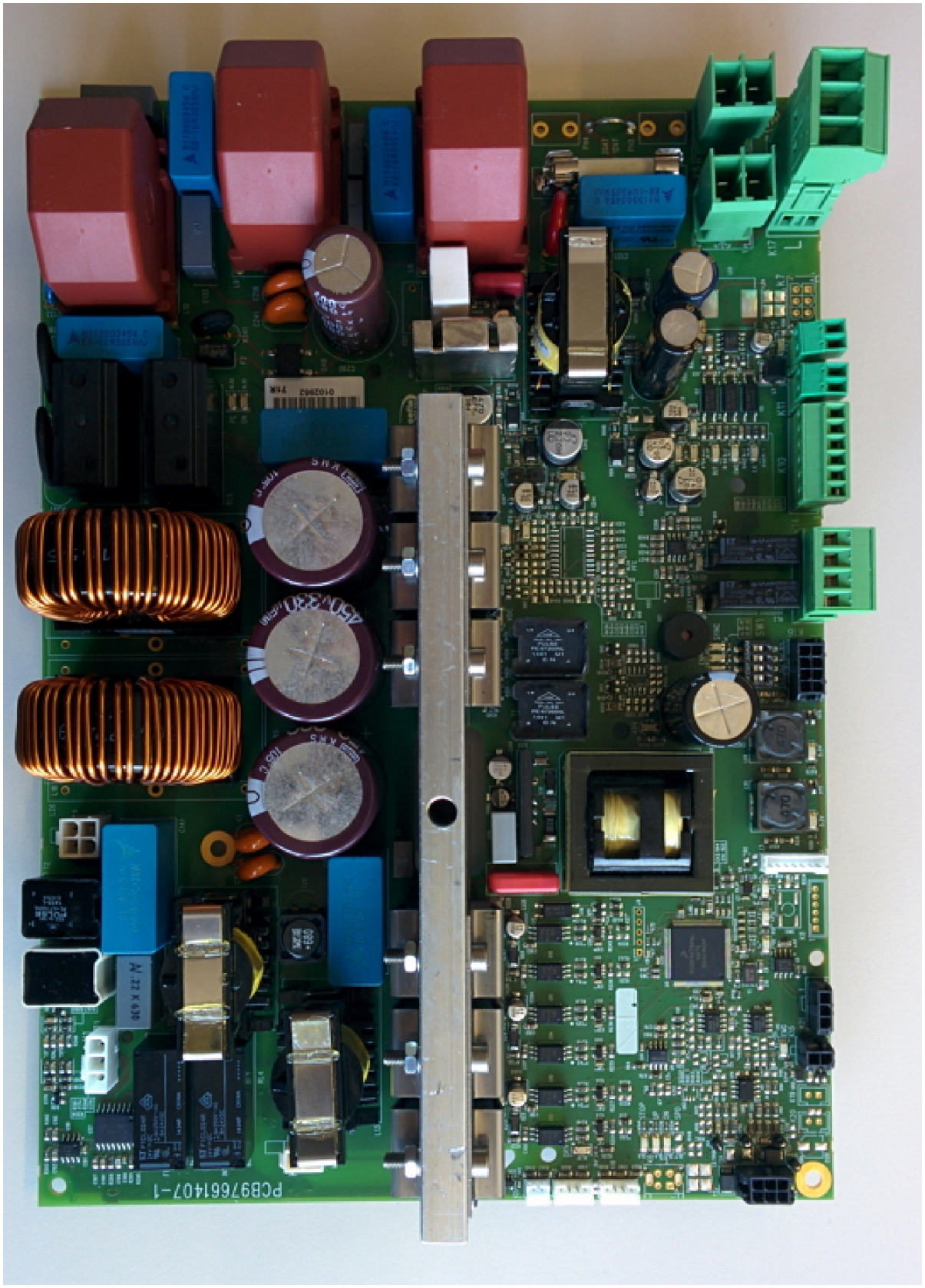


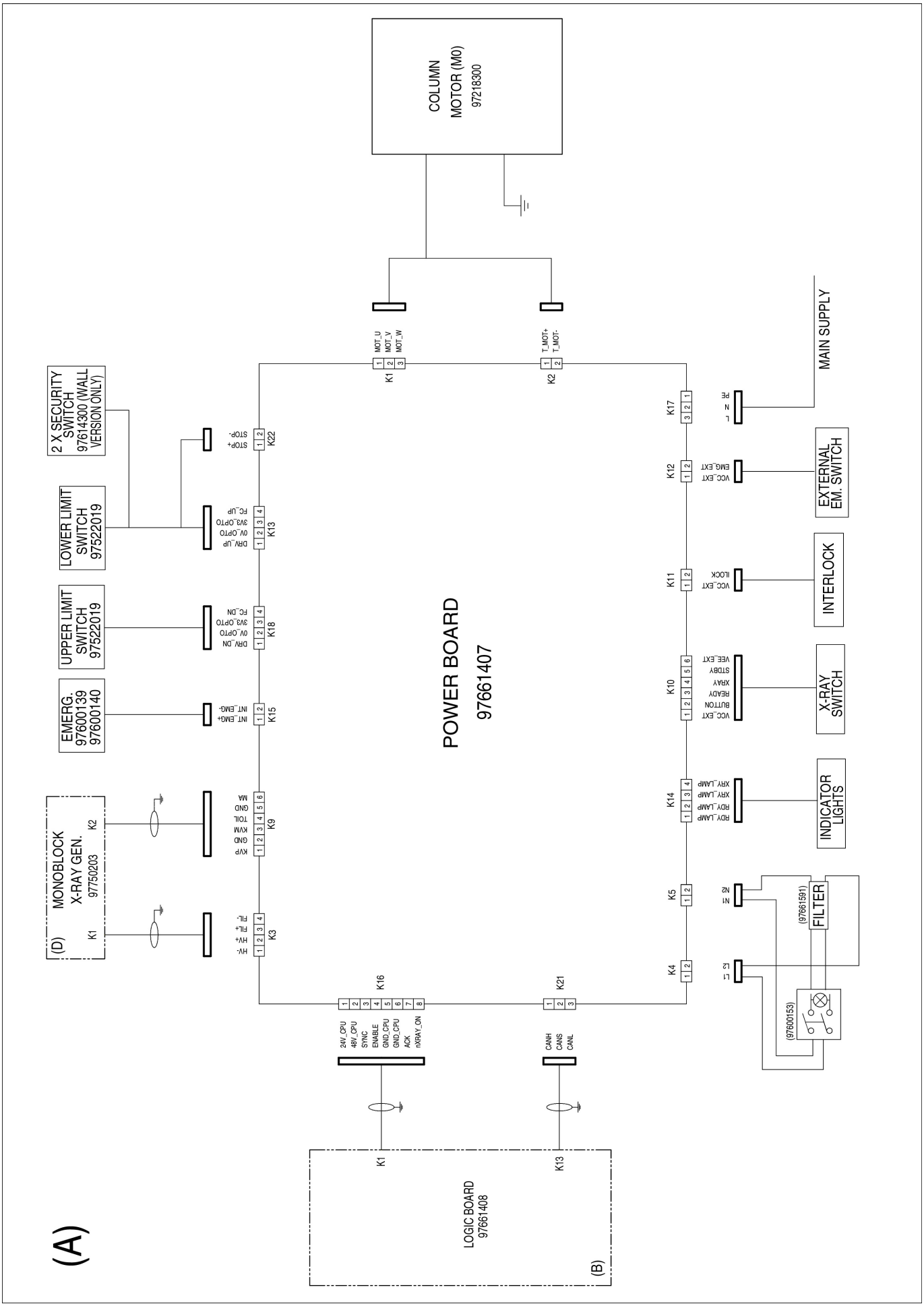
3. CONTROL BOARDS DESCRIPTION

3.1. UNIT BLOCK DIAGRAM



3.2. POWER BOARD 97661407




COLUMN
MOTOR (M0)
97218300
MOT_U
MOT_V
MOT_W
T_MOT+
T_MOT-
K1
K2
POWER BOARD
97661407
MAIN SUPPLY
2 X SECURITY SWITCH 97614300 (WALL VERSION ONLY)
LOWER LIMIT SWITCH 97522019
UPPER LIMIT SWITCH 97522019
EMERG. 97600139 97600140
(D) MONOBLOCK X-RAY GEN. 97750203
K1
K2
K3
K9
K13
K15
K18
K22
K17
K12
K11
K10
K14
K5
K4
K16
K21
STOP+
STOP-
DRV_UP
0V_OPTO
3V3_OPTO
FC_UP
DRV_DN
FC_DN
INT_EMG+
INT_EMG-
HV+
FIL+
FIL-
KVP
KVM
TOIL
MA
GND
PE
N
L
VCC_EXT
EMG_EXT
ILOCK
BUTTON
READY
XRAY
STDBY
VEE_EXT
RDY_LAMP
XRY_LAMP
N2
N1
L2
L1
EXTERNAL EM. SWITCH
INTERLOCK
X-RAY SWITCH
INDICATOR LIGHTS
FILTER
(97661591)
(97600153)
24V_CPU
48V_CPU
SYNC
ENABLE
GND_CPU
GND_CPU
ACK
nXRAY_ON
CANH
CANS
CANL
LOGIC BOARD
97661408
(A)
(B)

3.2.1. CONNECTORS LIST

CONNECTOR	DESCRIPTION
K17	Mains power supply
K4	Power switch live wire
K5	Power switch neutral wire
K12	External emergency button - optional
K11	Door interlock - optional
K10	X-ray button
K14	External signal lamps – Optional- Wires 1,2 ready - Wires 3,4 x-ray emission
K16	Power supply for “logic” board
J3	Not used
K21	Can bus connector
K15	Integrated emergency button (on column)
K9	Monobloc feedback
K18	Column lower endpoint photocell
K13	Column upper endpoint photocell
K22	Column anti-pinch switch
K2	Column motor thermal sensor
K1	Column motor power supply
K3	Monobloc power supply

3.2.2. FUSES AND DIP SWITCHES LIST

FUSE ID	NOTES	DESCRIPTION
FH1/FH2	Mains power supply fuse	FUSE 20AF250v 6.3x32 115V FUSE 12AF 250v 6.3x32 230V
F2	Standby power fuse	FUSE 2AT 230V
F1	48V output fuse	FUSE 2,5AF 450V DC

DIP Switches	
SW1	Always off, reserved use

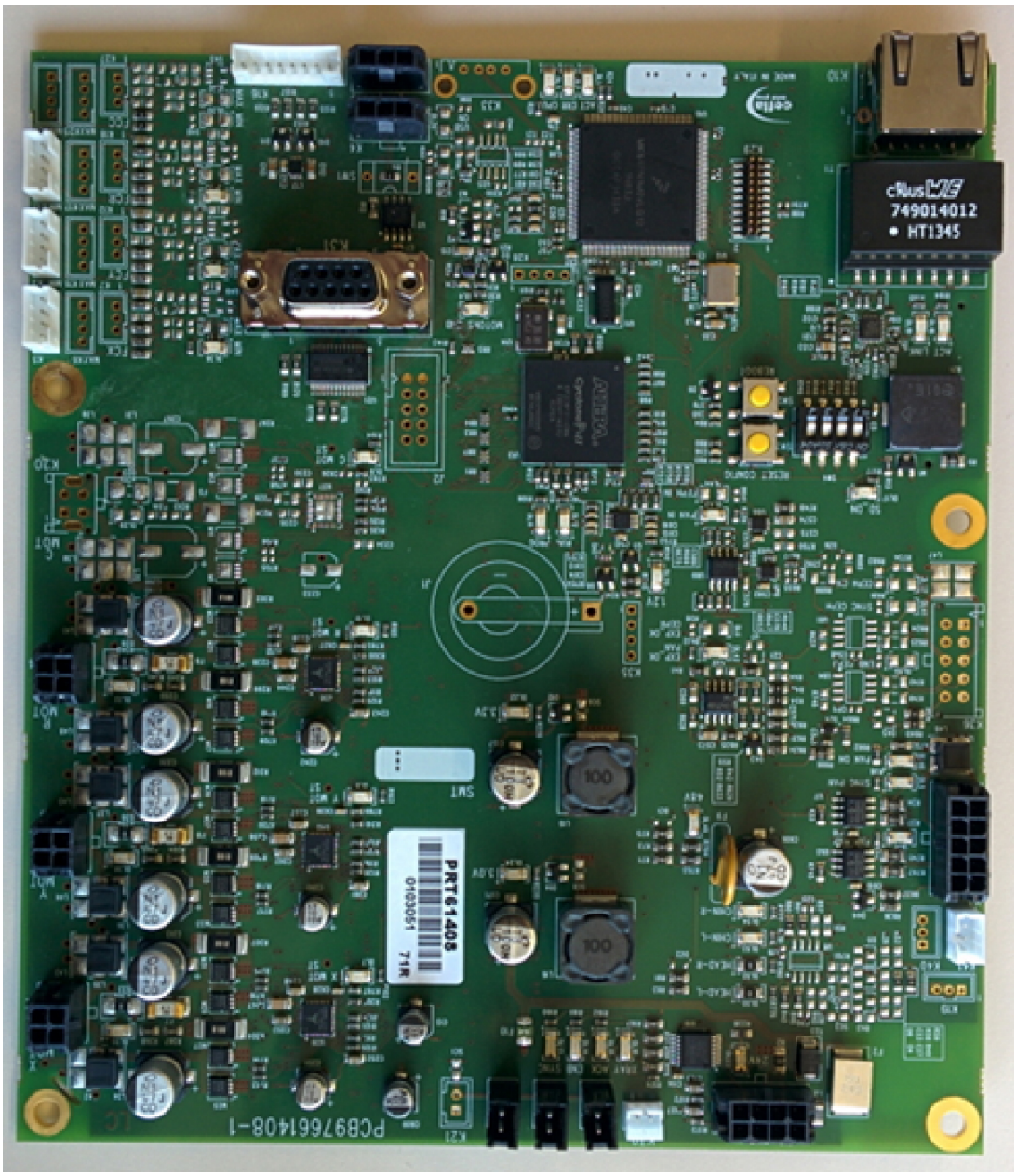
3.2.3. LEDS LIST

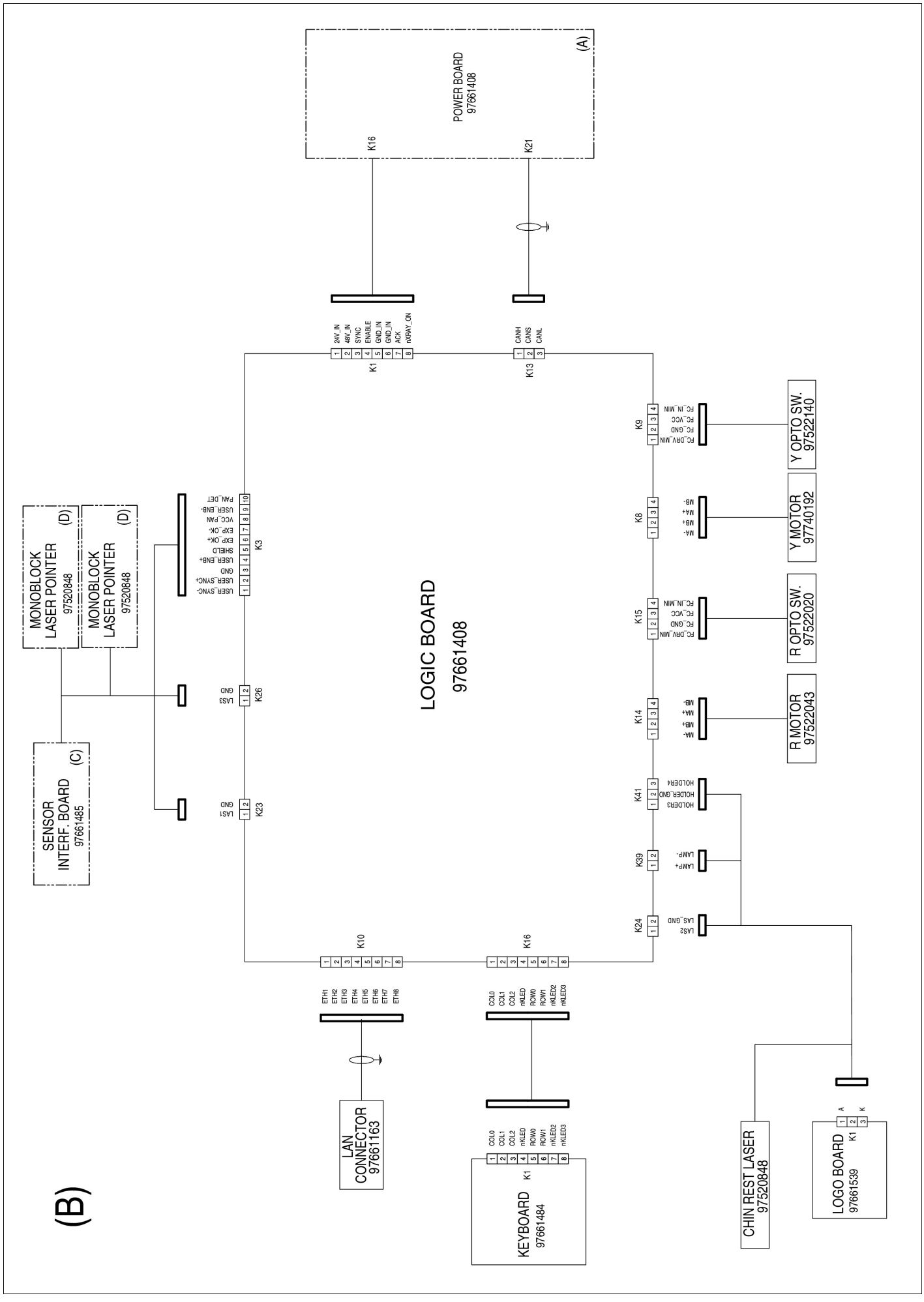
LED ID	COLOR	NAME ON BOARD	DESCRIPTION
DL1	YELLOW	ACT	CAN communication activity: normally flashing. Problems on CAN bus If off or on steady
DL2	RED	ERR	Error status, normally off. Flashing upon startup, the number of flashes represents the FW version. When ERR is on the number of flashes from CPU LED represents the error code.
DL3	GREEN	CPU	Normally flashing at 1Hz 10Hz during column movement or x-ray emission When ERR is on the number of flashes from CPU LED represents the error code.
DL4	YELLOW	UP	Normally off, if on the upper column endpoint has been reached. Always on if photocell damaged or disconnected.
DL5	YELLOW	DN	Normally off, if on the upper column endpoint has been reached. Always on if photocell damaged or disconnected.
DL6	RED	STOP	Normally off, if on the anti-pich microswitch has been pushed. Always on if microswitch damaged or disconnected.
DL8	YELLOW	VAC	On when mains power supply is on. Off during stand by or in case of issues with power amplifier on the board.

LED ID	COLOR	NAME ON BOARD	DESCRIPTION
DL9	YELLOW	VDC	On when 390V are present on power amplifier. Off when in stand-by or in case of issues with the power amplifier.
DL10	GREEN	-5VA	Analog -5.3V present, normally on
DL11	GREEN	+5VA	Analog +5.3V present, normally on
DL13	GREEN	18V	18V driver tension present, normally on
DL14	GREEN	12V	12V driver tension present, normally on
DL15	GREEN	5.0V	5V CPU tension present, normally on
DL16	GREEN	12V_EXT	12V for x-ray button, emergency button and interlock, normally on.
DL17	GREEN	3.3V	3.3V CPU tension present, normally on
DL18	GREEN	24V	24V tension present, normally on
DL19	GREEN	SYNC	Power-LOGIC boards sync signal, normally off
DL20	GREEN	ENB	Inverter enabled signal from LOGIC board, normally on. Off during standby or in error condition.
DL21	GREEN	ACK	Acknowledged signal from LOGIC board, normally off.
DL23	GREEN	RDYL	External “ready” lamp relay status. Normally off, on when unit is “ready”.
DL24	YELLOW	XRYL	External “x-ray on” lamp relay status. Normally off, on during x-ray emission.
DL25	GREEN	BUT	Xray button pressed. On when x-ray button is pressed.
DL26	YELLOW	ILK	Interlock status. Normally off. On if door is open or interlock is not connected.
DL27	RED	EMG	External emergency button status. Normally off. On if External emergency button status is pressed or not connected.
DL28	YELLOW	FIL	X-ray filament on. On during emission.
DL29	YELLOW	INV	Inverter on. On during emission
DL30	YELLOW	DRV	Driver enabled, normally on. Off during standby or in error condition.
DL31	GREEN	48V	48V tension ON. Off during standby or in error condition.
DL32	YELLOW	ON	Mains power supply to power ampifier relay status. Off during standby or in error condition.
DL33	YELLOW	PC	Preload resistance by-pass relay. Off during standby or in error condition.
DL35	RED	EMG	Integrated emergency button status. Normally off. On if integrated emergency button status is pressed or not connected.
DL36	RED	MT	Column engine overload. Normally off. On when thermal sensor is active or not connected.

To connect the X-ray button, use k10 connector as follows:
PIN 1-2: X-ray emission contact
PIN 3: signal "Ready"
PIN 4: signal "X-ray ON"
PIN 5-6: not used

3.3. LOGIC BOARD 97661408




(A)
POWER BOARD
97661408
K16
K21
24V_IN
48V_IN
SYNC
ENABLE
GND_IN
GND_IN
ACK
nXRAY_ON
K1
CANH
CANS
CANL
K13
LOGIC BOARD
97661408
K9
FC_DRV_MIN
FC_GND
FC_VCC
FC_IN_MIN
Y OPTO SW.
97522140
K8
MA-
MA+
MB+
MB-
Y MOTOR
97740192
K15
FC_DRV_MIN
FC_GND
FC_VCC
FC_IN_MIN
R OPTO SW.
97522020
K14
MA-
MA+
MB+
MB-
R MOTOR
97522043
K41
HOLDER3
HOLDER_GND
HOLDER4
K39
LAMP-
LAMP+
K24
LAS_GND
LAS2
K3
USER_SYNC-
USER_SYNC+
GND
USER_ENB+
SHIELD
EXP_OK+
EXP_OK-
VCC_FAN
USER_ENB-
FAN_DET
K26
LAS3
GND
K23
LAS1
GND
K10
ETH1
ETH2
ETH3
ETH4
ETH5
ETH6
ETH7
ETH8
K16
COL0
COL1
COL2
nKLED
ROW0
ROW1
nKLED2
nKLED3
MONOBLOCK
LASER POINTER
97520848
(D)
MONOBLOCK
LASER POINTER
97520848
(D)
SENSOR
INTERF. BOARD
97661485
(C)
LAN
CONNECTOR
97661163
KEYBOARD
97661484
K1
CHIN REST LASER
97520848
LOGO BOARD
97661539
K1
(B)

3.3.1. CONNECTORS LIST

CONNECTOR	DESCRIPTION
K10	Ethernet connection to PC
K3	Powe supply and sync signal for sensor interface card.
K41	Not used
K1	Power supply input from powe board
K39	24V power supply toward engraved logo light
K26 K23	Monobloc lasers
K24	Chin rest lasers
K2	Not used
K8	Y axis motor
K14	R axis motor
K5	Not used
K9	Y axis photocell
K15	R axis photocell
K16	Keyboard signals connector
K13	CAN connector to power board
K4	Not used
K31	Serial port, not used
K29	Not used

3.3.2. DIP SWITCHES LIST

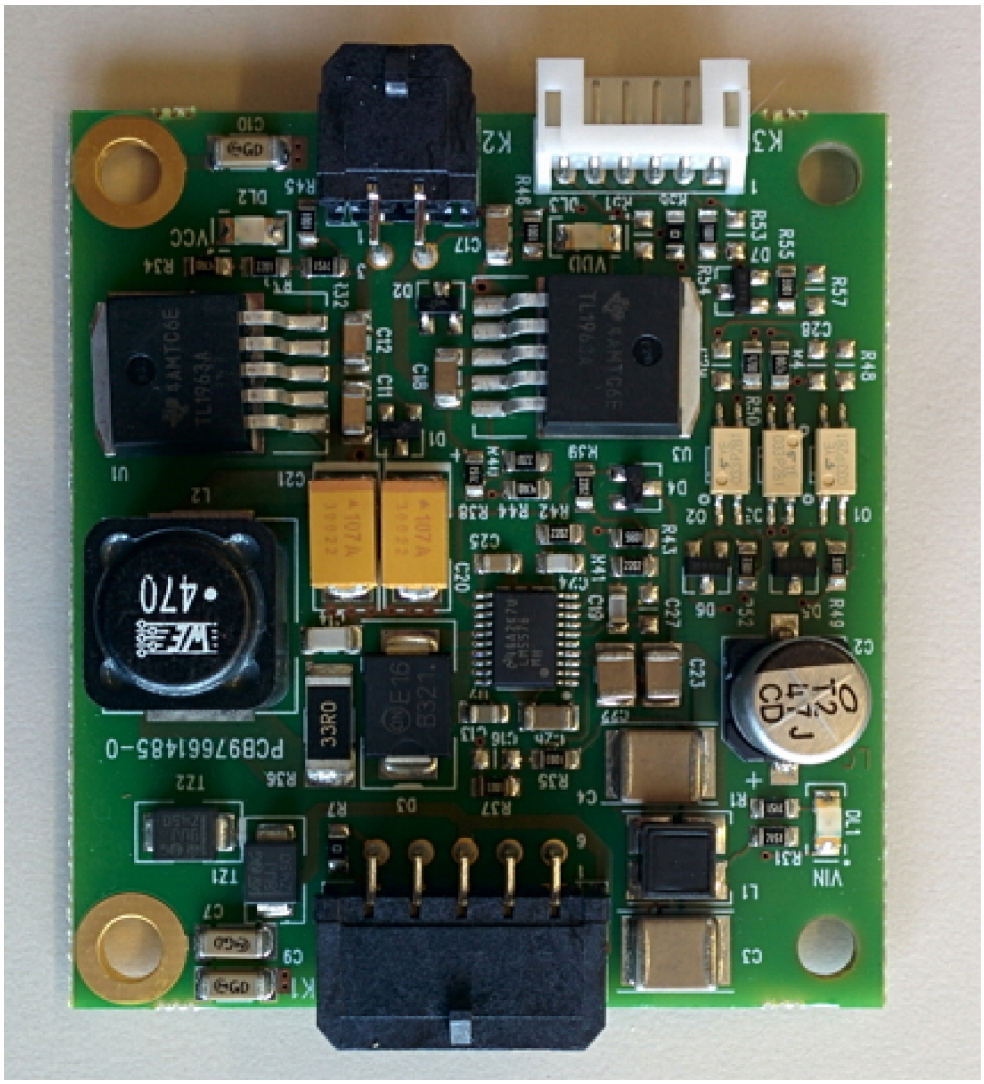
DIP Switches	DESCRIPTION
SW4	Not used, all OFF
SW2	Reboot button
SW3	Factory reset switch

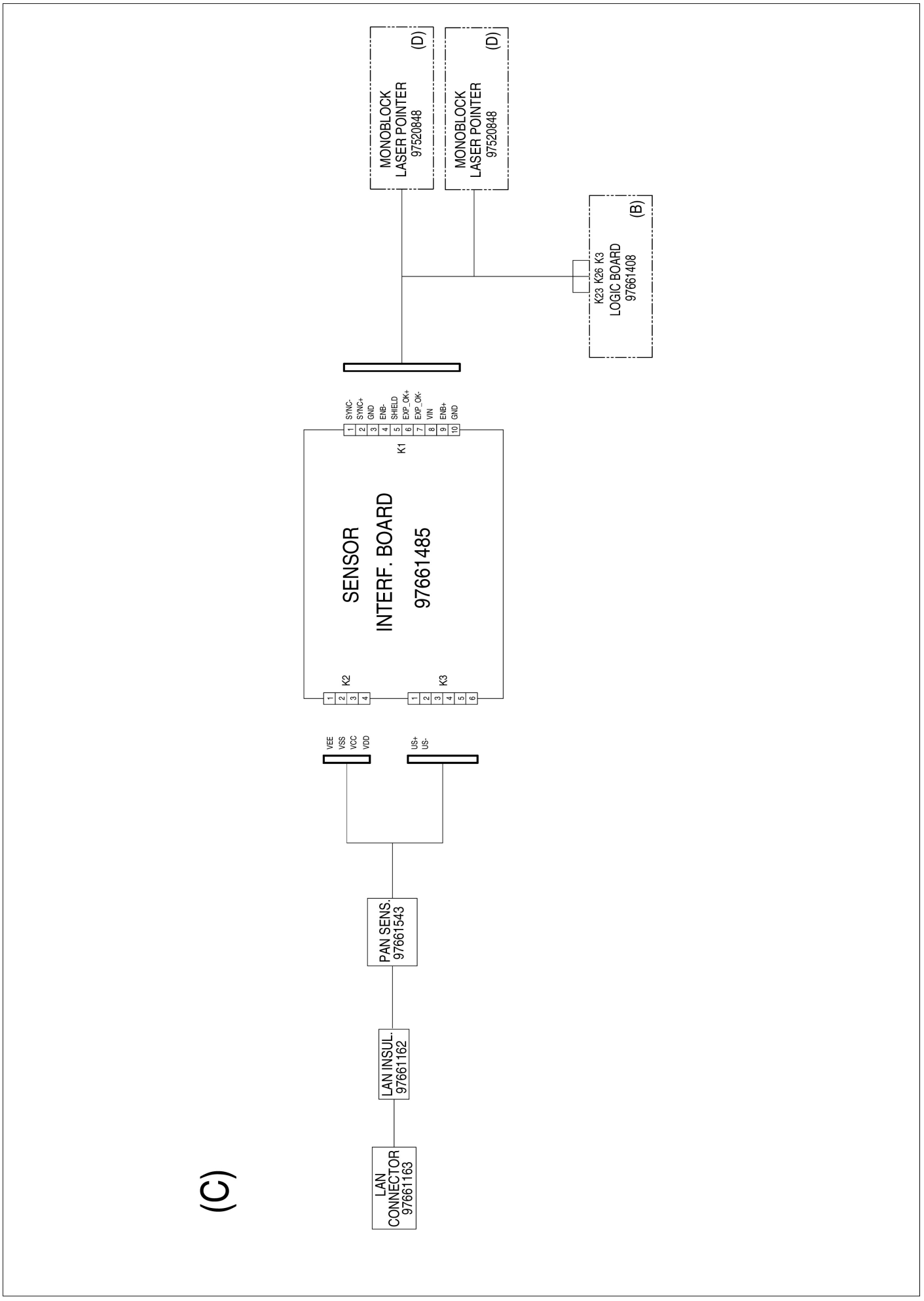
3.3.3. LEDS LIST

LED ID	COLOR	NAME ON BOARD	DESCRIPTION
DL1	YELLOW	CAN ACT	CAN activity. Normally on flashing. On steady or off in case of CAN error condition.
DL2	RED	ERR	Error status, normally off. Flashing upon startup, the number of flashes represents the FW version. When ERR is on the number of flashes from CPU LED represents the error code.
DL3	GREEN	CPU	Normally flashing at 1Hz 10Hz during column movement or x-ray emission When ERR is on the number of flashes from CPU LED represents the error code.
DL4	GREEN	MOTORS	Motors enabled, normally on.
DL5	GREEN	SYNC_PAN	Logic-sensor sync signal, normally off
DL7	GREEN	MOTX	Not Used
DL8	GREEN	MOTY	On if Y motor is active. If flashing the motor is in error (disconnected, short-circuit, overheating, broken driver)
DL9	GREEN	MOTC	Not used
DL10	GREEN	MOTR	On if R motor is active. If flashing the motor is in error (disconnected, short-circuit, overheating, broken driver)
DL11	GREEN	PROG	FPGA programmed, normally on
DL12	GREEN	RUN	FPGA on, normally flashing (3Hz)
DL13	GREEN	SYNC	POWER-LOGIC sync signal, normally off.
DL14	GREEN	ENABLE	Inverter enabled signal from LOGIC board, normally on. Off during standby or in error condition.

LED ID	COLOR	NAME ON BOARD	DESCRIPTION
DL15	GREEN	ACK	Acknowledged signal from LOGIC board, always on.
DL16	GREEN	XRAY	X-ray emission signal from Power board. Normally off, on during emission.
DL17	GREEN	SD_ON	Not used.
DL18	YELLOW	ACT	LAN activity LED. Normally flashing.
DL19	GREEN	LINK	LAN connection estabilished. Normally on.
DL22	GREEN	3.3V	3.3V CPU tension present, normally on
DL23	GREEN	24V	24V tension present, normally on
DL24	GREEN	5.0V	5V CPU tension present, normally on
DL25	GREEN	1.2V	1.2V CPU tension present, normally on
DL32	GREEN		48V R axis Motor tension present, normally on
DL33	GREEN	FCR	R axis photocell. On if photocell is obscured or disconnected/broken.
DL35	GREEN		Not used
DL36	GREEN	FCX	Not used
DL38	GREEN		48V Y axis Motor tension present, normally on
DL39	GREEN	FCY	Y axis photocell. On if photocell is obscured or disconnected/broken.
DL42	GREEN	EXP_OK_PAN	Exposure OK signal from sensor, normally off.
DL43	GREEN	PAN_IN	Sensor present, normally off. On if broken cable or sensor interface board is disconnected.
DL46	GREEN	PAN_ON	48V Sensor power supply ok. Normally on. Off during standby or in error condition on sensor or interface board.
DL49	GREEN	48V	48V from power board on. Off during standby or in error condition.
DL51	GREEN	ENB_PAN	48V enabled on sensor. Normally on. Off during standby or in error condition on sensor or interface board.
DL53	GREEN	CHIN_L	Not used
DL54	GREEN	CHIN_R	Not used

3.4. SENSOR INTERFACE BOARD 97661485




MONOBLOCK
LASER POINTER
97520848
(D)
MONOBLOCK
LASER POINTER
97520848
(D)
K23 K26 K3
LOGIC BOARD
97661408
(B)
SYNC-
SYNC+
GND
ENB-
SHIELD
EXP_OK+
EXP_OK-
VIN
ENB+
GND
K1
SENSOR
INTERF. BOARD
97661485
K2
K3
VEE
VSS
VCC
VDD
US+
US-
PAN SENS.
97661543
LAN INSUL.
97661162
LAN
CONNECTOR
97661163
(C)

3.4.1. CONNECTORS LIST

CONNECTOR	DESCRIPTION
K1	Sync signal and power supply for sensor, from LOGIC board.
K2	Sensor power supply, 2x 5V DC
K3	Sensor synchronization

3.4.2. LEDS LIST

LED ID	DESCRIPTION
DL1 (VIN)	48V from LOGIC board
DL2 (VCC)	Analog 5V towards sensor
DL3 (VDD)	Digital 5V towards sensor

3.5. KEYBOARD BOARD 97661484

3.5.1. CONNECTORS LIST

CONNECTOR	DESCRIPTION
K1	Keyboard signals from LOGIC

3.6. LOGO BOARD 97661539

3.6.1. CONNECTORS LIST

CONNECTOR	DESCRIPTION
K1	24V power supply fron Logic board