FireCR dental

Service Manual

Hardware revisions **AH** and later.



FireCR dental

FireCR Dental Computed Radiography Reader

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This manual covers replacement of hardware for revision **AH** and later.

The hardware revision of the unit can be identified using the serial number on the back of the unit. The centre part of the serial number contains two decimals, and 4 alphanumerical characters, the last two identifies the hardware revision.

Please ensure these are AH or later e. g. FR-11-00DHAH-XXXXXX, on some units the serial has been changed to a UDI, the hardware revision for these can be verified like shown in the following example: (1)08809466040214(11)160502(10)FR1100AH(21)XXXXXX.

Parts removal/replacement

Disassembly

1. Set the reader into "sleep mode" by pressing on the half-moon symbol on the display.



2. Switch off the reader on the back and disconnect all cables.





3. Remove the 4 screws using a Philips #2 screwdriver and remove the rear cover.

Push the door inwards and upwards to gain a decent handhold on the inside of the front cover (1), then pull outwards and upwards to remove the front cover from the rest of the unit (2).



5. Turn the front cover over to gain access to the cables.

6. Tip the lock of the ribbon cable and disconnect the ribbon cable (1) and motor power cable (2) from the TFT LCD display driver board.



7. Put the reader on the side being careful not to damage it, and remove the 6 screws using a Philips #2 screwdriver.





8. Set the reader back upright and carefully lift the top cover off.



9. Remove the 4 screws fastening the inner chassis using a 2.5 mm hex key and lift it off.

Replacing the door assembly

- 1. Follow step 1, 2, 4, 5 and 6 of **Disassembly**.
- 2. Replace the door assembly and install in reverse order.
- 3. Calibrate the LCD as described in the LCD calibration section.

Replacing the covers assembly

- 1. Follow step 1 through 9 of **Disassembly**.
- 2. Replace the covers and install in reverse order.

Replacing the top cover

- 1. Follow step 1 through 8 of **Disassembly**.
- 2. Turn the cover over and release the locks fastening the top cover onto the side cover.



3. Replace the top cover and install in reverse order.

Replacing the side cover

- 1. Follow step 1 through 8 of **Disassembly**.
- 2. Turn the cover over and release the locks fastening the top cover onto the side cover.



- 3. Replace the side cover and install in reverse order.
- 4. Fasten the serial number sticker on the back of the cover.

Replacing the inner cover

- 1. Follow step 1 through 9 of **Disassembly**.
- 2. Replace the inner cover and install in reverse order.

Replacing the bottom cover

- 1. Follow step 1 through 8 of **Disassembly**.
- 2. Put the scanner onto its side and remove the 6 screws using a 2.5mm hex key and remove the bottom cover.



3. Replace the bottom cover and install in reverse order.

Replacing the rear cover

- 1. Follow step 1 through 3 of **Disassembly**.
- 2. Replace the rear cover and install in reverse order.

Replacing the front board

- 1. Follow step 1 through 9 of **Disassembly**.
- 2. Unlock (1) and disconnect (2) the ribbon cables from the front board.



3. Unplug the connectors from the front board.



4. Remove the 3 screws using a 2.5 mm hex key.



5. Replace the front board and install in reverse order.

Replacing the left PSD sensor

- 1. Follow step 1 through 9 of **Disassembly**.
- 2. Remove the 2 screws using a 2.5 mm hex key.



3. Cut the cable tie and disconnect the PSD sensor from the front board PCB.



4. Replace the left PSD and install in reverse order.

Replacing the laser module

- 1. Follow step 1 through 9 of **Disassembly**.
- 2. Disconnect the BLDC motor (1) and laser (2) from the front board.



3. Remove the 3 screws using a 2.5 mm hex key letting the front board hang loose.



4. Remove the 4 screws using a 2.5 mm hex key.



5. Replace the laser module and install in reverse order.

Replacing the optics bracket

- 1. Follow step 1 through 9 of **Disassembly**.
- 2. Disconnect **J1** and **J4** from the bottom board.



3. Unlock (1) and disconnect (2) the ribbon cable from the front board.



4. Put the scanner onto its side and remove the 6 screws using a 2.5mm hex key and remove the bottom cover.





5. Remove the 2 screws fastening the left PSD using a 2.5 mm hex key.

6. Rotate the unit to the other side and remove the 2 screws fastening the right PSD using a 2.5 mm hex key.



7. Cut the cable tie and disconnect the eraser from the front board.





8. Remove the 4 screws fastening the bracket using 3 mm hex key.

- 9. Carefully lift the optics assembly out of the unit.
- 10. Remove the 4 screws from the bracket using a 2.5 mm hex key.



11. Remove the 2 screws fastening the eraser using a Philips #1 screwdriver.



12. Remove the eraser (1) while guiding the wires through the eraser cover (2).



13. Replace the optics bracket and install in reverse order.

Replacing the eraser

- 1. Follow step 1 through 9 of **Disassembly**.
- 2. Cut the cable tie and disconnect the eraser from the front board.



14. Remove the 2 screws fastening the eraser using a Philips #1 screwdriver.



15. Remove the eraser (1) while guiding the wires through the eraser cover (2).



3. Replace the eraser and install in reverse order.

Replacing the right PSD sensor

- 1. Follow step 1 through 9 of **Disassembly**.
- 2. Disconnect the PSD sensor from the front board.



3. Remove the 2 screws fastening the right PSD using a 2.5 mm hex key.



4. Replace the PSD sensor and install in reverse order.

Replacing the PMT assembly

- 1. Follow step 1 through 9 of **Disassembly**.
- 2. Put the scanner onto its side and remove the 6 screws using a 2.5mm hex key and remove the bottom cover.



3. Disconnect the BNC (1) and HV (2) connectors from the back of the main board.



4. Rotate the unit to access the opposite side and remove the 2 screws fastening the bracket using a Philips #1 screwdriver. Reuse the bracket during installation.





5. Remove the 4 screws on the bottom of the unit using a 3 mm hex key.

- 6. Replace the PMT assembly and install in reverse order reusing the metal bracket.
- 7. Continue onto **PMT gain and ADC offset verification/adjustment**.

Replacing the power board

- 1. Follow step 1 through 9 of **Disassembly**.
- 2. Disconnect the step motor (1) and mains power switch (2) from the power board.



3. Remove the tape from the power board.



4. Remove the 4 screws fastening the power board using 2.5 mm hex key.



- 5. Remove the power board by pulling it out of the connector on the main board.
- 6. Replace the power board and install in reverse order.

Replacing the main board

- 1. Follow step 1 through 9 of **Disassembly**.
- 2. Disconnect the step motor (1) and mains power switch (2) from the power board.



3. Remove the tape from the power board.



4. Remove the 4 screws fastening the power board using 2.5 mm hex key.



- 5. Remove the power board by pulling it out of the connector on the main board.
- 6. Rotate the unit to gain access to the other side and disconnect the BNC (1) and HV (2) connectors from the back of the main board.



7. Disconnect **J5** and **J7** from the back of the main board.



8. Unlock (1) and disconnect (2) the ribbon cable from the front board.





9. Remove the 4 stanchions fastening the main board using a 5 mm nut driver.

- 10. Remove the main board from the electronics bracket.
- 11. Release the SD card by pressing on it (1) until you hear a soft click, then pulling it out of the card holder (2).



- 12. Replace the main board and install in reverse order.
- 13. Update the firmware in the unit as described in the <u>Updating the firmware after parts</u> <u>replacement</u> section.

Replacing the BLDC driver board

- 1. Follow step 1 through 9 of **Disassembly**.
- 2. Disconnect J2 and J3 from the BLDC driver board.



3. Remove the 4 screws using a 2.5 mm hex key.



4. Replace the BLDC driver board and ensure the DIP switches are set to 0011 (off-off-on-on) and install in reverse order.

Replacing the mains power switch

- 1. Follow step 1 through 9 of **Disassembly**.
- 2. Remove the wires from the mains power switch by pulling the connectors off.



3. Press the 2 locks inwards and remove the mains power switch out of the rear of the electronics bracket.





4. Replace the mains power switch and install in reverse order ensuring the orientation of the mains power switch is as shown.

Replacing the SD memory card

- 1. Follow step 1 through 3 of **Disassembly**.
- 2. Release the SD card by pressing it until you hear a soft click.



3. Replace the SD card and install in reverse order ensuring the orientation of the SD is as shown.



- 4. Update the firmware in the unit as described in **the <u>Updating the firmware after parts</u>** <u>replacement</u> section.
- 5. Continue onto **PMT gain and ADC offset adjustment**.
- 6. Continue onto **<u>Scanner calibration</u>**.

Replacing the RFID board

Illustrations are shown for the torsion spring tray assembly; however, the procedure is the same for a piano wire tray assembly.

- 1. Follow step 1 through 9 of **Disassembly**.
- 2. Move the tray assembly to the front of the unit by bushing on the back of the tray assembly until the IP tray is released.



3. Remove the screws fastening the spring brackets to the tray using a 2.5 mm hex key. There is one located on either side of the tray assembly.



4. Remove the 2 screws fastening the tray using a 2.5 mm hex key and carefully lift the tray out. Note that the flexible FFC cable is fastened with an adhesive and may be disconnected if the tray is on pulled too hard



5. Remove the screw fastening the micro switch using a PH0 screwdriver.



6. Remove the screw fastening the tray onto the mounting bracket using a 2.5 mm hex key.



7. Remove the 2 screws on either side of the tray using a PH1 screwdriver.



8. Unlock (1) and disconnect (2) the flexible FFC cable.



9. Replace the RFID board and install in reverse order taking care that the 2 screws fastening the tray are not tightened too much as this would restrict the movement of the tray assembly.



Replacing the tray assembly

Illustrations are shown for the torsion spring tray assembly; however, the procedure is the same for a piano wire tray assembly.

- 1. Follow step 1 through 9 of **Disassembly**.
- 2. Unlock (1) and disconnect (2) the flexible FFC cable from the bottom board using a pair of tweezers as the connector is positioned behind the bracket.



3. Rotate the unit to gain access to the other side and move the tray assembly to the shown position and remove the 2 screws fastening the clamp using a 1.5 mm hex key. Then remove the clamp.





4. Remove the screw fastening the ejector guide using a 2.5 mm hex key, then remove the guide.

5. Remove the 4 screws on the bearing for the drive belt using a 2.5 mm hex key and remove the bearing.



6. Remove the screw for the bottom board PCB frame using a 2.5 mm hex key as the frame acts as an end stop for the tray assembly.



- 7. Lift the frame out of the way and slide the tray assembly off the rail, bear in mind the ribbon cable is fastened with an adhesive.
- 8. Replace the tray assembly and install in reverse order noting the orientation of the flexible FFC cable.

Replacing the bottom board

- 1. Follow step 1 through 9 of **Disassembly**.
- 2. Unlock (1) and disconnect (2) the flexible FFC cable from the bottom board using a pair of tweezers as the connector is positioned behind the bracket.



8. Disconnect **J1** and **J4** from the bottom board.



3. Remove the 2 screws from the bottom board using a 2.5 mm hex key.



4. Remove the screw fastening the bottom board frame using a 2.5 mm hex key.



5. Lift the frame up and to the side to allow the bottom board to come out.



6. Slide the bottom board out.



7. Replace the bottom board and install in reverse order.

Replacing the stage base assembly

- 1. Follow step 1 through 9 of **Disassembly**.
- 2. Disconnect the stepper motor from the power board.



9. Disconnect **J1** and **J4** from the bottom board.



4. Remove the 6 screws using a 2.5mm hex key and remove the bottom cover.





3. Remove the 12 screws on the bottom using a 3 mm hex key.

- 4. Carefully remove the stage base assembly from the remaining assemblies.
- 5. Remove the 4 screws from the stepper motor mounting bracket using a 2.5 mm hex key.



6. Loosen the pivot screws from the stepper motor shaft using a 1.5 mm hex key. You may have to rotate the step motor to gain access to the screws.



- 7. Lift the stepper motor up and out of the socket.
- 8. Remove the 2 screws fastening the clamp using a 1.5 mm hex key and remove the clamp.





9. Remove the 3 screws using a 2.5 mm hex key and remove the motor base.

- 10. Remove the drive belt.
- 11. Rotate the unit to gain access to the opposite side and unlock (1) and disconnect (2) the ribbon cable from the bottom board.



12. Remove the screws from the bottom board using a 2.5 mm hex key and remove the bottom board.





13. Remove the screw fastening the bottom board frame using a 2.5 mm hex key.

14. Remove the screw from the ejector guide using a 2.5 mm hex key, then remove the ejector guide.



15. Remove the 4 screws from the drive belt bearing using a 2.5 mm hex key and remove the drive belt bearing.







17. Replace the stage base assembly and install in reverse order.

Replacing the drive belt

- 1. Follow step 1 through 9 of **Disassembly**.
- 2. Remove the 4 screws from the stepper motor mount using a 2.5 mm hex key.



3. Loosen the 2 socket screws from the step motor drive shaft using a 1.5 mm hex key, you may have to rotate the step motor to gain access to the screws.



4. Lift the step motor out of the way.



5. Remove the 2 screws fastening the clamp using a 1.5 mm hex key. Then remove the clamp.

6. Remove the 3 screws from the motor base using a 2.5 mm hex key.



7. Remove and replace the drive belt, install the new drive belt in reverse order.

Replacing the stepper motor

This guide shows the replacement of the SAEHAN stepper motor, if the unit has a ws10 mm stepper motor, please follow the steps in the upgrade manual for stepper motor and power board.

- 1. Follow step 1 through 9 of **Disassembly**.
- 2. Disconnect the stepper motor power cable from the motor



3. Remove the 4 screws from the stepper motor mount using a 2.5 mm hex key.



4. Loosen the 2 socket screws from the step motor drive shaft using a 1.5 mm hex key, you may have to rotate the step motor to gain access to the screws.



- 5. Lift the stepper motor up.
- 6. Remove the 4 screws fastening the motor mount to the stepper motor and reuse the motor mount during installation.



7. Install in reverse order.

Updating the firmware after parts replacement

After parts have been replaced the firmware should be updated to match the version of parts in the unit.

Only one application may communicate with the unit at a time, so in order for the updater to find the unit, please close all other related applications and ensure the ACQ manager is not running in the background by opening the task manager.

If the ACQ manager is running, end the process before running the firmware updater.

To do this you need to set the firmware updater into factory mode. This is done by creating an empty text (.txt) named **factory_mode.txt**. This file should be located in the same folder as the firmware updater for it to activate the extended functionality.

Name	Date modified	Туре	Size
CRSwing.dll	22-10-2015 12:13	Application extens	4.788 KB
dbghelp.dll	17-08-2015 05:17	Application extens	1.056 KB
🚜 DBManager.exe	17-08-2015 05:17	Application	172 KB
DentalCR_SystemUpdater.exe	22-10-2015 12:13	Application	14.786 KB
dtkr2.dll	17-08-2015 05:17	Application extens	295 KB
DtxLinkQuantor.dll	17-08-2015 05:17	Application extens	14 KB
DtxLinkReg.bat	17-08-2015 05:17	Windows Batch File	1 KB
BtxLinkRegQuantor.exe	17-08-2015 05:17	Application	23 KB
DtxLinkUnreg.bat	17-08-2015 05:17	Windows Batch File	1 KB
🛃 DXViewer.exe	17-08-2015 05:18	Application	333 KB
factory_mode.txt	14-09-2015 07:51	Text Document	0 KB
🔄 FireCr.ini	12-11-2015 11:42	Configuration sett	1 KB
G FireCRDriver.exe	26-11-2013 03:40	Application	168 KB
FireCRDriver_overwrite.exe	22-10-2015 12:13	Application	162 KB

Double click the **DentalCR_SystemUpdater.exe** file to start the firmware update application. The version of the updater can be seen in the second line in the log window on the right hand side. Ensure to always use the latest version available.

Denial type	^		Parts Information		
updater version: 1.0.0.211		Connect	O AA v1 O AA v2 O AB	AD AE AF	ha () Caj
		update	U AC	() AG	
		apres et	step motor	0	0
			Oscrew	O sst 10mm	Ows 10mm(AH)
			O wm 20mm	• ws 10mm(~A0) O SAEHAN
			main board		
			🔿 coreboard 2.	0 O mainboard 1.	01 (i) mainboard 2.0 o
			ROHS LCD	door type	f-0
			⊙ no ⊚ yes	O old ● AG	⊙ no ● yes

Press the connect button to read the current data from the unit.

Once data are read and shown, ensure that the correct parts are marked for selection as the unit will not operate correctly if these are wrong.

Once the parts used in the unit has been selected, press the update button to load the information into the unit. The updater requires 5 passes to complete the upload and will then prompt you to switch the unit off and on again to allow the unit to boot with the new firmware and parts information.

Description of parts information

The settings on the right hand side of the firmware updater are present to allow the use of older and newer parts cancelling the need to have multiple stocks of each.

<u>Parts information</u> – Select the base version of the unit being updated depending on the serial number. e.g. an FR11-00EA**AG**-XXXXXX would be an **AG** as a base model.

<u>Step motor</u> – Select the model of step motor currently used in the unit. The standard layout is a follows;

- **AA** Screw type stepper motor.
- **AB** wm 20mm stepper motor with a drive belt.
- **AC** ws 10mm stepper motor with drive belt.
- AD sst 10mm stepper motor with drive belt.
- **AE** ws 10mm (~AG) stepper motor with drive belt.
- **AF** ws 10mm (~AG) stepper motor with drive belt.
- AG ws 10mm (~AG) stepper motor with drive belt.
- **AH** ws 10mm (AH) stepper motor with drive belt.
- AJ SAEHAN stepper motor with drive belt.

<u>Main board</u> – Select the version of main board that is currently installed in the unit. The version number is printed onto the PCB.

<u>ROHS LCD</u> – Starting from the **AE** model, the LCD was produced in an ROHS approved version, this is identified by the (Pb) marking on the PCB itself.

<u>Door type</u> – Select the door assembly type that is currently being used in the unit. The available door assembly types are;

Old – This door type is used on models ranging from AA to AF.

AG – The standard door assembly type for the **AG** model.

AH – The standard door assembly type for the **AH** and later models.

 $\underline{f-\theta}$ – This is the standard laser lens for the **AG** and later models, you can find a small marking on the top of the lens depicting **f-θ** on these.

PMT gain and ADC offset verification/adjustment

Whenever parts that have influence on the gain and offset are replaced it is important to verify, and if necessary adjust the PMT gain and ADC offset to ensure that the image quality is not lowered.

To properly verify the PMT gain and ADC offset you will need the following items;

- QuantorDent(Vet) or similar acquisition software installed on a PC.
- Size 4C dental IP.
- Dosimeter to measure absolute dose.
- X-ray generator.

ADC offset verification and adjustment

- 1. Connect the unit to both a PC and power outlet.
- 2. Switch the unit on.
- 3. Enter the **calibration menu** as described in the user manual for your software.
- 4. For Quantor users use the options icon (1) in the top right hand corner and select "**Device** calibration" (2).



- 5. Position the size 4C IP on the tray and close it to erase the IP.
- 6. Remove the IP from the tray and reposition it on the tray.
- 7. Scan the IP using the blank calibration position.
- 8. Compare the readout value to the tolerance for the blank calibration.

	Device Calibration	Port of the second			
	needs size/c P & H	D Resolution	uption the antire p	DoorNad	
	t			California	
		Katadow	Santabase	Jumphu.	
Blank scan	224	2683	13723	42340	
Teauout value.	0-30m/s 810 280 mm	70.00x/p 8.40x4s 540.280.mm	70.00k/up 1.40m/ls 510.290 mm	70.00Vg 3.50v/s 5.0.45290 nm	— Blank scan tolerance.
				Cancel	

- If the readout value is within the tolerance for the blank scan calibration, continue to **PMT gain verification and adjustment**.
- If the readout value is outside the tolerance for the blank calibration scan, open the scanner control panel and check the box next to the "Edit Params" label.

Model	Francis Dental	ANY	normal unit	
HOM .	1001	INC.	64	
	100151	Prei can		
410	100153	ACC OFFICE	14	
NY	100.151	DHOP	10	
PN	FR11-000046-102211	3P address	192.168.1.171	
MAC	8C48.59:11:03:A8	Subnet Ma	255.255.255.0	
Mode	US8 Mode	Gate Way	192.168.1.1	
Res	HD			
P	None			
RPM	2400			
L/Peak	3710			
R/reak	3807			
RFID	0			
				Edit narameters
		F1 pdt ovc	meters	
		Int cost per a	and and a second se	

• Adjust the value next to the label "ADC offset". Increasing the value will increase the ADC offset level resulting in a lower readout value on the next scan. Decreasing the value will decrease the ADC offset level resulting in a higher readout value on the next scan.

Readonly	parameters	Editable s	araneters		
Model	FeeOR Dental	NKK.	normal unit		
H/W	1.0.0.1	PMT Gan	94		
63.	1.0.0.151	ADC Offset	-7		ADC offset
APP .	1.0.0.151	OHOP	Yes		10001000
PN	FR11-000UAG-102211	3 ^p address	192.168.1.171		
MAC	8C-48:59:11:03:A8	Subnet Ma	255,255,255,0		
Mode	US8 Mode	Gate Way	192.168.1.1		
Res	HD				
P	None				
RPM	2400				
LPeak.	3710				
RPeak.	3807				
RFID	0				
		🗌 tidt para	meters		
		Reset Scare	Save Pacama	Cose	

• Once the value has been altered, click on the button labelled "Save Params". A dialogue will appear asking that you switch the unit off, close the software, switch the unit on and reopen the software.

Mode Vacuation Nax. Norma (ord) NWW 3.0.0.3 PMT Gan 94 NWW 3.0.0.153 ACC offset -7 APP 3.0.0.153 DNCP Yes FN FR31+00C0AG-102211 IP address 2235/61.8172 MAC 0C-48.59:13:03:A8 Subret Me 203205/33.0 Mode US8 Mode Gate Way 235/63.8.1 IPM None - - Res HD - - IPM X000 - - UPesk 3007 - - RPD 0 - -		Par and construct a	Concepte a	ar and cer a	
HWW 1.0.0.13 PMT Gan 94 BL 1.0.0.151 ADC Offic -7 APP 1.0.0.155 DHCP Yes FN FR11-000LAC-102211 JP address 502556500 MACe 66C-48/5/11:03:A8 Subert May 502556500 MACe V68 Mode Gabr Way 502556500 PP None Salam 502556500 JPenk 2400 Lander 502556500 Refeak 2007 A 502556500 RP 0 0 502556500	Model	FRECK Dental	NKK	normal unit	
BL 1.0.0.153 AOC offset ? APP 1.0.0.153 DHCP Yes FN FR13-000LAF-102211 JP address 202.054.8.8.72 MAC 66.4615/s11.00.248 Sabert Ma 202.054.8.8.72 Mode USB Mode Gabr Way 202.068.8.3 Mode USB Mode Gabr Way 202.168.8.3 P None Sabert Ma 202.168.8.3 RMC USB Mode Gabr Way 202.168.8.3 P None Sabert Ma 202.168.8.3 RMT 2400 UDesk 3710 RMBA 3807 A E	NW	1.0.0.1	PMT Gain	94	
APP 1.0.151 DHOP Yes PN FR11+00CMG-102211 PhadSees 222568.1.172 MAC 6C-48.59:11:03:A8 Subret Mer 202568.1.172 Mode US8 Mode Gate Way 202568.1.12 P None Gate Way 202568.1.12 PM None Gate Way 202568.1.12 Version 2400 UPesk 32007 RPaix 3007 Subret Subret	10	1.0.0.151	ADC Offset	-7	
FN FR11+00204AF-102211 JP address 522.568.13.72 MAC 6C-48/9/13.03.A8 Subret May 562.505.0.0 Mode USB Mode Gale Way 562.505.0.0 Res NO Gale Way 52.568.8.1 PM None Bibmit 2400 2400 UPesk 3007 R 90.7	NP	1.0.0.151	OHOP	Yes	
MAC BC-48.59:11:03:A8 Subret Ma Mode US8 Mode Gate Way 525:053:255:0 P None Subret Ma 522:568:3.1 RMM 2400 UPesk 3710 RMM 3807 0	PN	FR11-000UAG-102211	3º address	192.168.1.171	
Mode USB Mode Gate Way Total (18.1) P None BP None BP <	MAC	8C-48:59:11:03:A8	Subnet Mar	255.255.255.0	
Res HD IP None RPM 2400 UPesk 3710 RPesk 3807 RPD 0	Mode	US8 Mode	Gate Way	192.168.1.1	
IP None R9H 2400 LPesk 3710 R9esk 3007 R9D 0	Res	10			
RPH 2400 LPesk 3710 RPesk 3607 RPD 0	P	None			
LPesk 3710 RPesk 3607 RPD 0	RPM	2400			
RPeak 3007 RFD 0	LPeak	3710			
R/10 0	RPeak.	3807			
	RFID	0			

9. Repeat the procedure until the readout value is within the blank scan calibration tolerance, then continue onto **PMT gain verification and adjustment**.

PMT gain verification and adjustment

- 1. Expose the IP with **1100µGy**, position it on the tray and close it to scan on the low scan position.
- 2. Compare the readout value to the tolerance for the high dose calibration.

	Device Calibration
	The X-lay beam should cover the entire IP area. needs sizek: IP & HO Resolution
	Coloriton
Low dose scan	Sortlink Sortlindee Sortliber Sortliber
readout value	► 224 2683 13723 42340
readout value.	(10-500) (1500-5000) (1000-5000) (1000-5000) (10000-50000) (10000-50000) (10000-50000) (10000-50000) (10000-50000) (10000-50000) (10000-50000) (10000-50000) (10000-500000) (10000-500000) (10000000000000) (100000000000000
	Canad

- If the readout value is within the tolerances for the high dose calibration, continue onto **Scanner calibration**.
- If the readout value is outside the high dose calibration tolerances, open the scanner control panel and check the box next to the "Edit Params" label.

Multi	The second se		and and a state	
Roos	THOSE DEVEL	NOX	norma une	
NW	1.0.0.1	PMT Gan	94	
18	1.0.0.151	ADC Offset	-7	
NP	1.0.0.151	OHCP	Yes	
PN	FR11-000LAG-102211	3º address	192,168.1.171	
MAC	8C:48:59:11:03:A8	Subnet Mar	255,255,255.0	
Mode	US8 Mode	Gate Way	192.168.1.1	
Res	HD			
P	None			
RPM	2400			
LPeak.	3710			
RPeak	3807			
R/10	0			

• Adjust the value next to the label "PMT gain". Increasing the value will increase the gain resulting in a higher readout value on the next scan. Decreasing the value will lower the gain resulting in a lower readout value on the next scan.

needon ly i	parameters	Contable s	araneters		
Model	FreCR Dental	Nick	normal unit		
NW	1.0.0.1	PMT Gain	94		— PMT Gair
51	1.0.0.151	ADC Offset	-7		i ini oun
APP .	1.0.0.151	OHOP	Yes		
PN	FR11-000LAG-102211	3 ^p address	192,168,1,171		
MAC	8C:48:59:11:03:A8	Subnet Mar	255,255,255,0		
Mode	US8 Mode	Gate Way	192.168.1.1		
Res	HD				
P	None				
RPM	2400				
UPeak	3710				
RPeak	3607				
RFID	0				
		🗌 tidt para	neters		
		Reset Scane	et Save Parans	Close	

• Once the value has been altered, click on the button labeled "Save Params". A dialog will appear asking you to switch the unit off, close the software, switch the unit on and reopen the software.

241.4.4	and the second se	Conception 1		
Model	Freix Dertal	NOX.	normalunit	
HW	1.0.0.1	PHT Gan	94	
10	1.0.0.153	ADC Offset	.7	
APP	1.0.0.151	OHOP	Yes	
PN	FR11-000LAG-102211	3P address	192,168.1.171	
MAC	8C-48:59:11:03:A8	Subnet Mas	255,255,255,0	
Mode	US8 Mode	Gate Way	192.168.1.1	
Res	HD			
P	None			
RPM	2400			
LPeak.	3710			
RPeak	3807			
RFID	0			

3. Repeat the procedure until the readout value is within the high dose calibration tolerance, then continue onto **Scanner calibration**.

Scanner calibration

To calibrate the FireCR Dental you will need an IP size 4C, a generator and preferably a dosimeter.

Before calibrating ensure that the unit is scanning with **HD** resolution by looking in the top of the LCD display on the unit.



If the unit is scanning with **SD** resolution, enter the settings menu by pressing on the cog wheel on the LCD display of the unit.



Select the **Resolution** field.



Select **High Resolution** (1) and then use the back button (2) on the LCD display to go back one step.



Press the back button again to exit the settings menu.



 Enter the calibration menu as described in the user manual for your software. For Quantor users use the options icon (1) in the top right hand corner and select "Device calibration" (2).



- 2. Follow the on screen guide to calibrate the unit using the following dose for each step;
 - Blank = 0µGy
 - Low dose = 70μ Gy
 - Mid dose = 325µGy
 - High dose = 1100µGy

	The X-ray beam she	ould cover the entire IP	area.
needs size4c IP & F	ID Resolution	Upicad	Download
Erase			Calbration
ScanBlank	ScanLowDose	ScanMidDose	ScanHighDose
224	2683	13723	42340
(50~500) 0.00kVp 0.00mAs SID 280 mm	(1500~5000) 70.00kVp 0.49mAs SID 280 mm	(8000~16000) 70.00kVp 1.40mAs SID 280 mm	(30000~45000) 70.00kVp 3.50mAs SID 65280 mm

3. Select **Calibration** to complete the calibration.

The X-ray beam should o	over the entire IP area.
needs size4c IP & HD Resolution	Upload Download
Erase	Calbration

4. When the calibration is done a pop up window will confirm that it was successful. Select **OK** to continue.



5. Upload the new calibration data to the unit by selecting **OK**.

update ca	alibation data	8	
0	Do you want to upload Ca	libration data?	
	ОК	Cancel	

6. Select **Yes** to use the new calibration.

Select File	×
0	To upload calibration data of FR11-00DLAG-102211 click [Yes].If you want to upload other file click [No] else It will be Canceled
	Yes No Cancel

7. Select **OK** to start the transfer.

wait for a	while	
0	While transferring data please wait a minutes you can see progress in Display of Scanner after clicking this message transferring will start	
	ОК	

LCD calibration

1. Go to the settings menu using the cog wheel on the LCD display of the unit.



2. Enter the network setting menu.

FireCR Dental NoIP	HD 🔑
Setting	$\supset \frown$
Resolution	
System	
Language	
Network	

3. Select the IP address field.



4. Delete the existing IP address using the backspace button (1) on the display of the unit and enter 5 dots (2). The IP address will be restored automatically when the calibration is finished.



5. Select the check mark on the display of the unit to boot the unit in LCD calibration mode.



6. Press in the center of the 5 crosshairs to calibrate the display.



7. The scanner is now ready for use.

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