

An/To: EDAP TMS, Service department

Kopie/Copy: Hr. Dr. N. Dührßen, R. Kaiser, V. Neumann

Von/From:

G. Stöckman	in	X-Alliance GmbH Suhrenkamp 59-69 22335 Hamburg, Germany	K-Alliance GmbH Fon: Suhrenkamp 59-69 Fax: 22335 Hamburg, Germany	
Seite/Page:	1/9	Ref: XA-00067_11	Datum/D	Date: 09.09.2011

FCO test and calibration procedures X-Pack (Class 3; Service recommendation)

<u>Applies to</u>: Image intensifier, camera lens assembly (CLA) FLXIS

Introduction:

Instructions for calibrating the camera-lens assembly and for checking the image quality.

Manpower / Time to complete:

1 engineer, 1 hour.

Tools and test equipment:

Standard tool set, dose meter, contrast and resolution phantom. Copper filter 1,5mm

Accompanying documentation:

- FLXIS Integration Support Document
- FLXIS Application Guide

X-Alliance GmbH Suhrenkamp 59 - 69 22335 Hamburg – Germany Tel: +49 40 600 88 44 0 Fax: +49 40 600 88 44 44 sales@x-alliance.com www.x-alliance.com General Management: Rolf Kaiser • Dr. Rolf Nic. Duehrssen Registered Office: Hamburg Registr. Court Hmbg • Re. No: HRB 110468 Local tax registration No: 69/200/25985 VAT ID Nr. DE264649245 Bank: Bankhaus Fortmann & Soehne Konto-Nr. 9046800 BLZ 280 303 00 IBAN Code DE6828030300009046800 BIC Code FORTDEH1 Bank: Deutsche Bank Oldenburg Konto-Nr. 55100200 BLZ 280 70024 IBAN Code DE46280700240055100200 BIC Code DEUTDEDB280



Procedure:

Please follow the instructions (extracted from the relevant *FIT tool* documentation) listed below:

<u>Note</u>: As the II-TV subsystem is one part of a complete & complex X-Ray system a performance check can only be performed at "System" level.

2.4 Calibration functionality

The *FITtool* software has integrated calibration functionality that will guide the system integrator/service engineers in optimizing and/or maintaining the FLXIS IITV subsystem to its best performance.

Important: before executing any calibration set the CXA command time-out to 0 (zero) as the response to a number of calibration steps will exceed the "normal" time-out setting of 5000. Changing the value needs to be done in the Preferences window (refer to Figure 8).

FIT Tool			_ 8 ×
a New Help			
品 🗙 🔨 峠 調 🔊 🔊			
abrations: Completed			
Rear No.			
II-7003E INO			
Camera Head centering and horizon No			
II-Diameter No			
Dur (Duruh (ABC simp) No			
Exercit Directate (Hine High at			
Dose / Doserate (AEC signal) No			
California data			
Backup Restore			
Conversions Law			
criaryo Loy Corol			
ady	Connected C	OM1	NUM

Select the "Calibration" button (second from the left).

Figure 18: Main Calibration screen.

<u>Note</u>: when the calibration procedures have not been performed the text next to the *"Calibration"* buttons will indicate "No".

The structure of software is such that it will guide the user in an easy menu driven manner through all calibration steps and also securing the calibration data.

2.4.1 Backup & Restore function

It is good practice that you make a backup of the calibration data *directly* after the FLXIS IITV subsystem has been successfully installed as it comes well calibrated from the factory. This has two great advantages:

Author: G. Stoeckmann Date: 2011.09.09 Ref: XA-00067_11 Replaces: -



You can always go back to the initial calibrated situation. If the Control Board becomes defective, where the calibration data is stored, you have all the calibration data available and do not have to perform the procedure.

Use the Backup & Restore buttons, with underlying standard Windows functionality (Save as... & Open....), to either create a safe backup of the calibration data or return the data to the FLXIS IITV subsystem. The calibration data has the extension .cal so it can be easily recognized.

2.4.2 Change Log Level function

Changing the log level is a very useful function for mainly system integrators during the phase that the FLXIS IITV subsystem is being integrated into the "System" environment. It can also be of help to service engineers when more detailed information is required during diagnostics on the IITV subsystem.

The default log level is 4 (minimal) and should only be changed if required. Note: subsystem performance will decrease when a log level is chosen that requires more "processing" power (levels 0 through 3).

Click on the "Change Log Level" button



Figure 19: Log level selection menu

- Select the desired log level.
- Click on the "OK" button

<u>Important:</u> when the FLXIS IITV subsystem has had a power down/power up cycle, for whatever reason what, the log level is set to the default value (4).

Note: the Control Board has a *"Logging"* output port (connector X4) where another PC can be connected. How to use this port is described in a separate document (refer to Ref 4).

2.4.3 Calibration function & order

ſ

As stated in the introduction of paragraph 2.4 the procedure is menu driven so only a few example screens are shown to give the user an idea what can be expected.

Author: G. Stoeckmann Date: 2011.09.09	Ref: XA-00067_11	Replaces: -	
--	------------------	-------------	--



Please note that one should follow the order of calibrations as is indicated on screen. This implies:

- First II-Focus
- Second Camera Head centering and horizon
- Etc.....

If one decides to skip for example the first calibration step a pop-up will appear warning you about this situation.

FITtool	×
<u>.</u>	II-Focus calibration has not been done. Are you sure you want to start the calibration of the camera head?
	<u>Y</u> es <u>N</u> c

If you are sure just acknowledge by clicking on the "Yes" button or "No" when you want to return to the Calibration screen.

After each calibration step has been successfully performed the status will change from the initial Completed No to Yes.

Below the first screen that one will see when starting the II-Focus calibration.

foc	s calibration	
Ins	ructions	
	temove all objects out of the X-ray beam and set the SID to minmum (if applicable). ∿L a 1.5 mm Cu plate in the X-ray beam and remove extra X-ray filtering in the collima if present).	itor
	select ContinuousFluoroMode, preferable at fixed/low KV's and automatic mA-control.	
AcI	on Click the "Start Calibration" button to start the calibrations. Start Calibration	
	Egit	

Figure 20: First II-Focus calibration screen.

Be informed that there is a dependency between the different calibration steps. For instance it is always required to perform the II-Diameter *after* the II-Focus calibration has been performed. For more information on this subject consult the ISD (Integration Support Document) and/or FLXIS *Test & Calibration* document that can be provided upon request.

During the actual calibration the text will be grayed out and in the newer *FITtool* versions a timer symbol will be displayed.

Author: G. Stoeckmann	Date: 2011.09.09	Ref: XA-00067_11	Replaces: -



Instructions	
Action	
Please wait	(
Start Calibration	
alibrated II-formats:	

At the end of, in this case step 1 of the II-Focus calibration, a follow-up screen is displayed.

• Click on the "Continue" button to proceed.

cus calibration	
nesuctions	_
Startine existencion of II forma: 230.1 mm	
olon Click the "Continue" button. Tortin.e Ib a.w. I f.a. nata	
<u></u>	
nos calibration	
ACT VAIDE ACT VAITE FULORO Adjust system conditions during Flucto. Position (namually or ay arrows control, the shuttery) of the X-ray collimator outrice the K-ray mage. I chair displayed on the monitor. When ready clock the "Continue" outcom	
olion Click the "Continue" button.	
Cortinuc	
Ibrane: IH:smaltx	

Take the appropriate actions as described in the text within the window.

• Click on the "Continue" button to proceed.



Instructions	
Calibration for II format 220.1 has been finished. DEACTIVATE FLUORIO.	
Action click "Continue" button.	
Continue	
Calibrated II-formats:	
	Egit

Follow on screen information

Instructions	
Starting calibration of II format 164.7 mm.	
Action Click the "Continue" button.	
Continue	
alibrated II-formats: 220.1 mm	

Instructions	
ACTIVATE FLUORO. Adjust system conditions (Position (manually or by re Vice) image. Hot is deala	during Fluoro. emote control) the shutter(s) of the X-ray collimator outside the used on the control.
When ready click the "Co	pool of the monitor. ontinue'' button.
Action Click the "Continue	" button.
Lonanue	
alibrated II-formats: 220.1 mm	
	Exit
	E ₂₀ t
a source and the	

Calibration for II-format 164.7 has been finished.	
DEACTIVATE FLUORO.	
Action click "Continue" button.	
Continue	
-Bastad II (amata 220.1 am	
andraide informats. 220.1 min	



Instructions	
Starting calibration of II format 138.6 mm.	
A = 1/	
Click the "Continue" button.	
Continue	
Shratad U formato: 220.1 mm, 164.7 mm	
subaced informers, 220,1 min 104,7 min	
	Egit

ACTIVA Adjustisj Position X-ray imi	TE FLUORO. Istem conditions (manually or by re age, that is displa	during Fluoro. amote control) the shu yed on the monitor.	itter(s) of the X-ray co	llimator outside the
Whon re	ady click the "Co	ontinue" button.		
Action Click t	he "Continue	" button.		
0	ontinue			
librated II-fi	ormats: 220.1 mm	n 164.7 mm		

I-focus calibration	
Instructions Calibration for II format 135.5 has been Inished. DEACTIVATE FLUDRO.	
Action click "Continue" button.	
Calibrated II-formats: 220.1 mm 164.7 mm	
	Egit

Instructions	
Calibration done. Results must be stored.	
Action	
Click "Continue" to store the calibration results.	
Lontinue	
alibrated II formate: 220.1 mm, 154.7 mm, 135.6 mm	
and a second s	
	Exit

Once all steps have been successfully performed the calibration data must be stored in the FLXIS IITV subsystem.



Instructions	
Finished.	
Action Click the "Exit" button.	
albrated II-formate: 220.1 mm 164.7 mm 136.6 mm	

Click on the *"Exit"* button to finish.

<u>Note</u>: in this example it concerns a *23cm* three II-sizes FLXIS IITV subsystem but for <u>some</u> *31cm* configurations there is also a fourth II size available.

RUT FIT Tool				_ 8 ×
Ele Yew Help				
128 📈 🛫 📥 🏹 🛷 🛷 🖉 🎾	ę			
Calibrations: Ca	smpleted			
II-Focus	Yes			
Camera Head centering and horizon	No			
II-Diameter	No			
Dose / Doserate (ABC signal)	No			
Dose / Doserate (AEC signal)	No			
Calibration data Backup Pestore				
Change Log Level				
Ready		Connected	COM1	NUM

Figure 21: Calibration screen after II-Focus calibration is completed.

<u>Note</u>: the Indication behind the II-Focus button has now changed to Yes to indicate that the calibration is successfully completed. Perform all the calibration steps from the list. The procedure is identical, from the structure point of view, as for the II-Focus procedure.

<u>Note</u>: Dose/Dose rate (AEC signal) is only applicable for Exposure type subsystems.

Important: when all calibration steps have been performed set the CXA command time-out value back to the initial value of 5000 (refer to Figure 8).

If a calibration step fails, it will be clearly displayed on the screen. Check if all pre-conditions are met and retry the appropriate calibration step.

Author: G. Stoeckmann Date: 2011.09.	09 Ref: XA-00067_11	Replaces: -	
--------------------------------------	---------------------	-------------	--



The service engineer needs to be aware, that the calibration of the "Dose / Dose rate (ABC signal)" takes longer time than the other calibration steps. It can take several minutes to come to a positive calibration result.

Once the calibration has been successfully completed, a final test of spatial resolution and contrast performance is recommended.

Also the dose rate should be determined; a typical value for the entrance dose rate without grid is 270nGy/s.

Due to variations of the II's conversion factor, values between 250nGy/s and 300nGy/s are normal.

The dose rate will increase with anti scatter grid in place. Values between 300nGy/s and 350nGy/s are sufficient.

Please refer also to accompanying documentation:

- FLXIS Integration Support Document
- FLXIS Application Guide

Author: G. Stoeckmann	Date: 2011.09.09	Ref: XA-00067_11	Replaces: -