

# TECHNICAL NOTE 42 FS430M & FS530C PV3 BATTERY UPGRADE

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## Table of contents

<b>1. ACRONYM .....</b>	<b>2</b>
<b>2. GENERAL INFORMATION .....</b>	<b>2</b>
<b>3. CONTEXT .....</b>	<b>3</b>
<b>3.1. NEEDED EQUIPMENTS/INSTRUCTIONS .....</b>	<b>5</b>
<b>4. INSTRUCTION .....</b>	<b>6</b>
<b>4.1. ACCESSING PV3 IN FS530C .....</b>	<b>6</b>
<b>4.2. ACCESSING PV3 IN FIBROSCAN 430 .....</b>	<b>9</b>
<b>4.3. UPGRADING THE PV3 CLOCK BATTERY .....</b>	<b>17</b>
<b>5. FUNCTIONAL CHECK .....</b>	<b>21</b>

## 1. ACRONYM

The following abbreviations are used in the document:

- ✓ FS530C stands for FibroScan 530 Compact.
- ✓ FS430M stands for FibroScan 430 Mini.

## 2. GENERAL INFORMATION

Please note that only trained and ECHOSENS certified service engineers are authorized to open and troubleshoot FibroScan as taught in this document.

Explanations of FS530C inner electronic can be found on E320M003\_2\_TechnicalmanualFibroScan530 distributed at the end of ECHOSENS service trainings.

Explanations of FS430M inner electronic can be found on E330M005\_1\_TechnicalmanualFibroScan430 distributed at the end of ECHOSENS service trainings.

### 3. CONTEXT

It has been highlighted that FS430M and FS530C produced before April 2017 would end up with a loss of date and time parameter within approximately 12 months of functioning. The symptoms of this malfunction are a probe recalibration needed and the FibroScan date showing 01/01/2010.

As a consequence a replacement of the button cell battery by a dedicated kit has to be performed, this shall happen before the failure is effective. Given that the devices have to be opened during the preventive maintenance it could be a good opportunity to perform the fix. Underneath tables including the estimated failure date.

#### **FS530C**

S/N FS530	time loss										
F80011	22/02/2017	F80043	22/04/2017	F80075	24/05/2017	F80107	25/07/2017	F80139	07/02/2018	F80171	24/10/2017
F80012	29/01/2017	F80044	22/04/2017	F80076	01/06/2017	F80108	26/07/2017	F80140	07/02/2018	F80172	24/10/2017
F80013	19/02/2017	F80045	20/04/2017	F80077	01/06/2017	F80109	08/08/2017	F80141	26/09/2017	F80173	27/10/2017
F80014	29/01/2017	F80046	20/05/2017	F80078	08/06/2017	F80110	05/08/2017	F80142	28/09/2017	F80174	27/10/2017
F80015	01/02/2017	F80047	02/06/2017	F80079	08/06/2017	F80111	05/08/2017	F80143	26/09/2017	F80175	27/10/2017
F80016	18/02/2017	F80048	02/05/2017	F80080	23/03/2017	F80112	05/08/2017	F80144	28/09/2017	F80176	27/10/2017
F80017	08/02/2017	F80049	19/04/2017	F80081	30/12/2017	F80113	26/08/2017	F80145	27/09/2017	F80177	28/10/2017
F80018	20/02/2017	F80050	05/05/2017	F80082	15/08/2017	F80114	02/08/2017	F80146	06/10/2017	F80178	30/12/2017
F80019	18/02/2017	F80051	20/04/2017	F80083	24/06/2017	F80115	10/08/2017	F80147	06/10/2017	F80179	31/10/2017
F80020	01/02/2017	F80052	21/04/2017	F80084	28/06/2017	F80116	12/08/2017	F80148	06/10/2017	F80180	02/11/2017
F80021	01/03/2017	F80053	23/05/2017	F80085	30/06/2017	F80117	26/08/2017	F80149	06/10/2017	F80181	10/01/2018
F80022	01/03/2017	F80054	23/05/2017	F80086	30/06/2017	F80118	06/09/2017	F80150	13/10/2017	F80182	13/02/2018
F80023	01/03/2017	F80055	23/05/2017	F80087	30/06/2017	F80119	06/09/2017	F80151	13/10/2017	F80183	03/11/2017
F80024	02/03/2017	F80056	23/05/2017	F80088	27/06/2017	F80120	06/09/2017	F80152	13/10/2017	F80184	03/11/2017
F80025	04/03/2017	F80057	23/05/2017	F80089	23/06/2017	F80121	07/09/2017	F80153	13/10/2017	F80185	04/11/2017
F80026	09/03/2017	F80058	23/05/2017	F80090	21/06/2017	F80122	16/09/2017	F80154	13/10/2017	F80186	10/11/2017
F80027	08/03/2017	F80059	30/05/2017	F80091	23/06/2017	F80123	16/09/2017	F80155	20/10/2017	F80187	07/11/2017
F80028	15/03/2017	F80060	27/05/2017	F80092	23/06/2017	F80124	16/09/2017	F80156	20/10/2017	F80188	07/11/2017
F80029	16/03/2017	F80061	27/05/2017	F80093	23/06/2017	F80125	16/09/2017	F80157	20/10/2017	F80189	07/11/2017
F80030	18/03/2017	F80062	30/12/2017	F80094	23/06/2017	F80126	19/09/2017	F80158	20/10/2017	F80190	08/11/2017
F80031	24/03/2017	F80063	27/05/2017	F80095	05/07/2017	F80127	19/09/2017	F80159	20/10/2017	F80191	08/11/2017
F80032	22/03/2017	F80064	27/05/2017	F80096	05/07/2017	F80128	19/09/2017	F80160	20/10/2017	F80192	24/06/2017
F80033	25/04/2017	F80065	27/05/2017	F80097	15/11/2017	F80129	19/09/2017	F80161	20/10/2017	F80193	12/01/2018
F80034	05/04/2017	F80066	27/05/2017	F80098	13/07/2017	F80130	19/09/2017	F80162	20/10/2017	F80194	16/01/2018
F80035	05/04/2017	F80067	27/05/2017	F80099	29/09/2017	F80131	22/09/2017	F80163	09/01/2018	F80195	14/02/2018
F80036	05/04/2017	F80068	27/05/2017	F80100	29/09/2017	F80132	22/09/2017	F80164	09/01/2018	F80196	03/02/2018
F80037	29/03/2017	F80069	27/05/2017	F80101	24/08/2017	F80133	22/09/2017	F80165	25/10/2017	F80197	09/03/2018
F80038	29/03/2017	F80070	23/05/2017	F80102	02/11/2017	F80134	07/09/2017	F80166	27/10/2017	F80198	10/11/2017
F80039	29/03/2017	F80071	23/05/2017	F80103	18/10/2017	F80135	23/09/2017	F80167	14/12/2017	F80199	14/02/2018
F80040	29/03/2017	F80072	23/05/2017	F80104	14/11/2017	F80136	27/09/2017	F80168	17/01/2018	F80200	14/02/2018
F80041	29/03/2017	F80073	26/05/2017	F80105	16/11/2017	F80137	26/09/2017	F80169	17/01/2018	F80201	16/11/2017
F80042	29/03/2017	F80074	26/05/2017	F80106	25/07/2017	F80138	07/02/2018	F80170	24/10/2017	F80202	17/11/2017

S/N FS530	time loss										
F80203	16/11/2017	F80235	27/02/2018	F80267	05/01/2018	F80299	04/04/2018	F80331	20/03/2018	F80363	23/03/2018
F80204	17/11/2017	F80236	01/03/2018	F80268	05/01/2018	F80300	07/04/2018	F80332	06/03/2018	F80369	27/03/2018
F80205	17/11/2017	F80237	09/02/2018	F80269	05/01/2018	F80301	06/04/2018	F80333	22/09/2017		
F80206	21/11/2017	F80238	02/03/2018	F80270	05/01/2018	F80302	20/02/2018	F80334	08/03/2018		
F80207	18/11/2017	F80239	14/12/2017	F80271	05/01/2018	F80303	07/04/2018	F80335	09/03/2018		
F80208	22/11/2017	F80240	14/12/2017	F80272	05/01/2018	F80304	20/02/2018	F80336	09/03/2018		
F80209	24/01/2018	F80241	14/12/2017	F80273	05/01/2018	F80305	07/04/2018	F80337	09/03/2018		
F80210	13/12/2017	F80242	14/12/2017	F80274	05/01/2018	F80306	07/04/2018	F80338	09/03/2018		
F80211	22/12/2017	F80243	14/12/2017	F80275	13/01/2018	F80307	07/04/2018	F80339	09/03/2018		
F80212	20/12/2017	F80244	14/12/2017	F80276	13/01/2018	F80308	07/04/2018	F80340	09/03/2018		
F80213	23/12/2017	F80245	14/12/2017	F80277	13/01/2018	F80309	11/04/2018	F80341	09/03/2018		
F80214	20/12/2017	F80246	16/12/2017	F80278	13/01/2018	F80310	21/02/2018	F80342	09/03/2018		
F80215	29/12/2017	F80247	16/12/2017	F80279	13/01/2018	F80311	21/02/2018	F80343	10/03/2018		
F80216	30/12/2017	F80248	16/12/2017	F80280	13/01/2018	F80312	24/02/2018	F80344	10/03/2018		
F80217	29/12/2017	F80249	16/12/2017	F80281	23/02/2018	F80313	22/02/2018	F80345	13/03/2018		
F80218	12/01/2018	F80250	16/12/2017	F80282	23/01/2018	F80314	23/02/2018	F80346	13/03/2018		
F80219	01/12/2017	F80251	15/12/2017	F80283	24/01/2018	F80315	23/02/2018	F80347	13/03/2018		
F80220	01/12/2017	F80252	15/12/2017	F80284	01/02/2018	F80316	01/03/2018	F80348	14/03/2018		
F80221	02/12/2017	F80253	15/12/2017	F80285	02/02/2018	F80317	01/03/2018	F80349	23/03/2018		
F80222	02/12/2017	F80254	16/12/2017	F80286	07/02/2018	F80318	01/03/2018	F80350	14/03/2018		
F80223	05/12/2017	F80255	16/12/2017	F80287	07/02/2018	F80319	06/03/2018	F80351	14/03/2018		
F80224	06/12/2017	F80256	16/12/2017	F80288	08/02/2018	F80320	02/03/2018	F80352	14/03/2018		
F80225	06/12/2017	F80257	16/12/2017	F80289	07/02/2018	F80321	02/03/2018	F80353	14/03/2018		
F80226	07/12/2017	F80258	19/12/2017	F80290	07/02/2018	F80322	02/03/2018	F80354	15/03/2018		
F80227	07/12/2017	F80259	21/12/2017	F80291	08/02/2018	F80323	02/03/2018	F80355	21/03/2018		
F80228	06/12/2017	F80260	23/12/2017	F80292	04/04/2018	F80324	02/03/2018	F80356	20/03/2018		
F80229	06/12/2017	F80261	28/12/2017	F80293	04/04/2018	F80325	02/03/2018	F80357	20/03/2018		
F80230	06/12/2017	F80262	28/12/2017	F80294	06/04/2018	F80326	02/03/2018	F80358	20/03/2018		
F80231	06/12/2017	F80263	28/12/2017	F80295	06/04/2018	F80327	02/03/2018	F80359	20/03/2018		
F80232	24/01/2018	F80264	28/12/2017	F80296	06/04/2018	F80328	03/03/2018	F80360	20/03/2018		
F80233	10/02/2018	F80265	05/01/2018	F80297	14/03/2018	F80329	16/03/2018	F80361	20/03/2018		
F80234	08/02/2018	F80266	05/01/2018	F80298	23/03/2018	F80330	17/03/2018	F80362	23/03/2018		

## FS430M

S/N FS430	time loss	S/N FS430	time loss	S/N FS430	time loss
F90031	09/09/2017	F90080	09/09/2017	F90129	09/09/2017
F90032	09/09/2017	F90081	09/09/2017	F90130	09/09/2017
F90033	21/09/2017	F90082	21/09/2017	F90131	21/09/2017
F90034	09/09/2017	F90083	09/09/2017	F90132	09/09/2017
F90035	09/09/2017	F90084	29/12/2017	F90133	09/09/2017
F90036	09/09/2017	F90085	29/12/2017	F90134	09/09/2017
F90037	09/09/2017	F90086	09/09/2017	F90135	09/09/2017
F90038	14/09/2017	F90087	14/09/2017	F90136	14/09/2017
F90039	14/09/2017	F90088	06/01/2018	F90137	14/09/2017
F90040	16/09/2017	F90089	16/09/2017	F90138	16/09/2017
F90041	17/09/2017	F90090	14/01/2018	F90139	16/09/2017
F90042	28/09/2017	F90091	14/01/2018	F90140	28/09/2017
F90043	28/09/2017	F90092	14/01/2018	F90141	28/09/2017
F90044	28/09/2017	F90093	28/09/2017	F90142	28/09/2017
F90045	28/09/2017	F90094	28/09/2017	F90143	28/09/2017
F90046	28/09/2017	F90095	28/09/2017	F90144	28/09/2017
F90047	28/09/2017	F90096	28/09/2017	F90145	08/03/2018
F90048	27/09/2017	F90097	27/09/2017	F90146	27/09/2017
F90049	10/10/2017	F90098	10/10/2017	F90147	10/10/2017
F90050	04/10/2017	F90099	04/10/2017	F90148	04/10/2017
F90051	25/10/2017	F90100	25/10/2017	F90149	25/10/2017
F90052	25/10/2017	F90101	25/10/2017	F90150	25/10/2017
F90053	25/10/2017	F90102	25/10/2017	F90151	25/10/2017
F90054	25/10/2017	F90103	25/10/2017	F90152	25/10/2017
F90055	25/10/2017	F90104	25/10/2017	F90153	25/10/2017
F90056	21/11/2017	F90105	21/11/2017	F90154	21/11/2017
F90057	21/11/2017	F90106	21/11/2017	F90155	21/11/2017
F90058	21/11/2017	F90107	21/11/2017	F90156	21/11/2017
F90059	22/11/2017	F90108	21/11/2017	F90157	21/11/2017
F90060	22/11/2017	F90109	21/11/2017	F90158	21/11/2017
F90061	30/11/2017	F90110	30/11/2017	F90160	30/11/2017
F90062	30/11/2017	F90111	30/11/2017	F90161	30/11/2017
F90063	30/11/2017	F90112	30/11/2017	F90162	30/11/2017
F90064	01/12/2017	F90113	24/01/2018	F90163	01/12/2017
F90065	02/12/2017	F90114	02/12/2017		
F90066	13/12/2017	F90115	13/12/2017		
F90067	14/12/2017	F90116	14/12/2017		
F90068	14/12/2017	F90117	04/02/2018		
F90069	14/12/2017	F90118	14/12/2017		
F90070	14/12/2017	F90119	14/12/2017		
F90071	14/12/2017	F90120	14/12/2017		
F90072	14/12/2017	F90121	14/12/2017		
F90073	11/01/2018	F90122	11/01/2018		
F90074	07/12/2017	F90123	07/12/2017		
F90075	07/12/2017	F90124	07/12/2017		
F90076	16/12/2017	F90125	16/12/2017		
F90077	16/12/2017	F90126	16/12/2017		
F90078	19/12/2017	F90127	19/12/2017		
F90079	19/12/2017	F90128	19/12/2017		

### 3.1. NEEDED EQUIPMENTS/INSTRUCTIONS

To accomplish the upgrade you will need the following items:

- ✓ M5 Allen Key (for intervention on FS530C).
- ✓ M4 Allen Key, classical for disassembly and 1.48Nm calibrated for reassembly (for intervention on FS430M).
- ✓ M5 Torx screwdriver, classical for disassembly and 2.1Nm calibrated for reassembly (for intervention on FS430M).
- ✓ E330M001.1\_Guide430 to guide you removing FS430M battery, reaching configuration menu and perform an exam.
- ✓ Guide530\_C2 0EUROPE to guide you removing FS530C battery, reaching configuration menu and perform an exam.
- ✓ CR2450N RENATA battery.
- ✓ Fake battery with cable ref E111U115-1.
- ✓ Printed circuit board to hold the CR2450N battery and connect it E111U117\_1.
- ✓ Kapton tape to protect CR2450N battery.
- ✓ LOCTITE AS1701 to secure various components from the kit.

## 4. INSTRUCTION

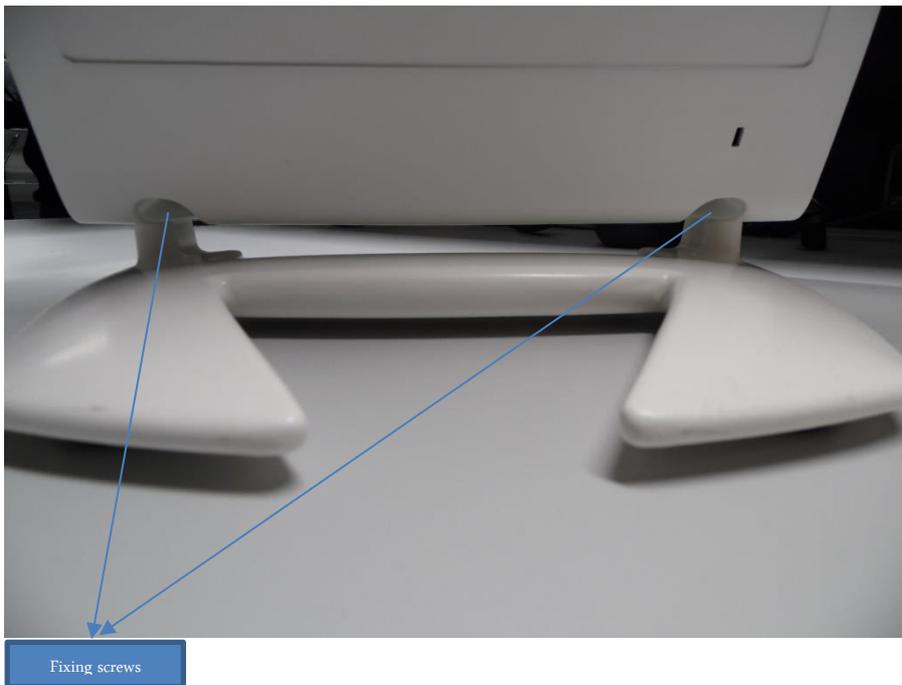
In order to work around this malfunction one has to remove the existing PV3 lithium battery CR1225 and mount an upgrade kit, hereunder the instructions to do so.

### 4.1. ACCESSING PV3 IN FS530C

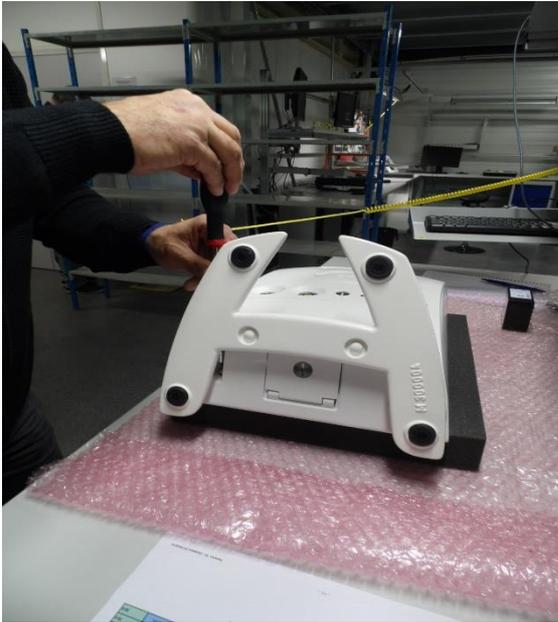
You will need M5 Allen key

 Before any manipulation on the device remove the battery (see chapter 8.3 of "Guide530\_C2 0EUROPE" for details) and make sure main outlet is disconnected.

In order to access the inside of the device one should unscrew the 2 bottom outer screws.



 The LCD screen should always lie on a mellow surface (foam, Manila paper).

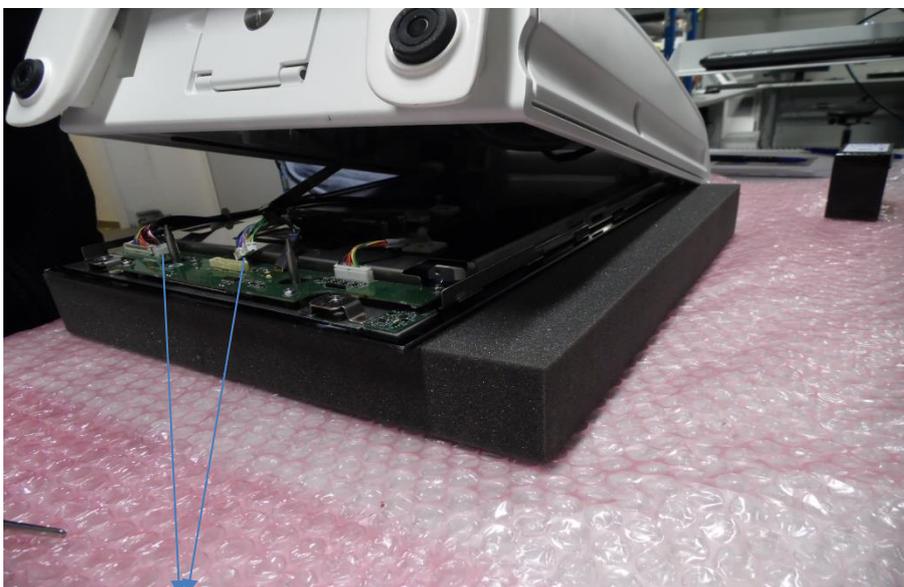


Gently lift up the back cover to remove M300021 (cable from PV3 to cover glass) and ground.

 Remember to press the white nipple on the plastic connector locker to lift it up.

 Make sure to always pull gently the cables away from their connector and do not apply force to avoid damage.

 If the LCD subassembly do not split up easily from the housing , please use a suction lifter placed on the LCD subassembly.



PV3 to coverglass cable and ground

You can now reach for PV3 printed circuit board.  
The reassembly is done following steps above in the opposite way.

## 4.2. ACCESSING PV3 IN FIBROSCAN 430

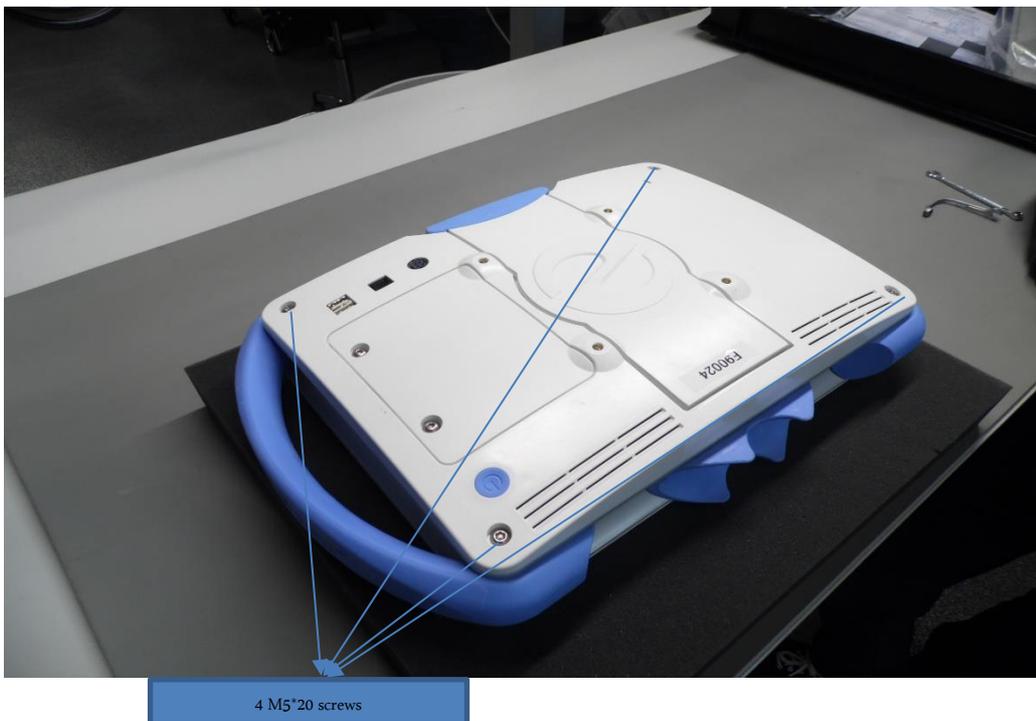
 Before any manipulation on the device remove the battery (see chapter 5.7 of E330M001.1\_Guide430 for details) and make sure main outlet is disconnected.

Note that all screws will have to be retightened with a calibrated screwdriver:

- ✓ M4=1.48 Nm
- ✓ M5=2.1Nm

Remove the 4 M5\*20 screws securing the backcover, you will need an M5 Torx screwdriver.

 The LCD screen should always lie on a mellow surface (foam, Manila paper).



 Make sure to always pull gently the cables away from their connector and do not apply force to avoid damages.

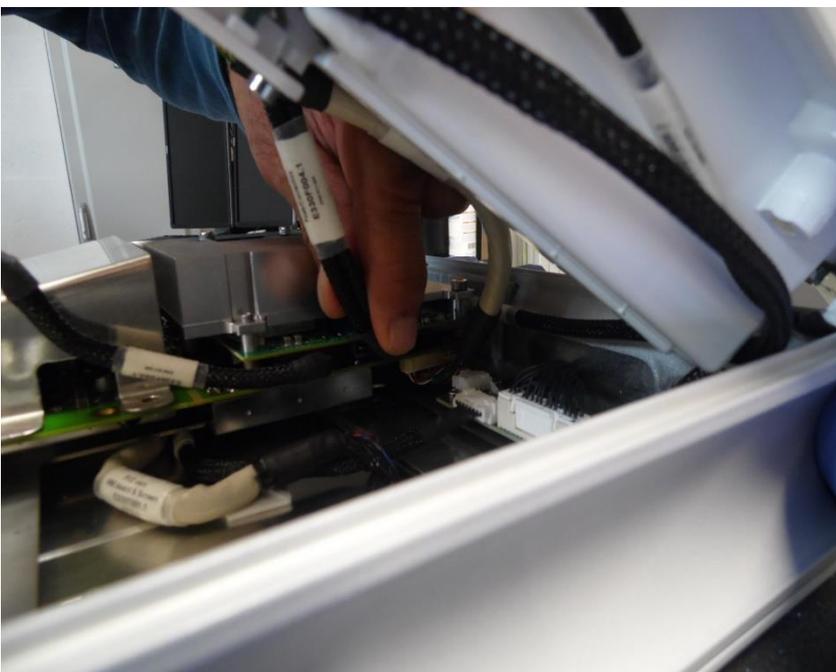
 Remember to unlock the connector by pressing on their base as the risk of break is high.

Gently lift up the back cover and detach the following cables:

- ALIM EE VERS BATTERY (on Power connectics PCB)



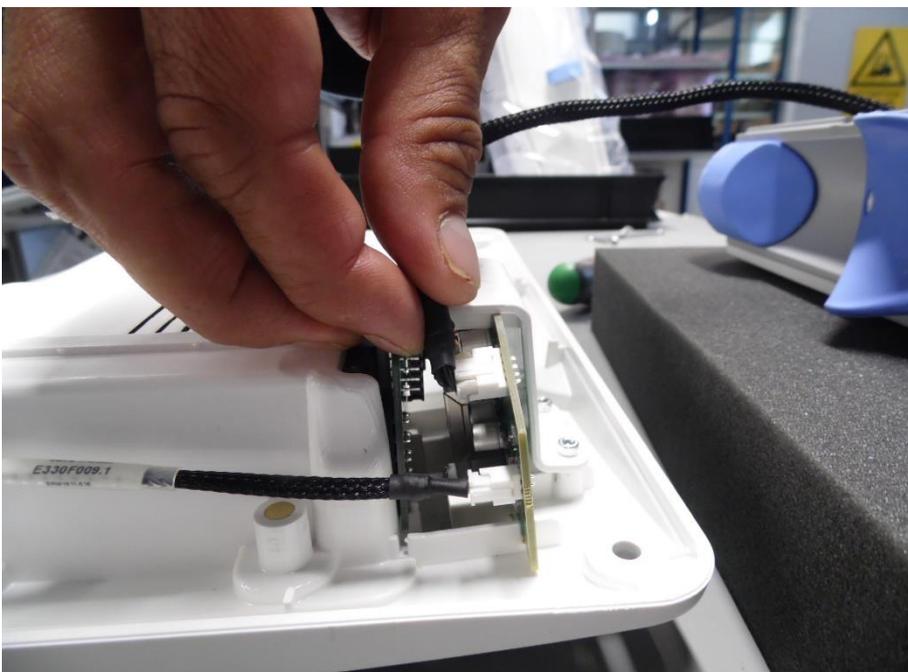
- ALIM EE VERS POWER CONNECTICS (on PV3 PCB)



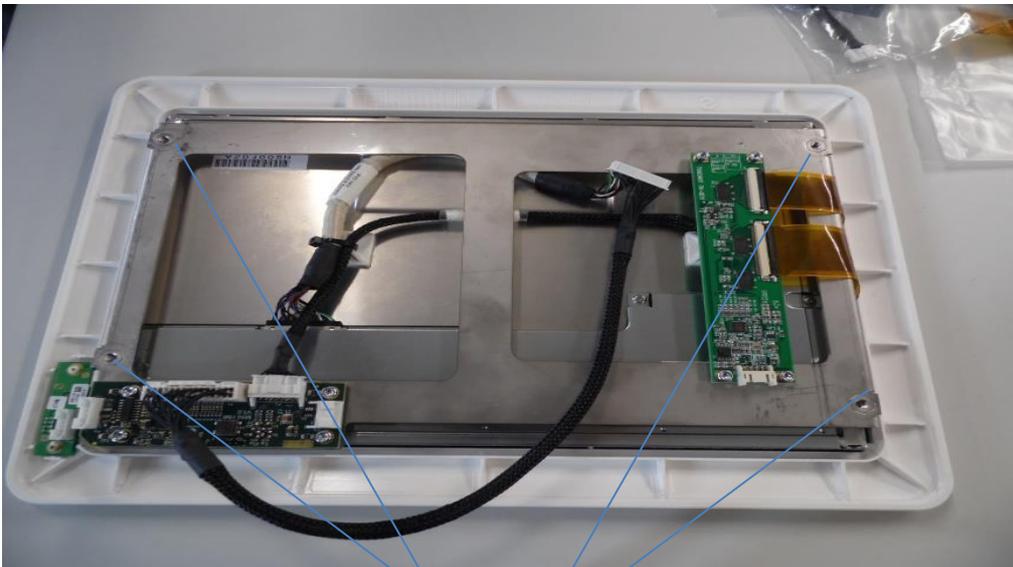
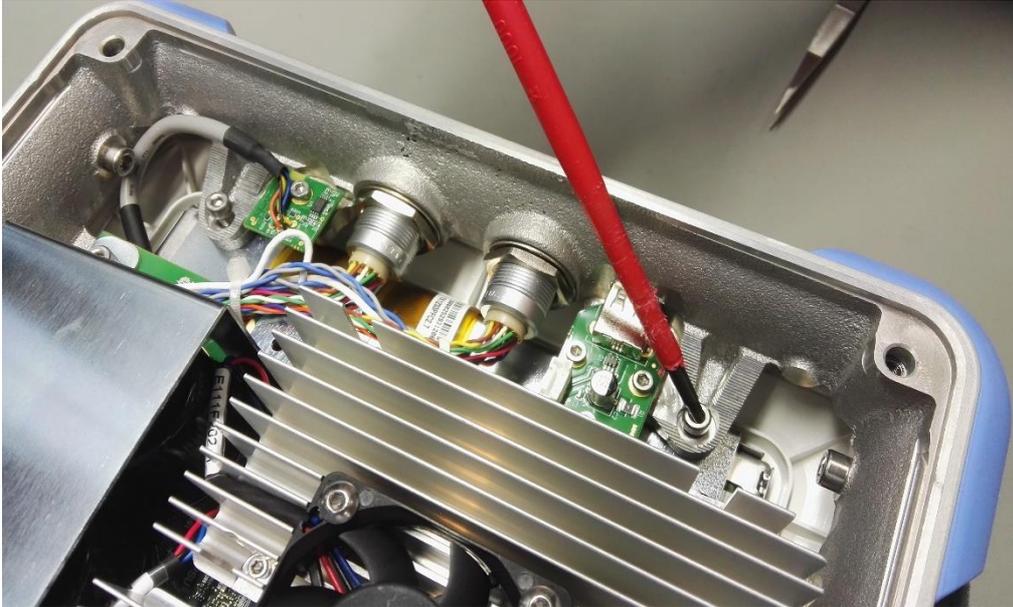
- PV3 VERS POWER CONNECTICS (on POWER CONNECTICS PCB)



- POWER CONNECTICS VERS USB (on POWER CONNECTICS PCB)

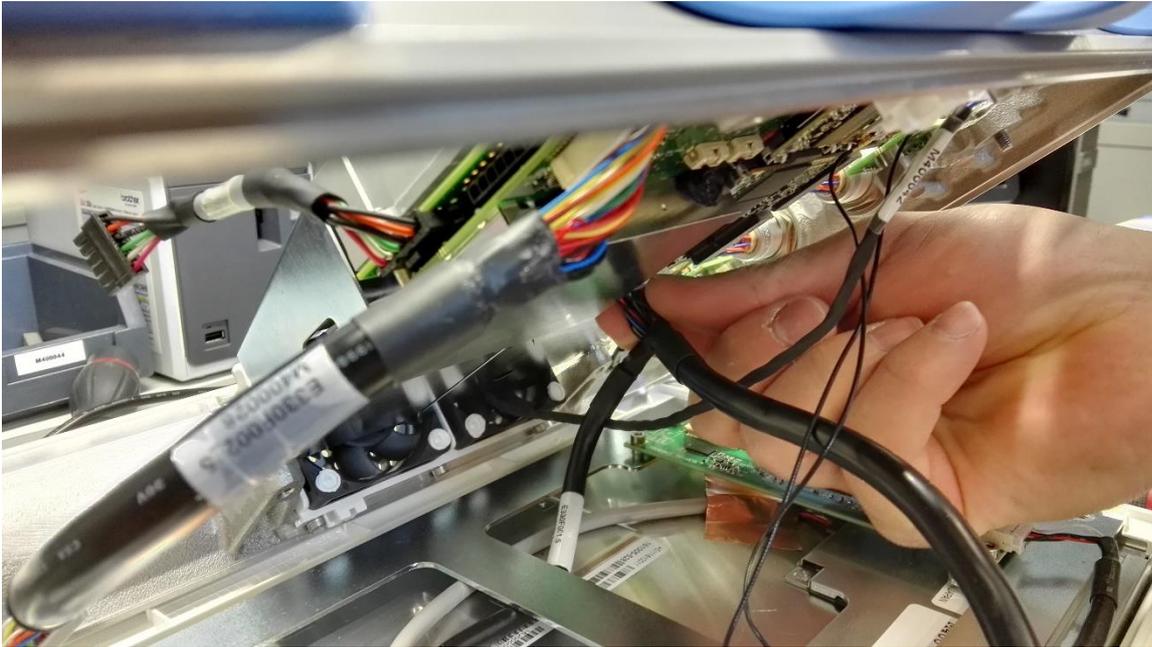


Remove 4 M4\*10 screws and washers holding the screen to the belt  
 You will need an M4 Allen key

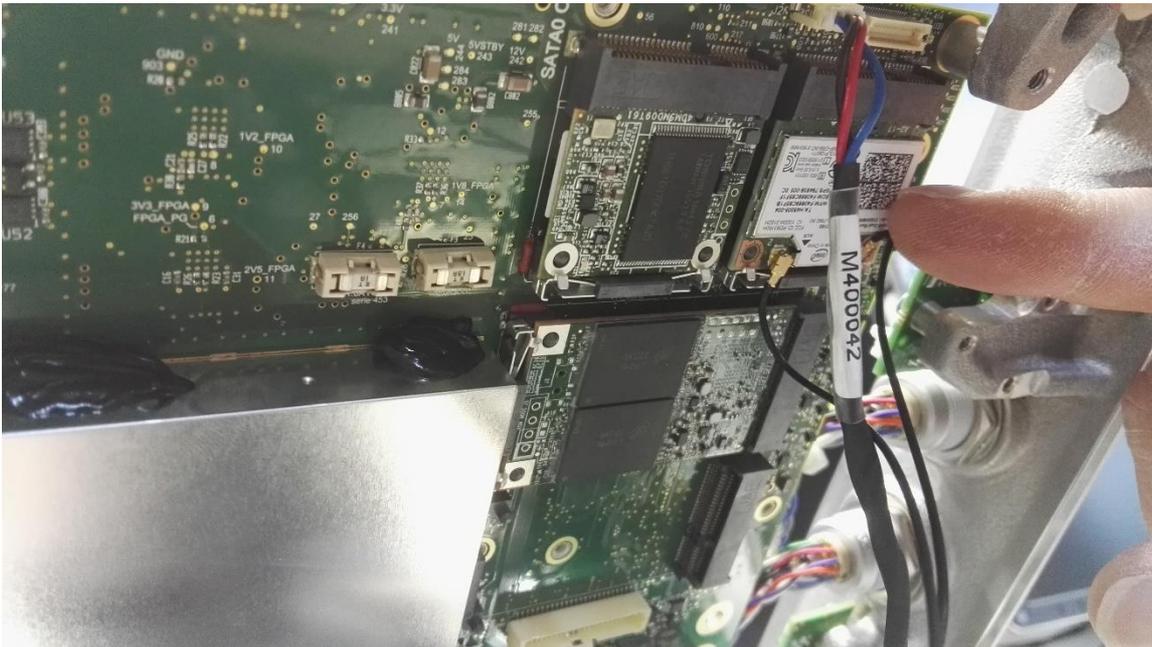


M4\*10 screws

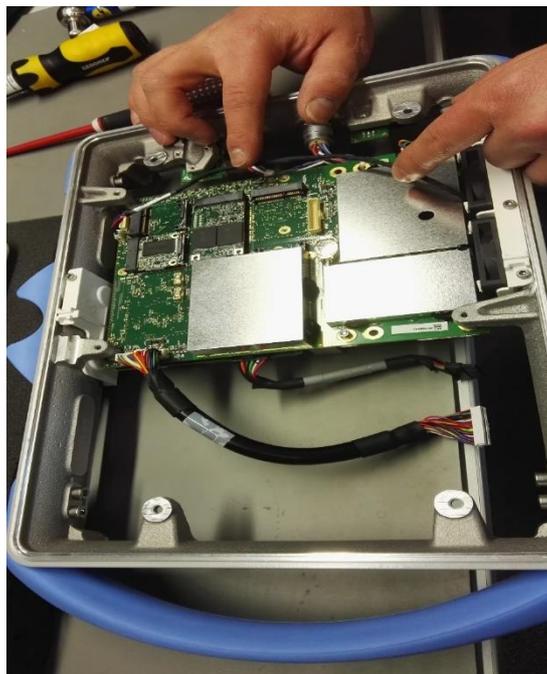
Gently lift up the housing and detach cable M400017 Y LVDS HMI-PV3.



Remove the wifi board



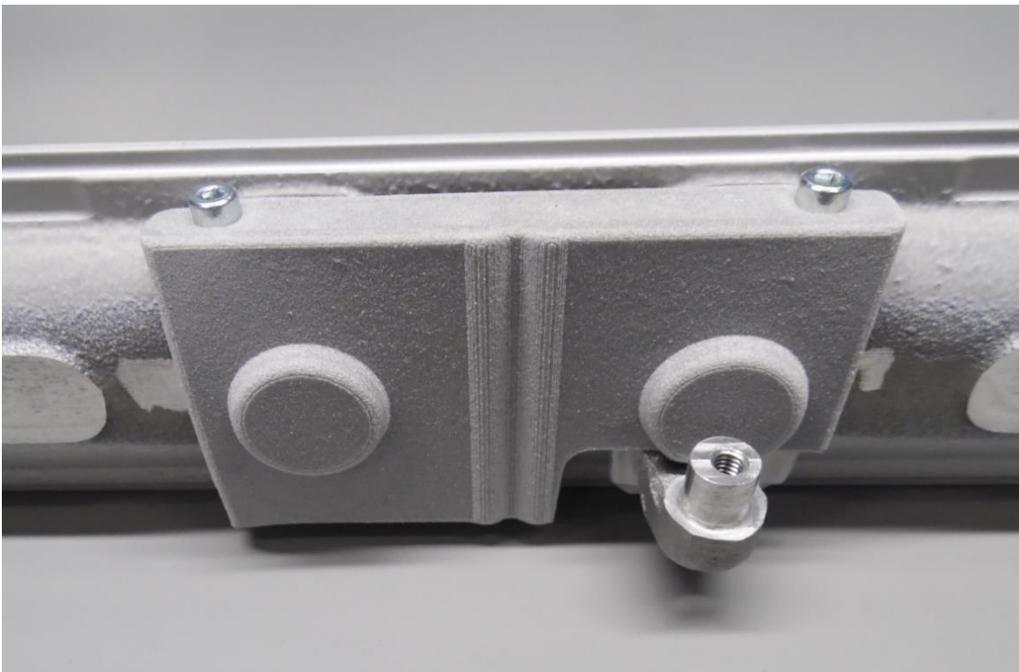
You can now access PV3 printed circuit board.



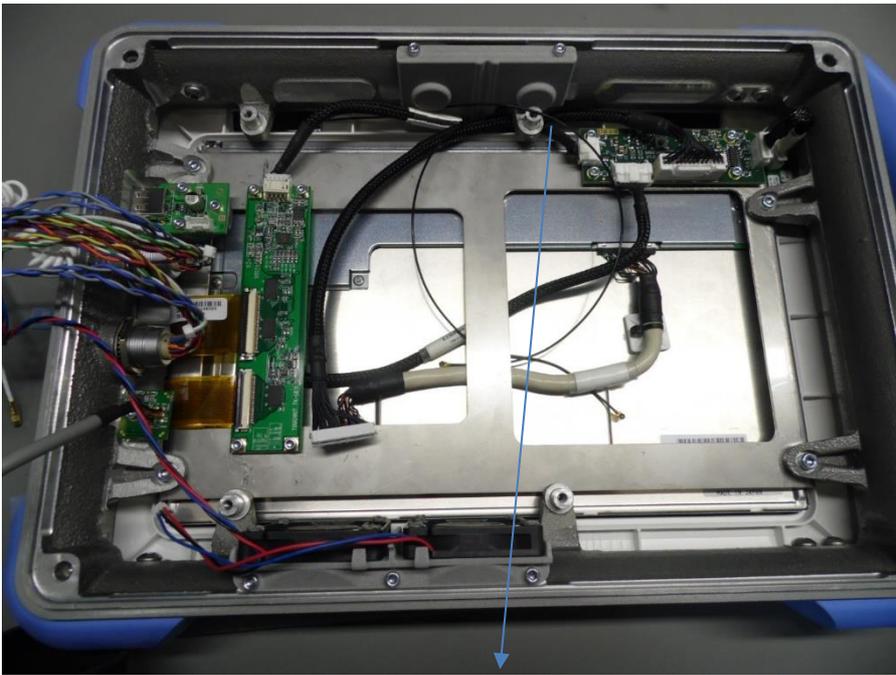
The reassembly is done following steps above in the opposite way.



Pay attention while reconnecting M400017 Y LVDS HMI-PV3 to make sure that it bends underneath the housing magnets support.



Magnet support



Correct bending

### 4.3. UPGRADING THE PV3 CLOCK BATTERY

In order to upgrade the PV3, one will need the following kit:

- ✓ A CR2450N RENATA battery.
- ✓ A fake battery with cable ref E111U120-1.
- ✓ A printed circuit board to hold the CR2450N battery and connect it E111U117\_1.



Remove the existing battery CR1225, replace it with E111U120-1

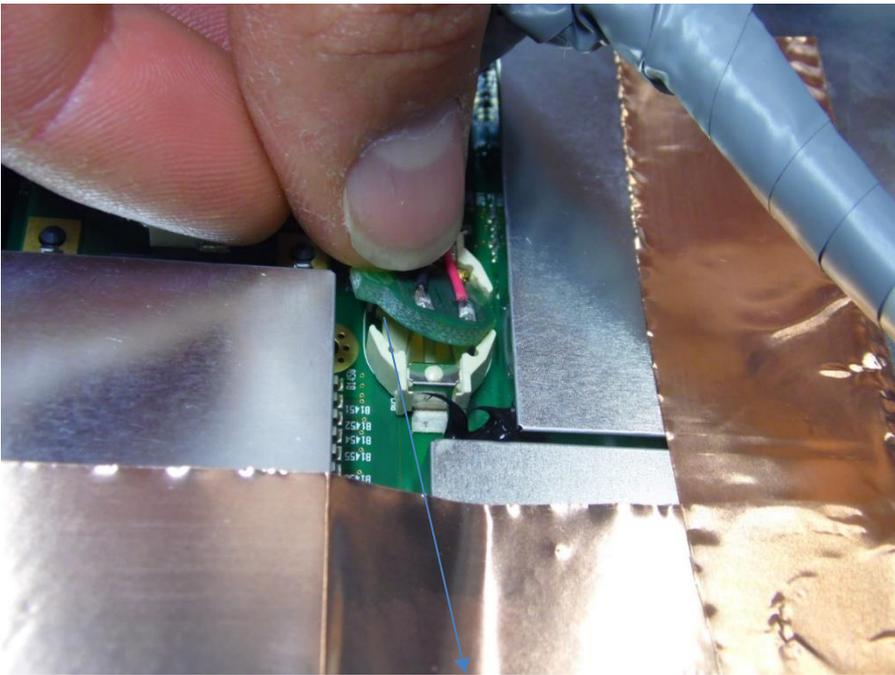


Be careful to place first the copper side on the holder.

Place E111U120-1 at the bottom of the holder.



E111U120-1 keying has to be placed as in the picture below.



keying

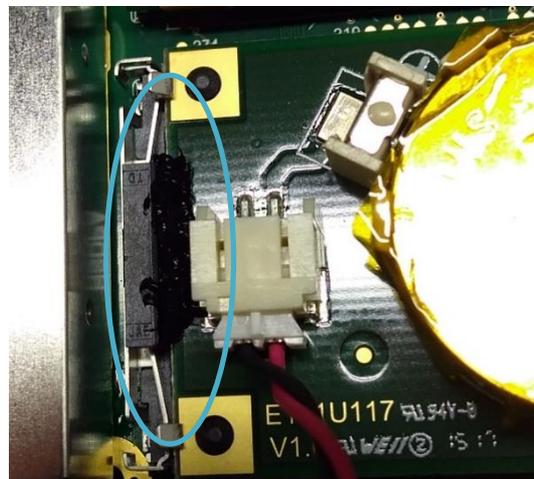
Place E111U117\_1 on the free MSATA holder on the PV3.



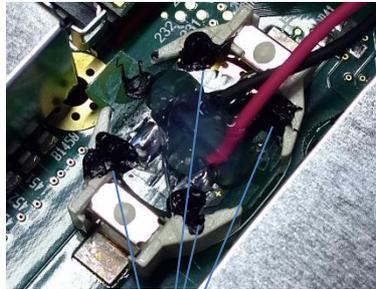
Place the RENATA battery on E111U117\_1.  
 Connect E111U117\_1 and E111U120-1.  
 Protect the RENATA battery with Kapton tape.



Place a string of Silicon type LOCTITE AS1701 along the MSATA holder.



Place 4 dots of Silicon (same type) to secure the E111U120-1 in the holder.



Silicon

## 5. FUNCTIONAL CHECK

Once the modification has been achieved you will have to adjust date and time , in order to do so log on to the configuration menu as "SERVICE" using password "D15TRIB".



Reach for the localization menu and set the correct time settings.

In order to test the modification, switch off the FibroScan remove main power and battery, wait 5 minutes, place the battery back in the device and restart it, check that date and time are still accurate.

Perform an exam and make sure results are relevant.