FireCR spark

Service Manual

FireCR Spark Computed Radiography Reader

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Part No.: CR-FPM-44-016-EN

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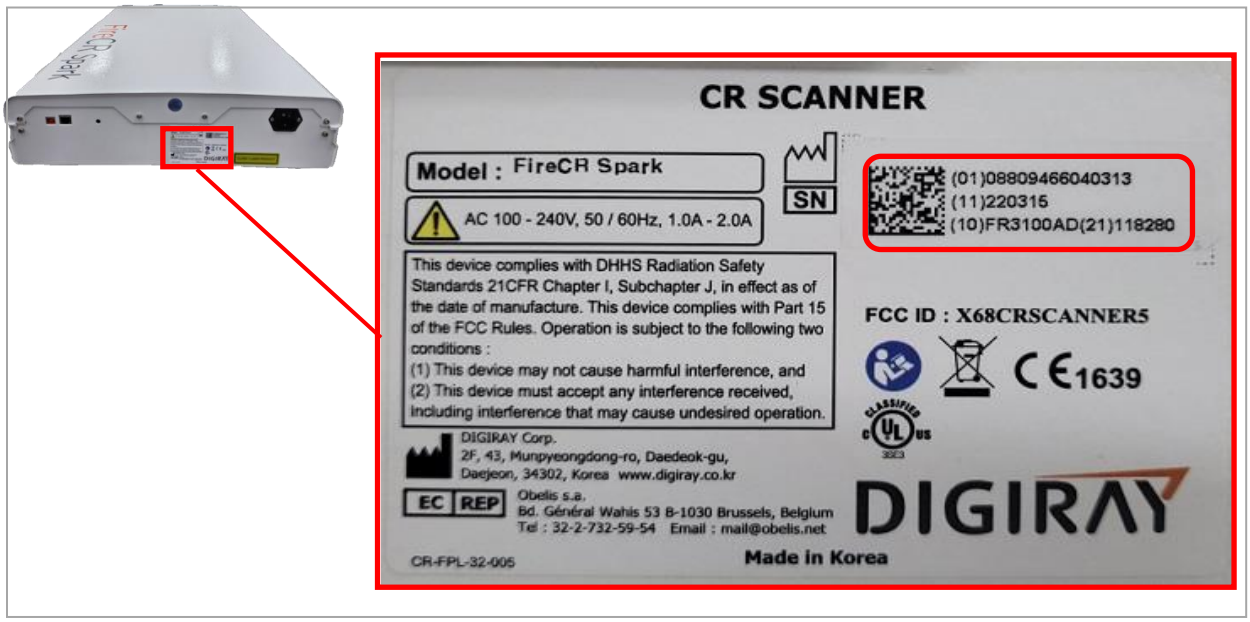
Parts removal/replacement

When ordering parts, please inform the technical supporter the serial number of the unit being repaired.

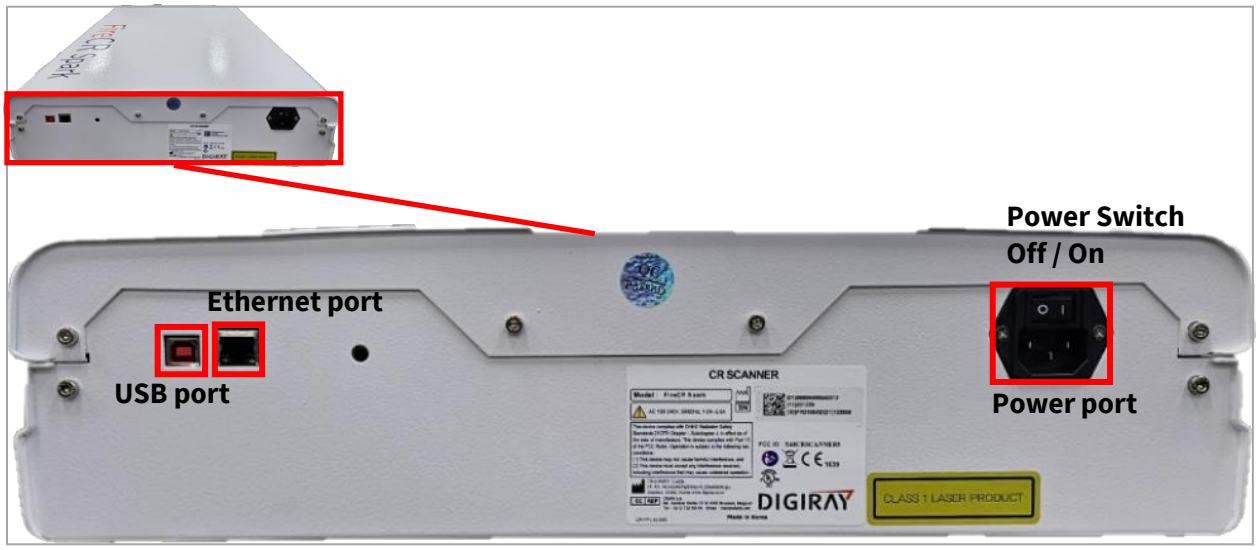
The serial number can be found on the back of the scanner.



Parts removal/replacement

Replacing the top cover.

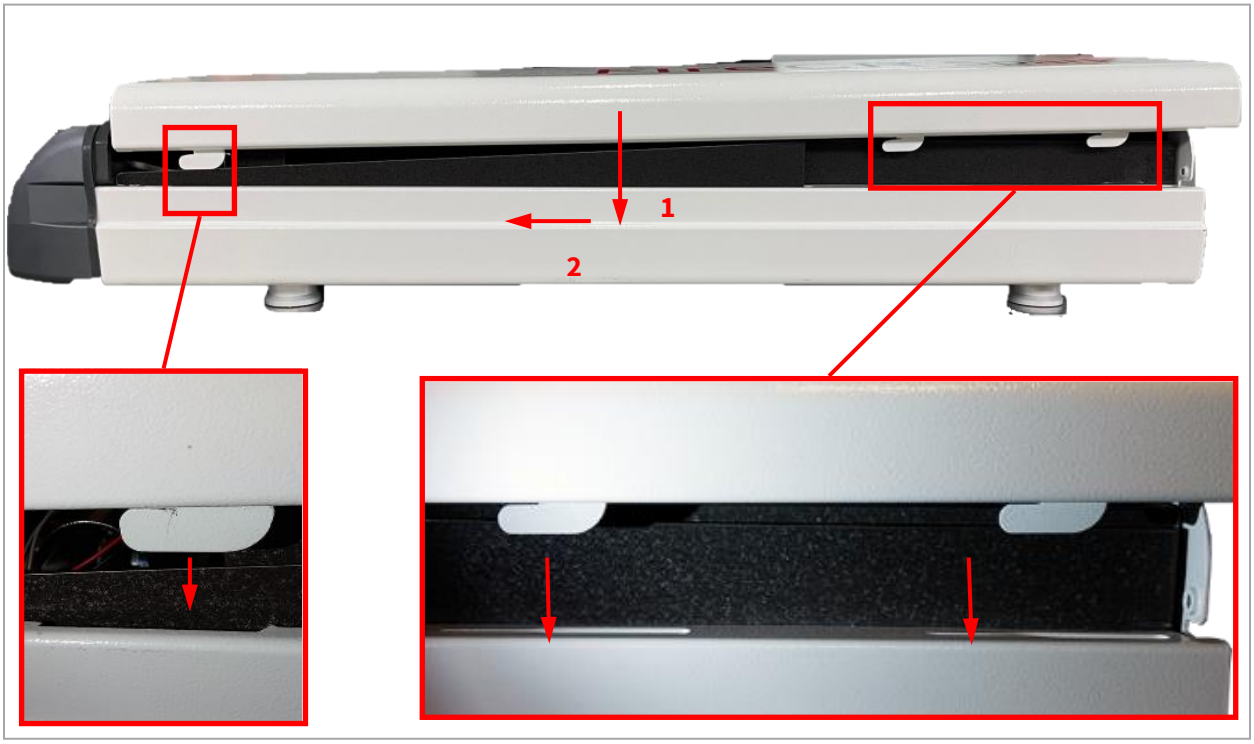
1. Switch the reader off on the back and unplug both cables.
   It is recommended to be careful when disassembling the cover and removing screws and cables to avoid confusion.



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

3. Move the top cover towards the back and lift it off. The cover has a tight fit, and a bit of force has to be applied to move it.

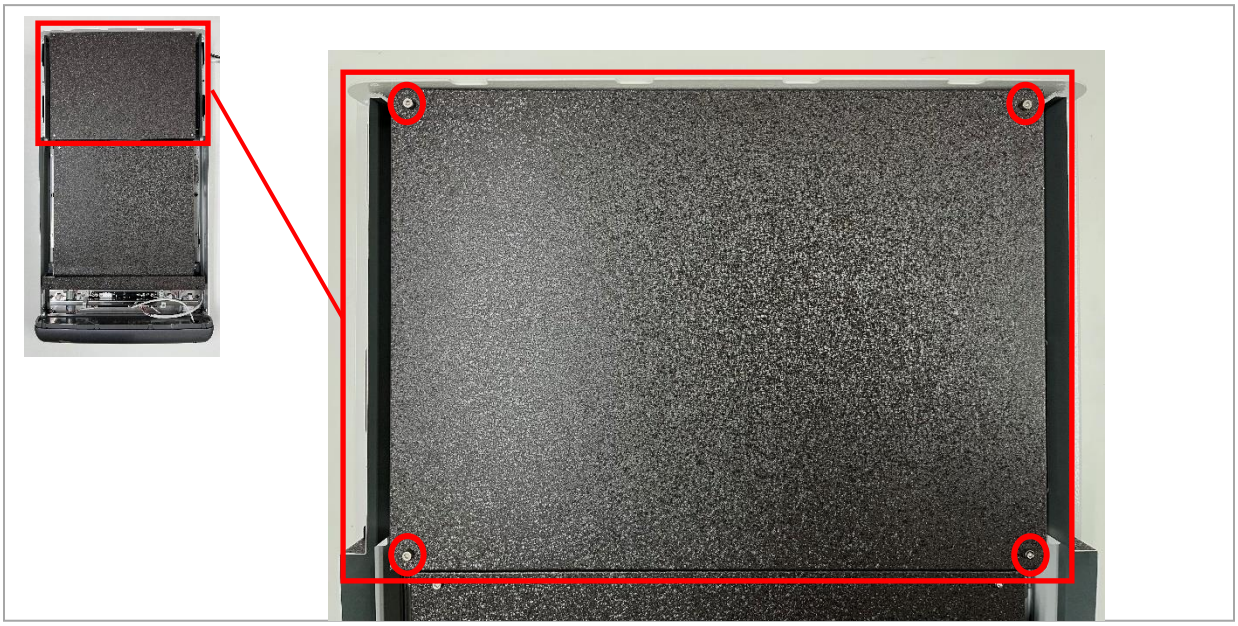
4. When mounting the new top cover, or remounting the old top cover, ensure that locks on the top cover is seated in the guides in the bottom cover, then move it towards the front to lock it in place.



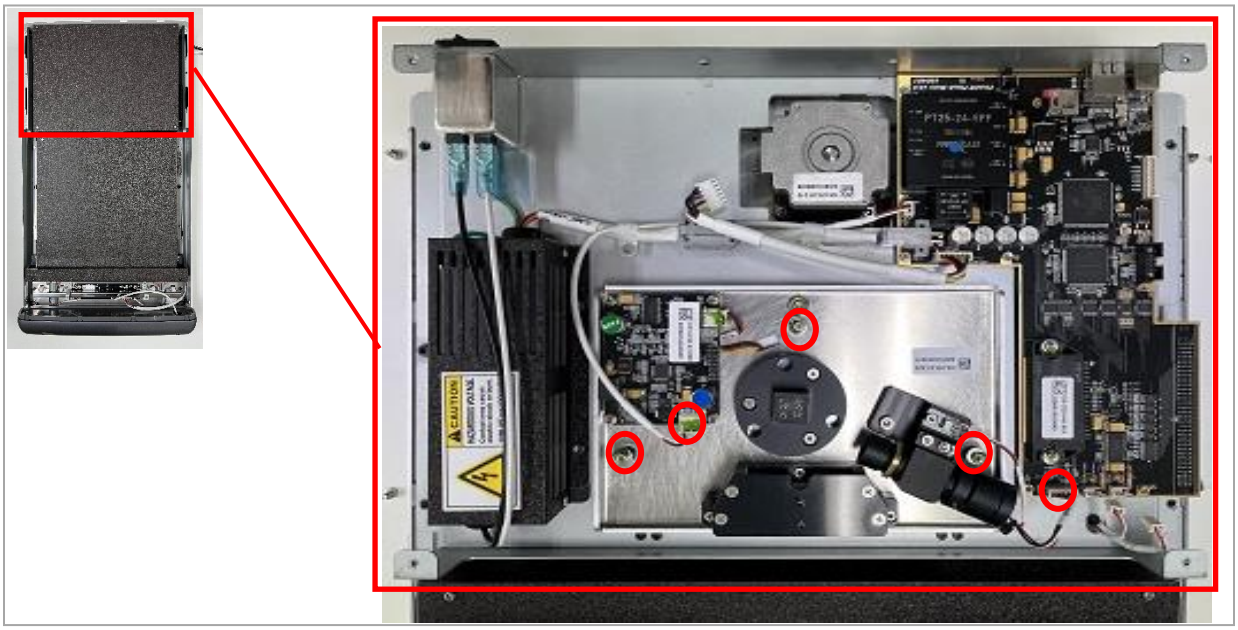
5. Insert and fasten the 4 screws in the back of the scanner using a 3 mm hex key.

Replacing the Laser Optics Assembly.

1. Follow step 1 through 3 of Replacing the top cover.
2. Remove the 4 screws on the back using a 2.5 mm hex key.

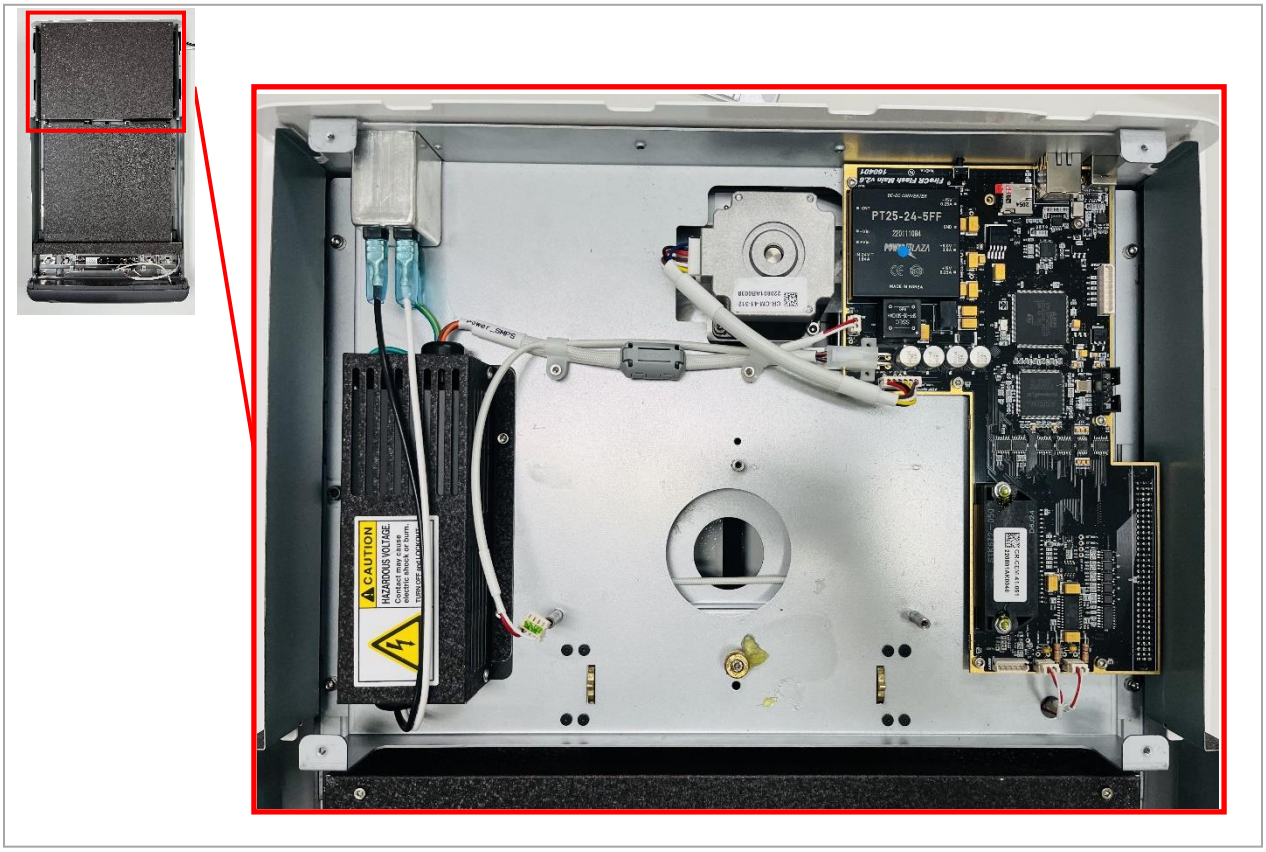


3. Remove the cover of the Laser Optic Assembly.
4. Unplug the connector shown from the Laser Optic Assembly. After removing the multi-cable , need to use a 2.5mm hex key to remove the screw .



5. Be careful of the spring and washer when removing the 2.5mm screw.

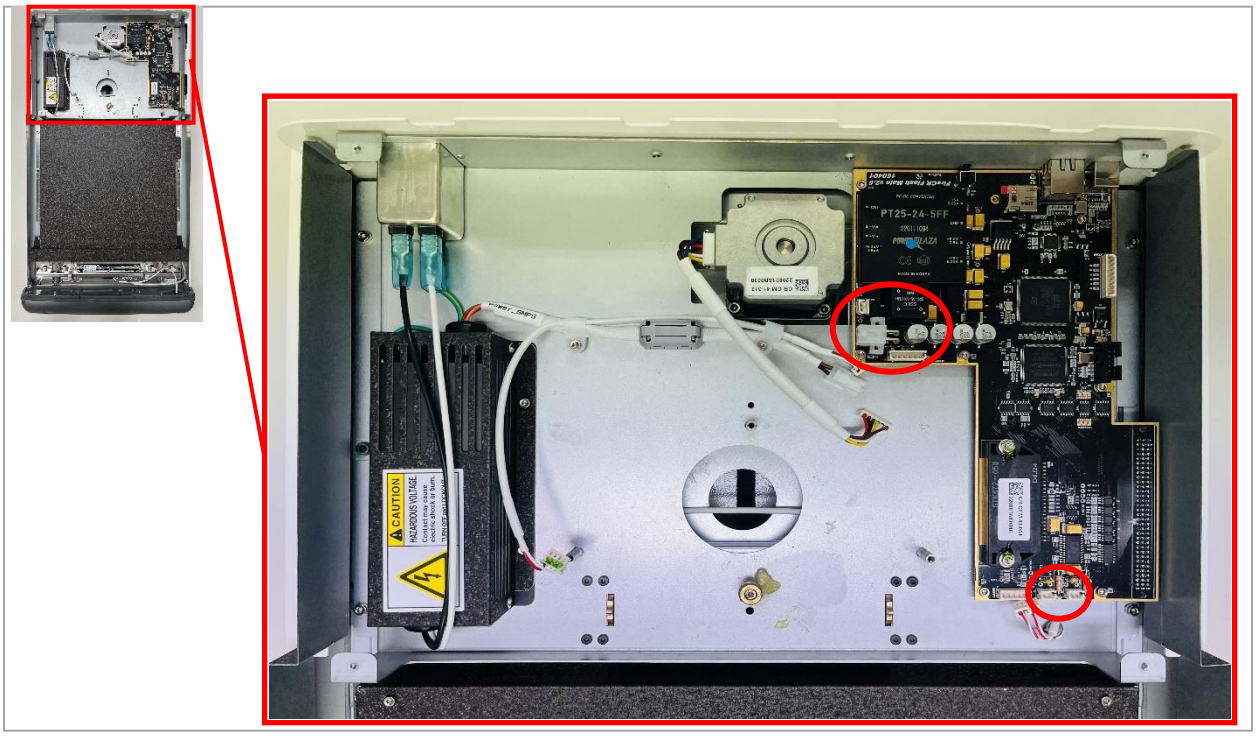
6. Do not touch the square mirror and laser of Laser Optic Assembly as they are finely adjusted.



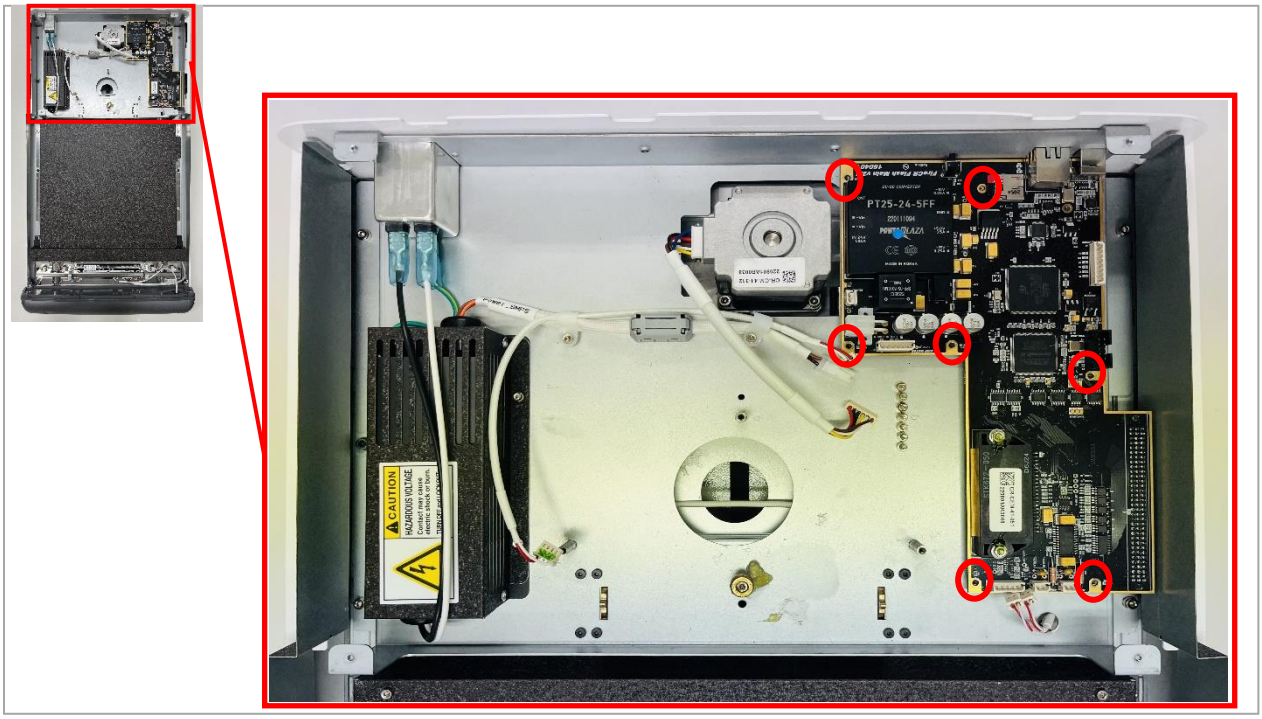
7. Install in reverse order and calibrate the unit as described under calibration.

Replacing the Main Board.

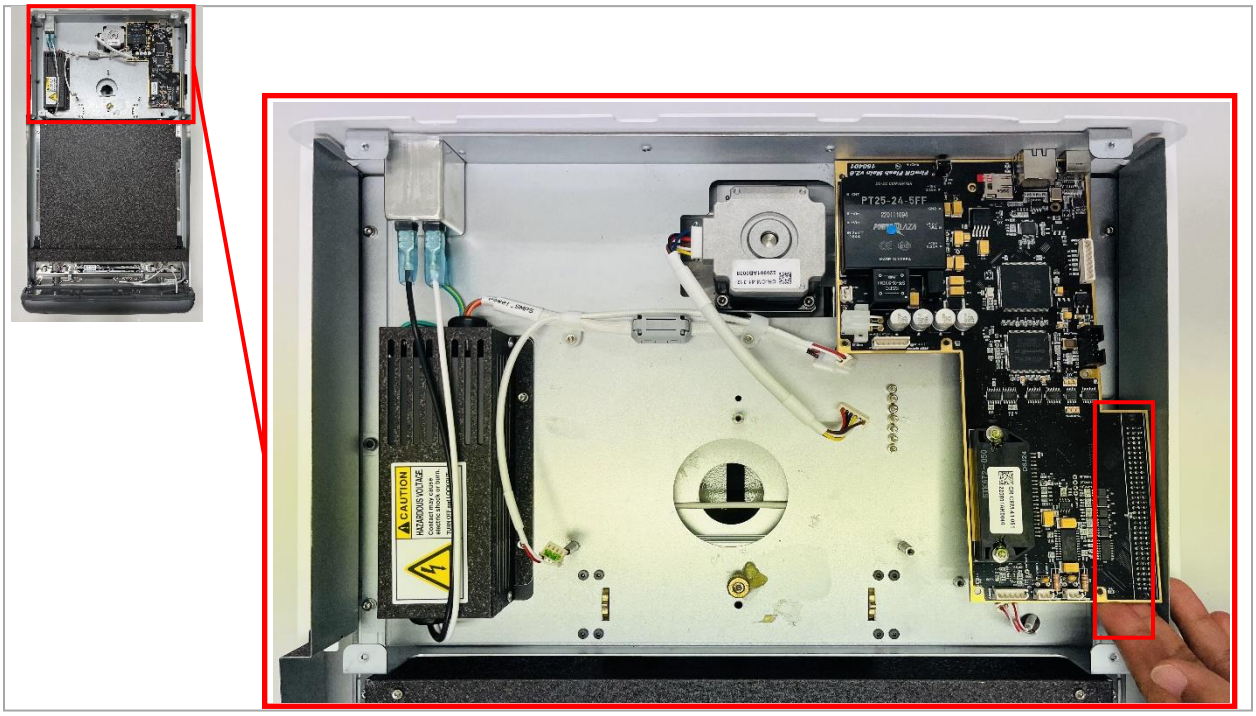
1. Disassemble the 5 cables.



2. Remove the 7 screws using a 2.5 mm hex key.



3. Carefully disassemble the Main board connected to the Interconnect board.

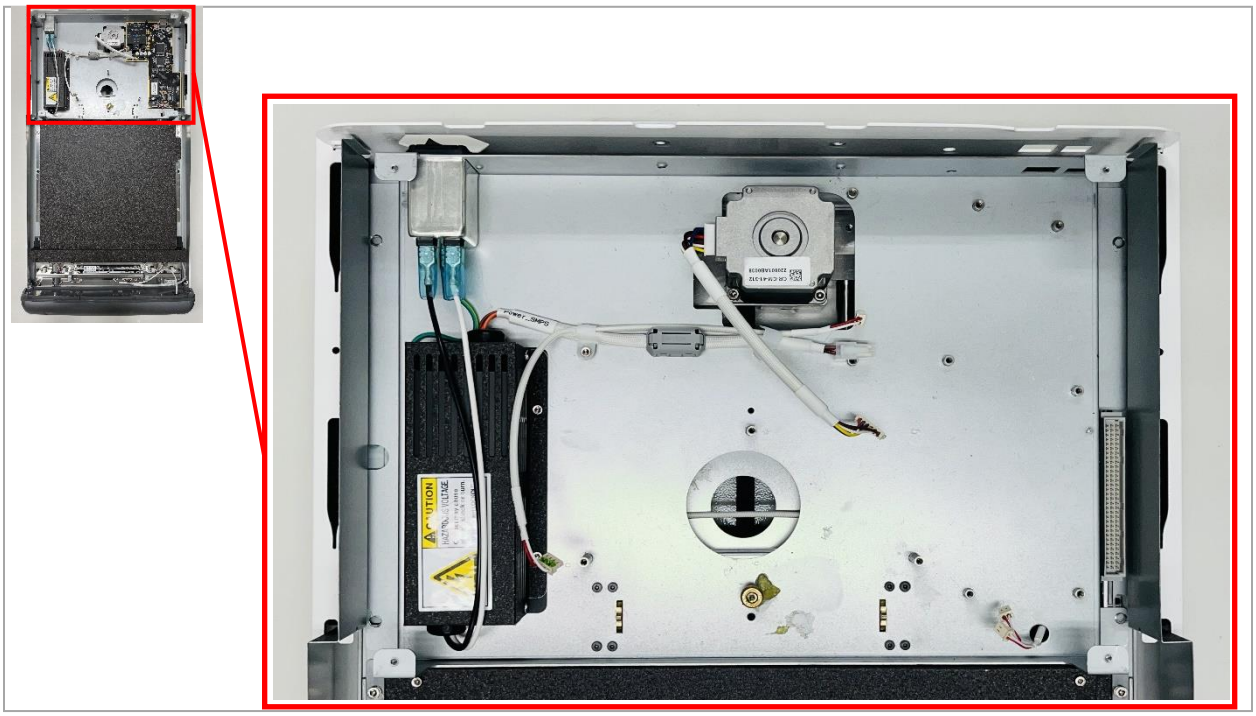


4. Assemble in reverse order and connect the cables. Then assemble the cover.

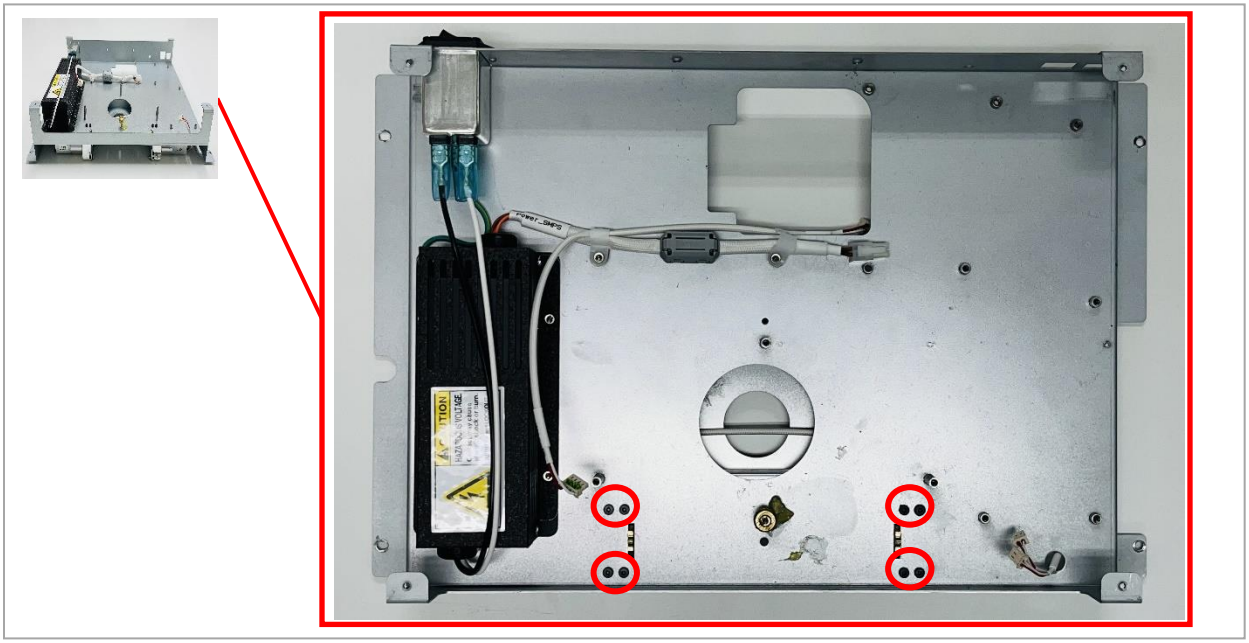
Replacing the Algin Motor.

1. Remove the 4 screws on the Electronic Module Base Plate using a 3 mm hex key.

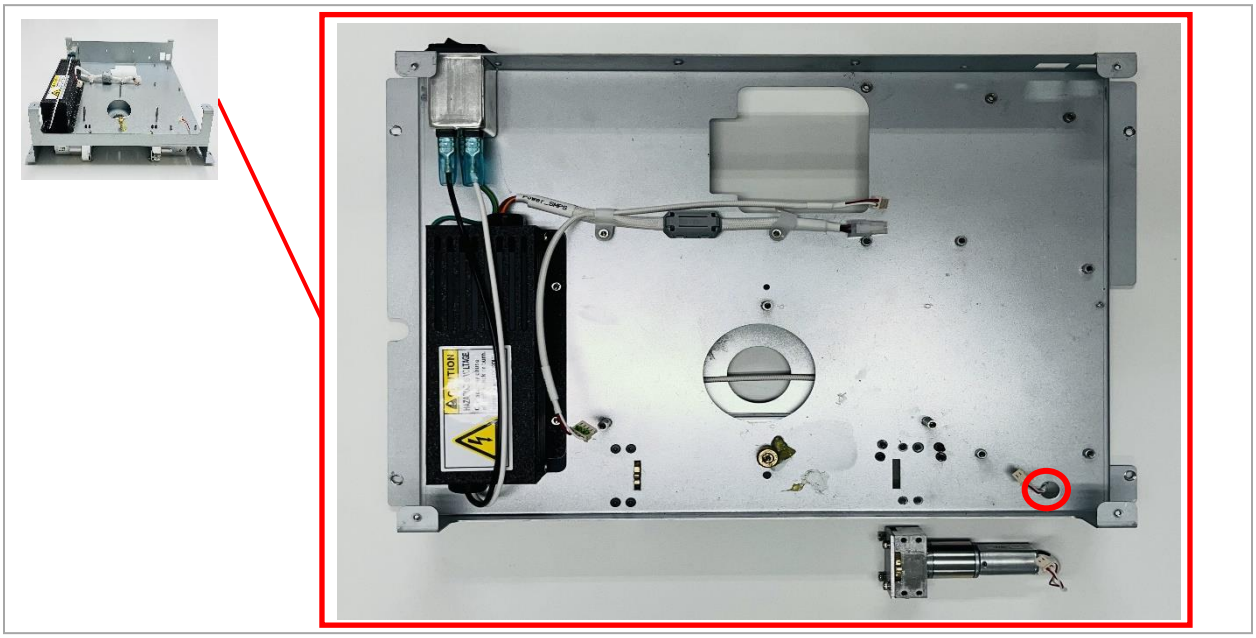
2. Disassemble the Electronic Module Base Plate gently, paying attention to the power switch.



3. Remove the 8 screws using a 2 mm hex key.



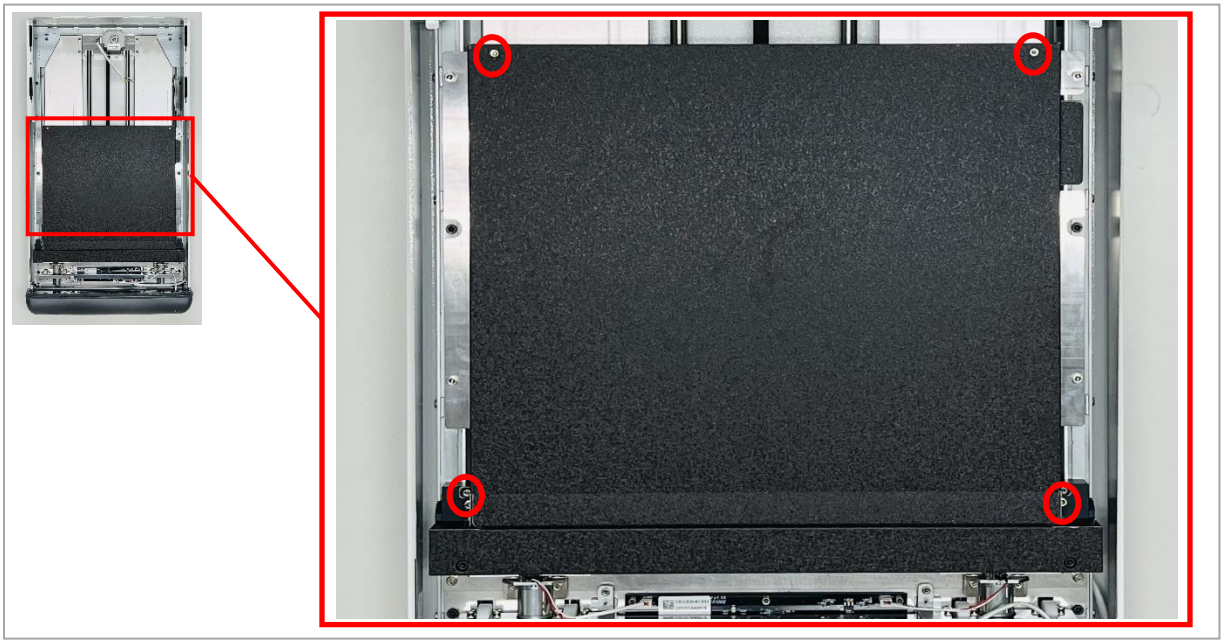
4. Disassemble along with Align motor cable.



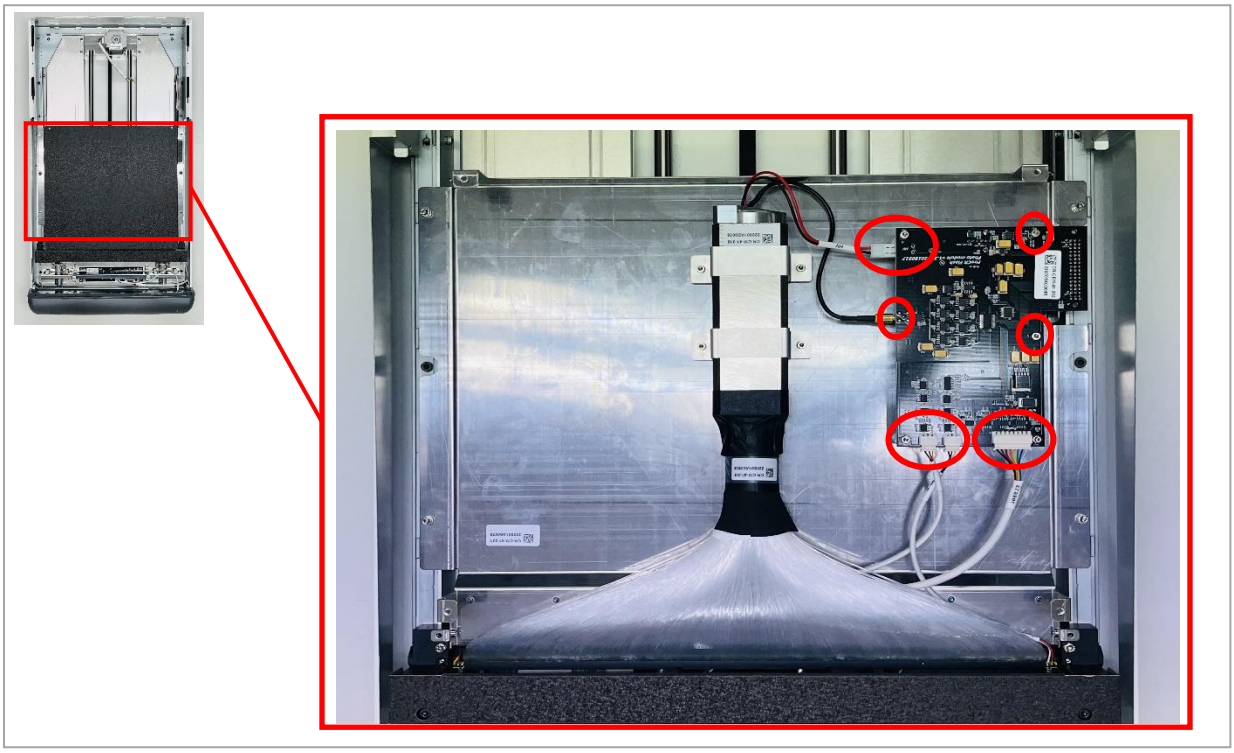
5. Remove another lock motor in the same way.
6. Assemble in reverse order and connect the cables. Then assemble the cover.

Replacing the Photo Module Board.

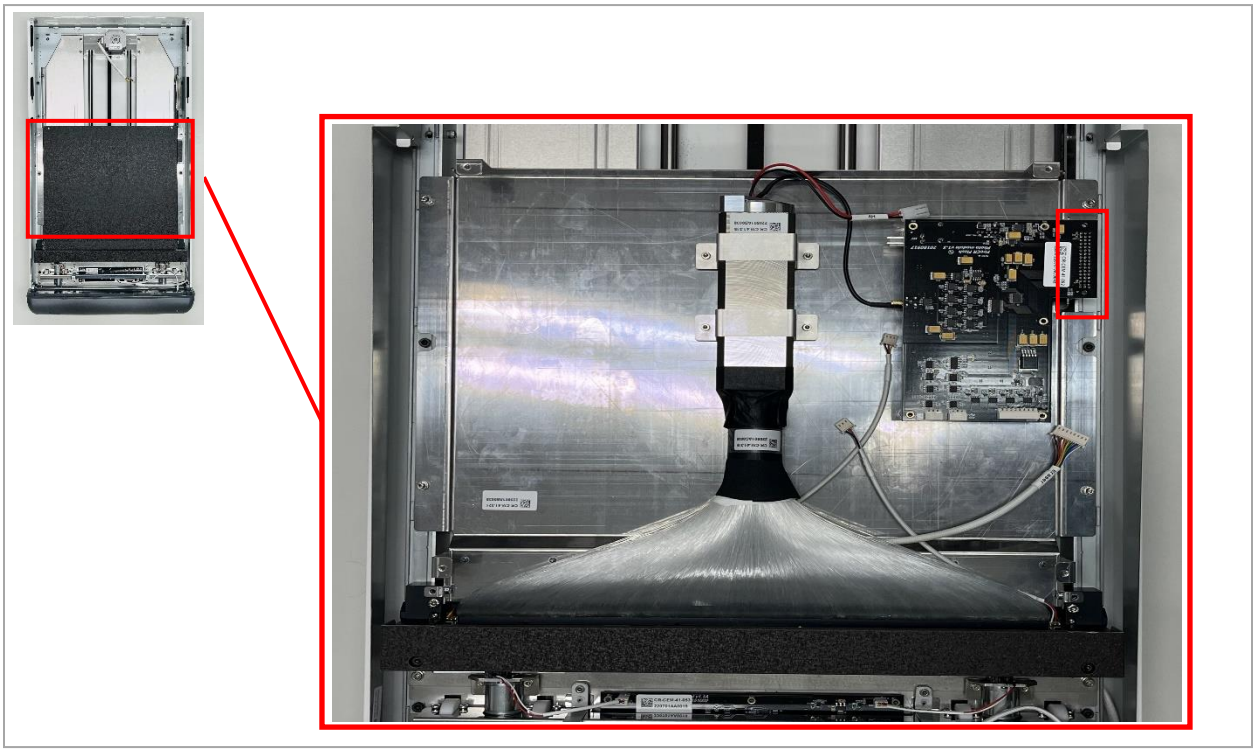
1. Remove the 4 screws using a 2.5 mm hex key.



2. Remove the 5 cables and the 4 screws using a 2.5 mm hex key.



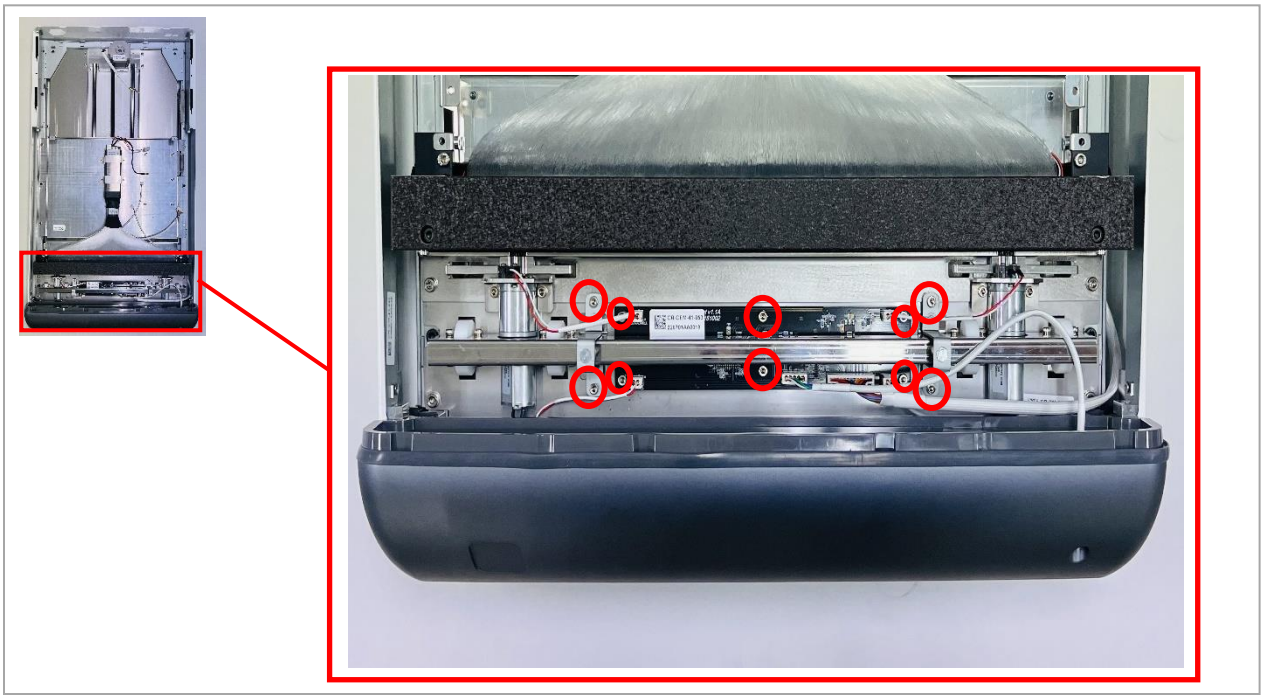
3. Carefully disassemble the Photo Module board connected to the Interconnect board.



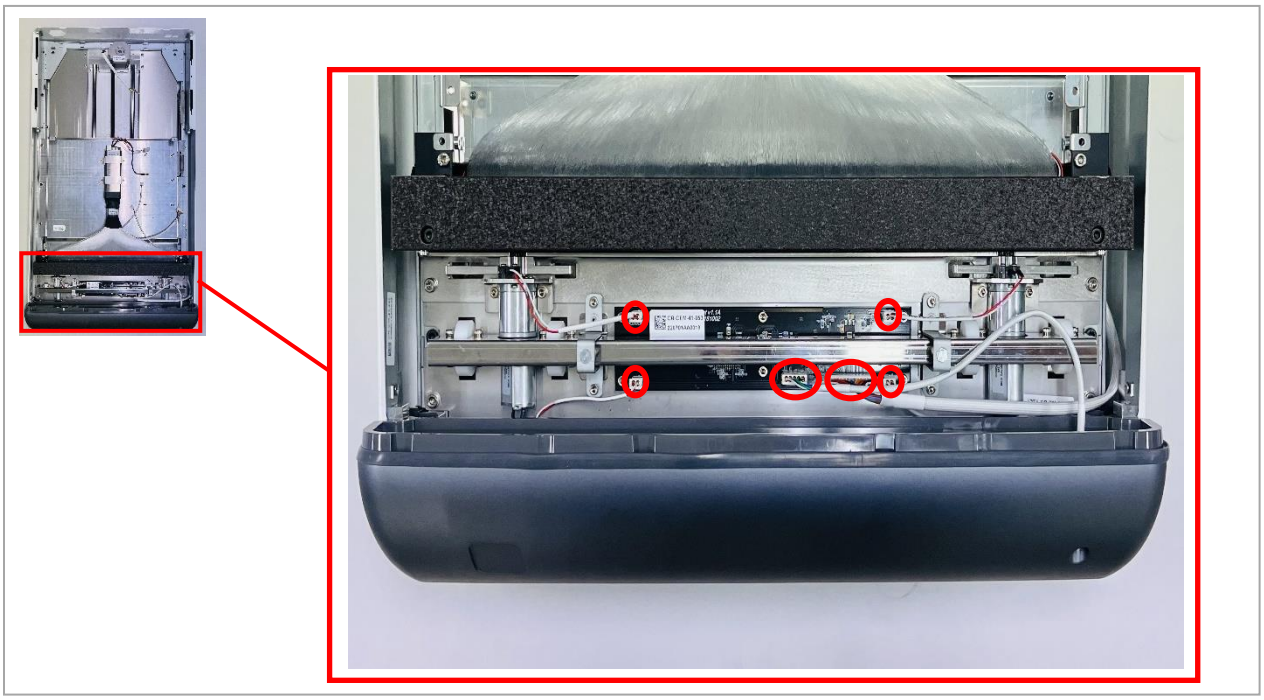
4. Assemble in reverse order and connect the cables. Then assemble the cover.

Replacing the cassette lock motors and Front Board.

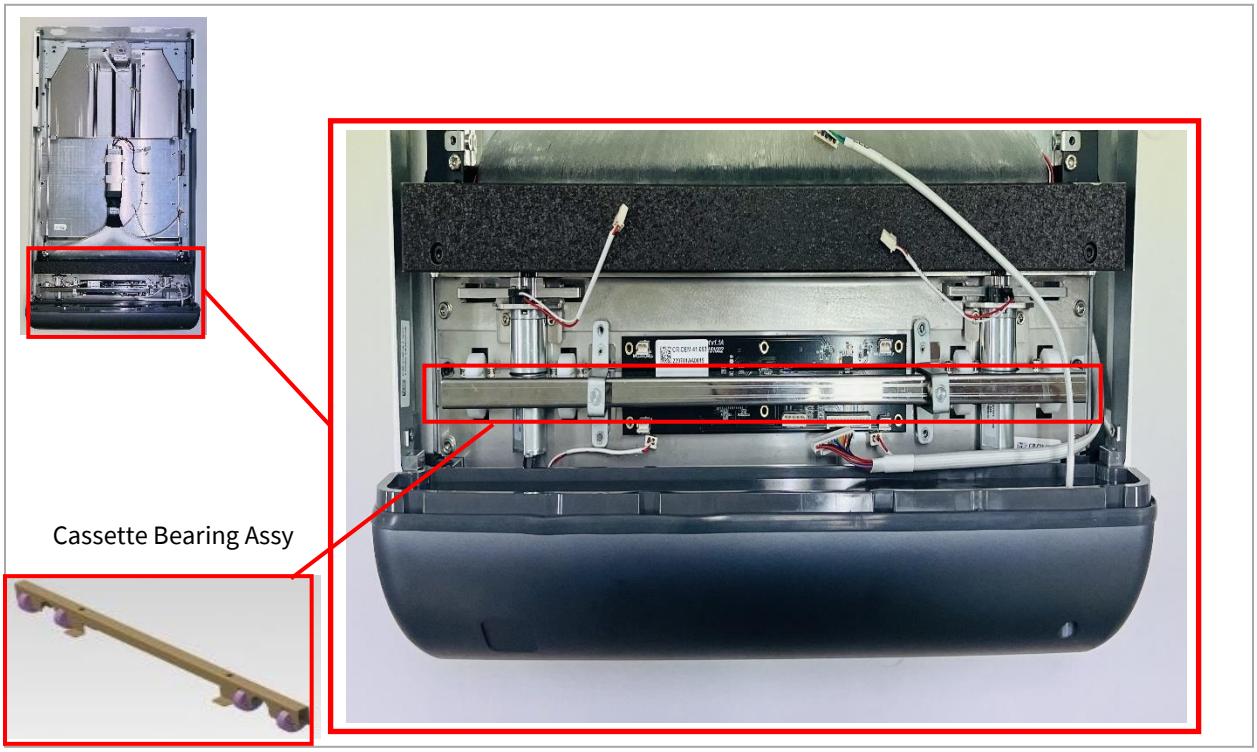
1. Remove 10 screws using a 2.5 mm hex key.



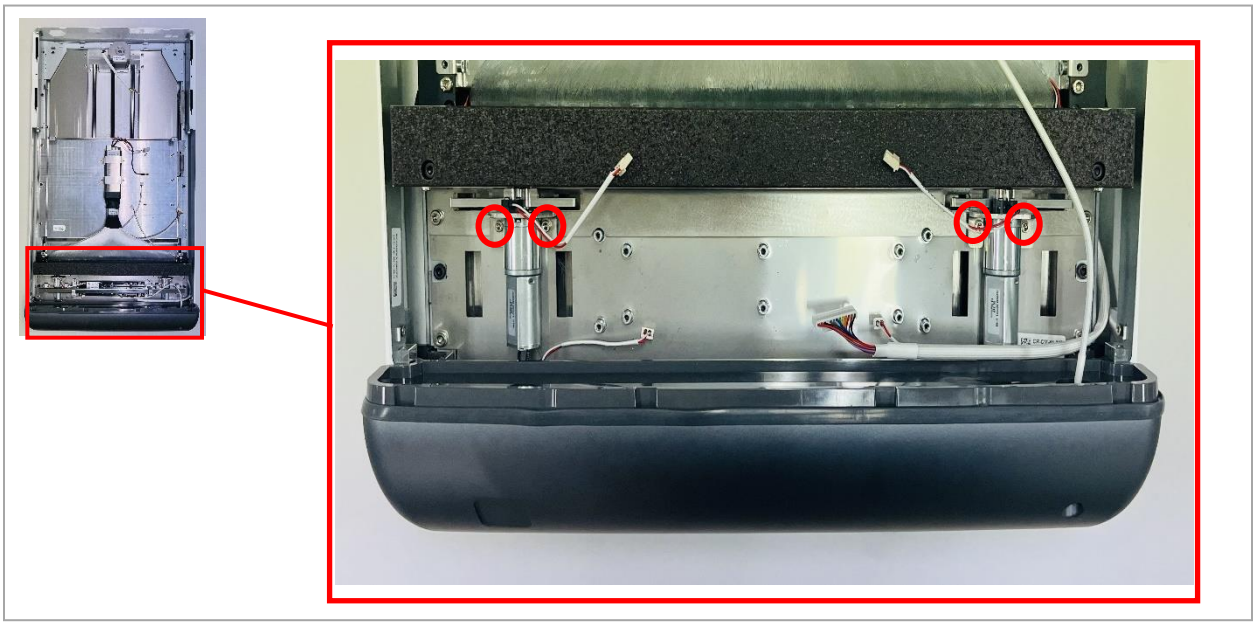
2. Remove 6 cables connected to the Front board.



3. Disassemble Cassette Bearing Assy and Front board.



4. Remove 4 screws connected to Lock Motor.

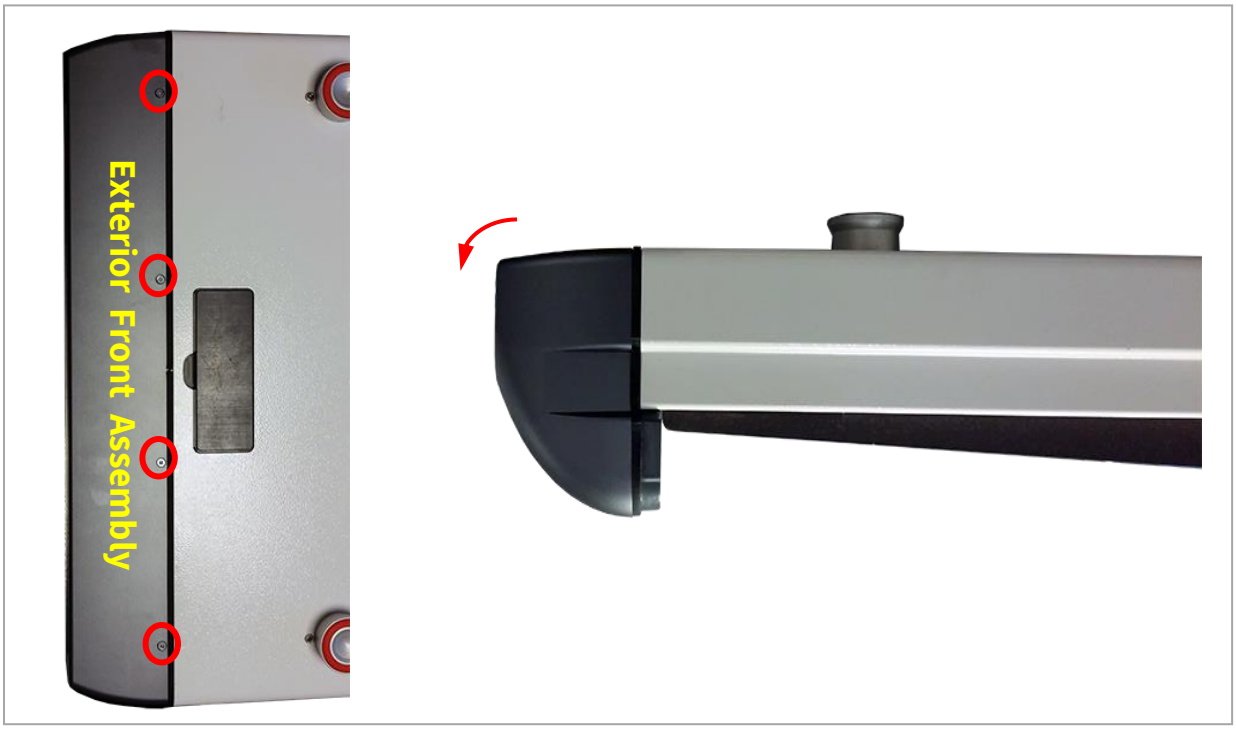


5. Assemble in reverse order and connect the cables. Then assemble the cover.

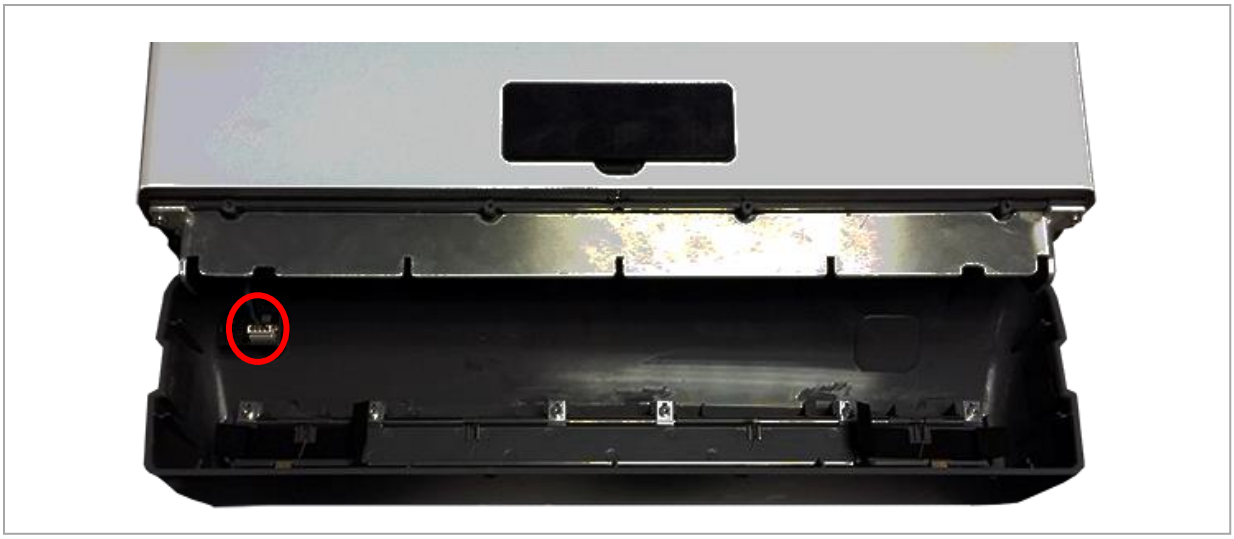
Replacing the Housing Assembly.

Subtitle: How to remove the bottom cover

1. Follow step 1 through 3 of Replacing the top cover.
2. Turn the scanner over to gain access to the bottom and remove the 4 screws holding the Extrerior Front Assembly using a PH1 screwdriver.
3. Carefully tilt the Extrerior Front Assembly, do **NOT** pull it off as this could damage or breaking the wires for the LED indicator.



4. Unplug the connector for the LED and remove the Exterior Front Assembly.

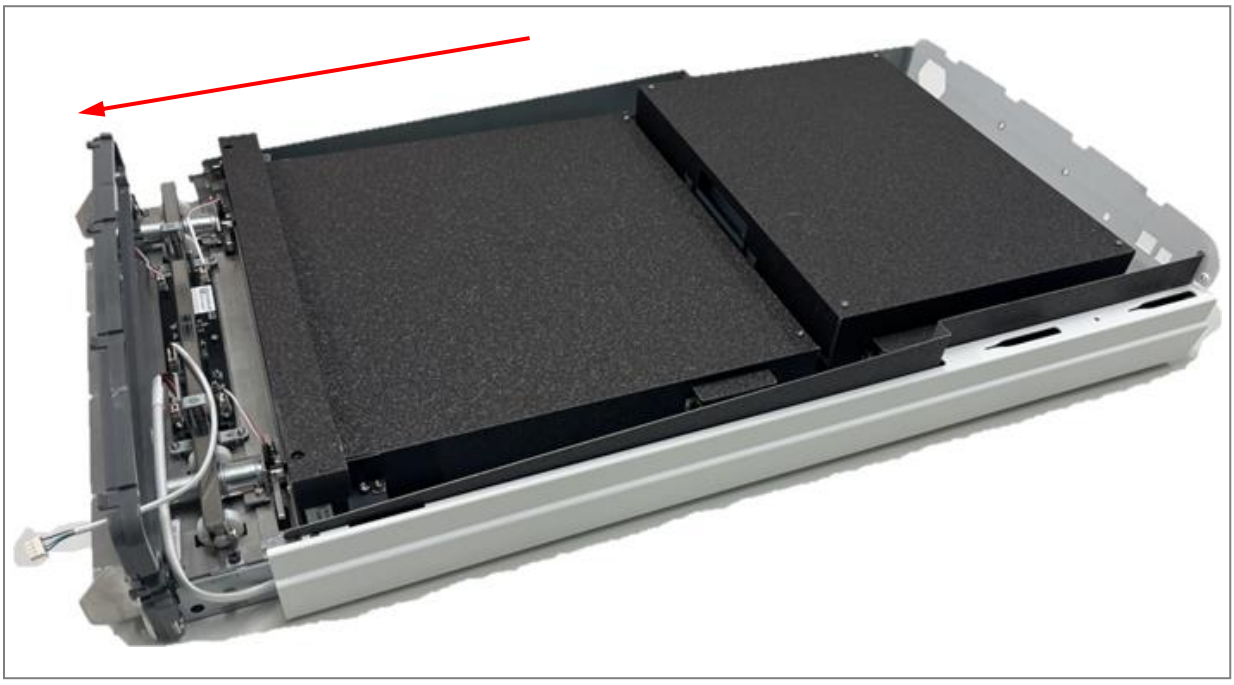


5. Remove the 2 screws using a 4 mm hex key.

6. Turn the scanner over to gain access to the bottom and remove the 4 feet by rotating them counterclockwise.

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

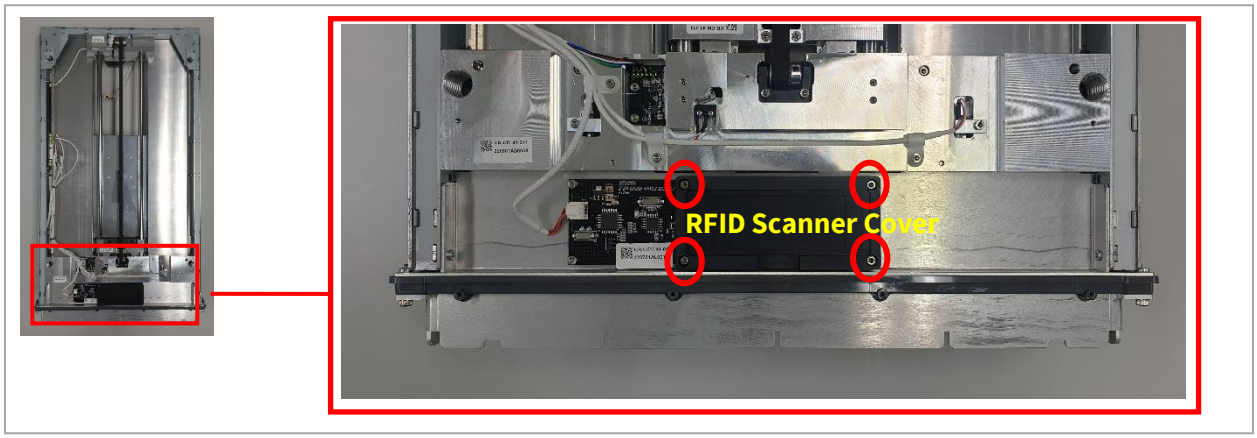
8. Carefully remove the Housing assembly out of the bottom cover.



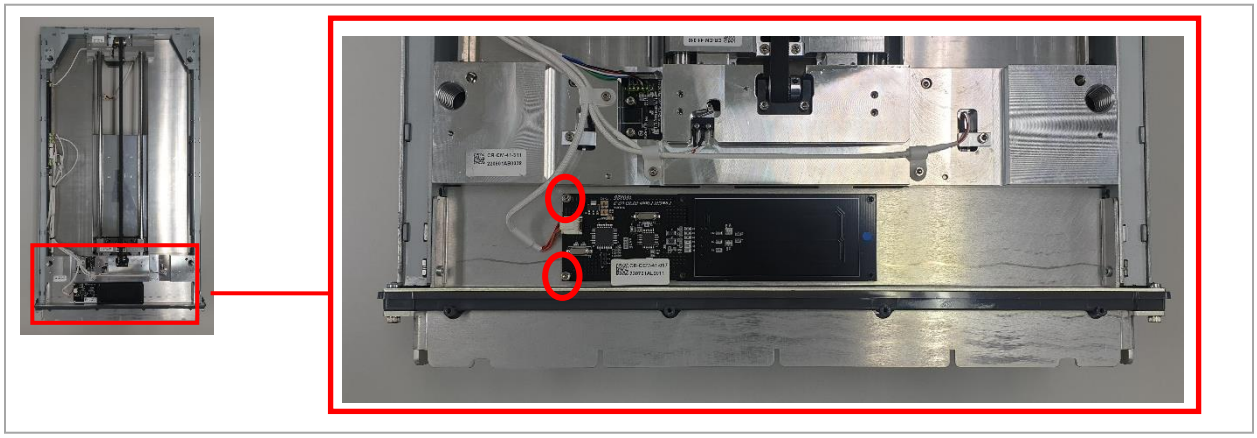
9. Install in reverse order.

Replacing the RFID Board.

1. Follow step 1 through 3 of Replacing the top cover.
2. Follow step 1 through 8 of How to remove the bottom cover.
3. Remove the 4 screws using a 2.5 mm hex key. And disassemble RFID Scanner Cover.



4. Remove the 2 screws using a 2.5 mm hex key. And disassemble RFID board.



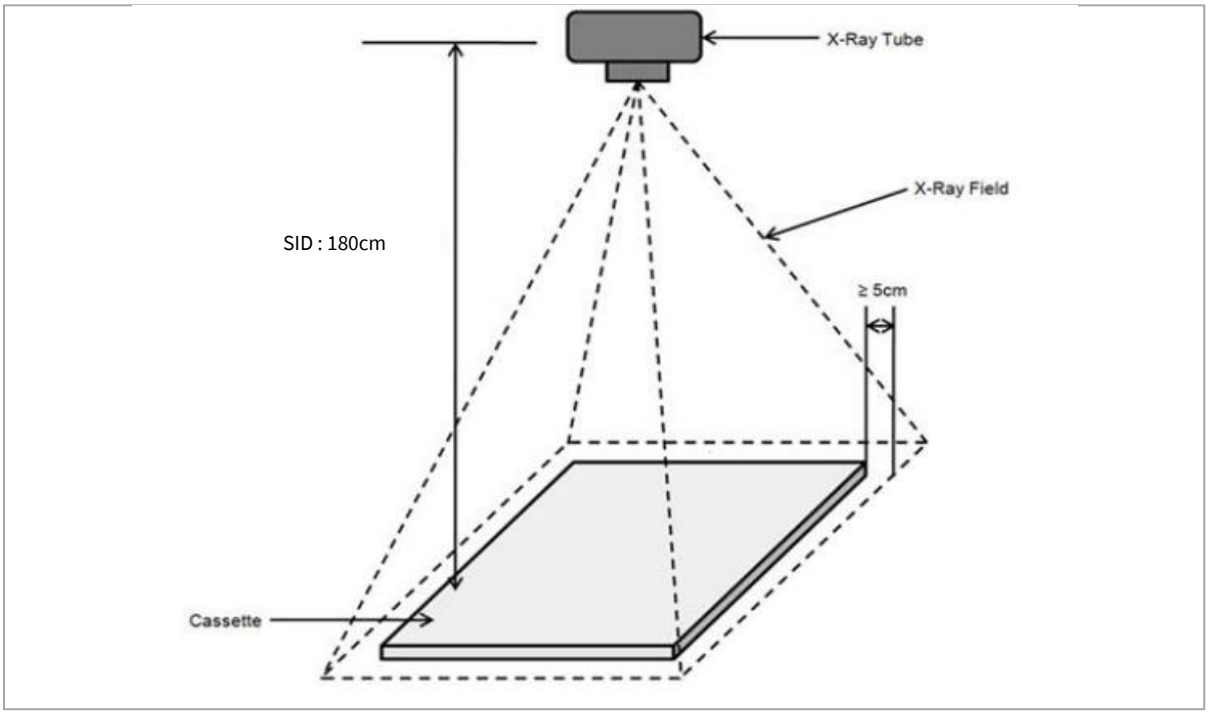
5. Assemble in reverse order and connect the cables. Then assemble the cover.

Calibration

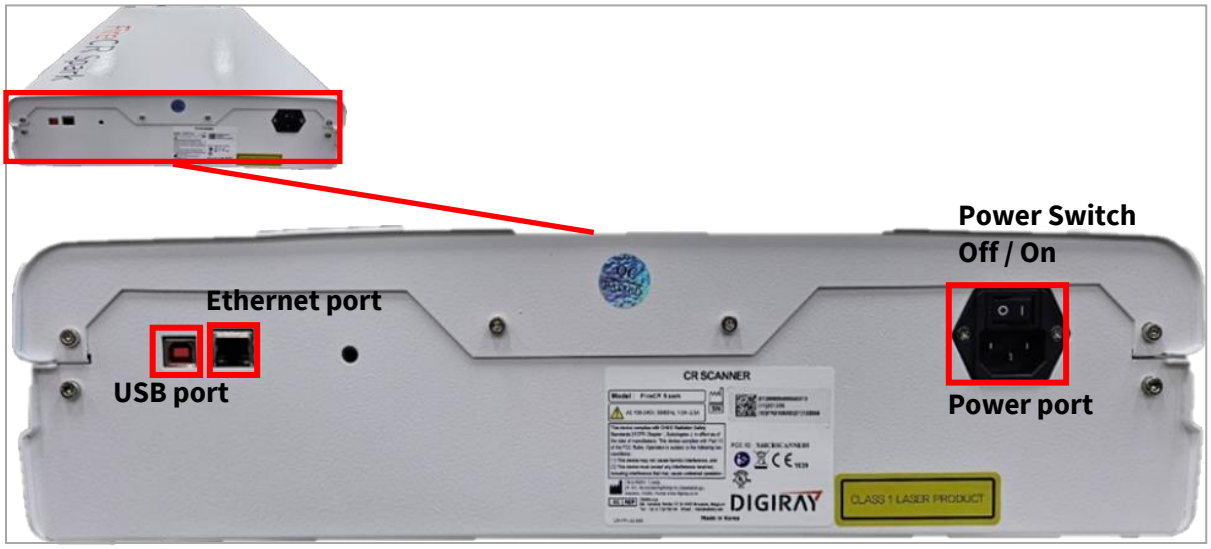
Each Spark scanner has two calibration(Table top, Wall mount) sets installed, and these should be updated if either the Laser Optic Assembly is replaced.

We recommend Calibration when moving and installing the Spark scanner.

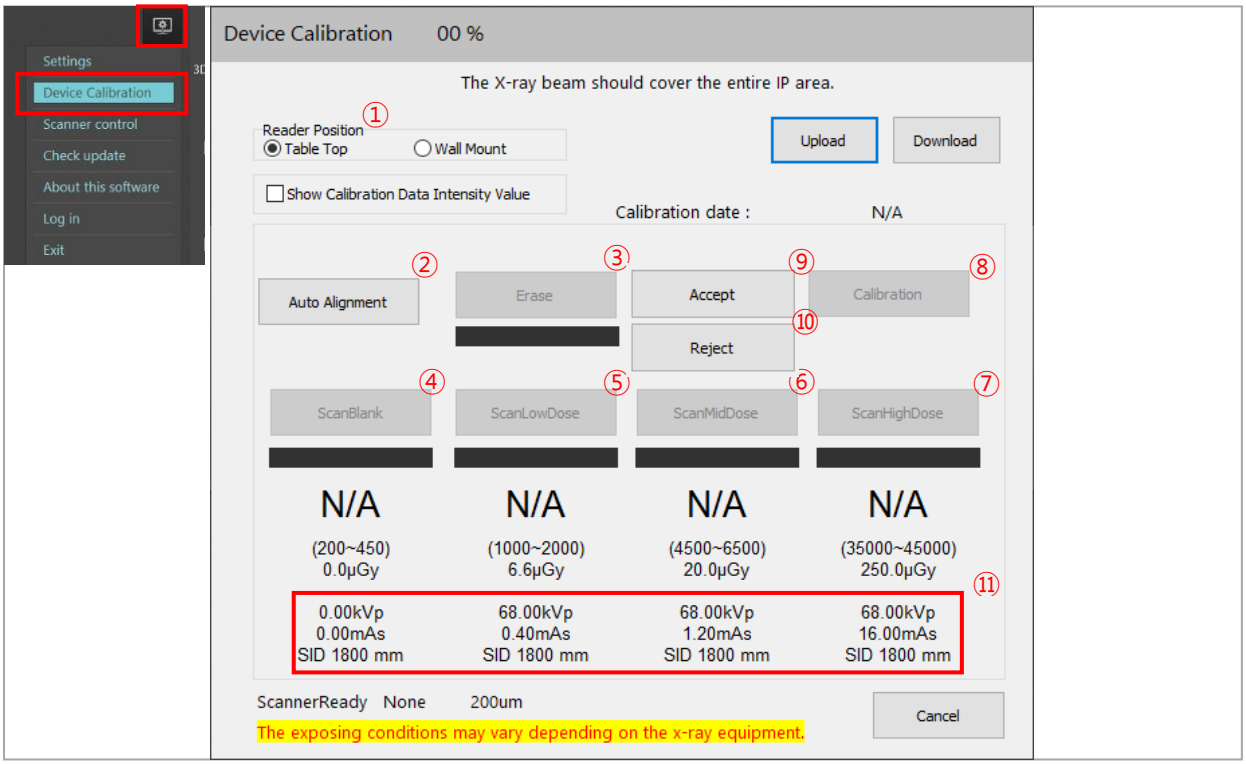
1. During the Calibration X-ray radiation field must cover the whole area of the cassette. SID may vary depending on site conditions.



2. Connect the Spark scanner to the PC via a USB cable or Ethernet cable, and connect the power cord to the power inlet. Then power on.



3. Open Quantor software and select the system menu in the upper-right corner of the screen. Select “Device Calibration”.



No.	Name	Description
1	Reader Position	Select the state where Spark reader is installed
2	Auto Alignment	Automatically align the laser to the optimal position
3	Erase	Erase the remaining X-rays from the cassette
4	ScanBlank	Create the first calibration image file
5	ScanLowDose	Create the second calibration image file
6	ScanMidDose	Create the third calibration image file
7	ScanHighDose	Create the fourth calibration image file
8	Calibration	Create a calibration data file
9	Accept	Options when the recommended X-ray dose is not shown
10	Reject	Options when the recommended X-ray dose is not shown It is recommended to click “Reject” and try again after adjusting the X-ray dose.
11	Generator settings	Refer to X-ray dose value

WARNING

The generator settings under each calibration step is merely a guide, the settings may vary for each generator when calibrating, the important part is to get scans that results in green numbers.

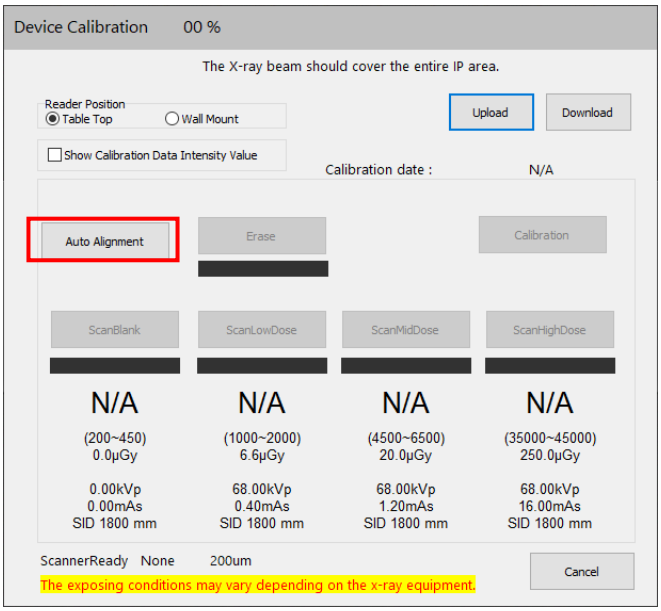
Requires X-ray exposure without objects in a 35 cm x 43 cm cassette.

4. Follow the steps below.

Step 1 : Prepare an X-ray device and Cassette 35cm x 43cm.

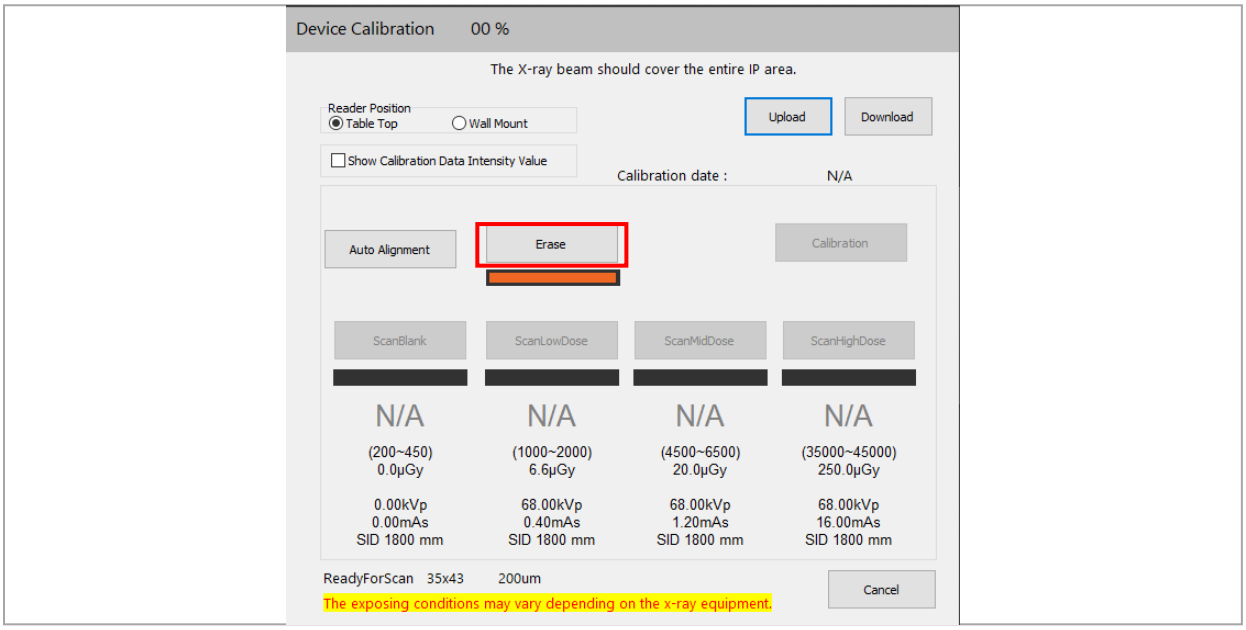
Step 2 : After selecting the Reader Position, insert the Cassette into the Spark reader.

Step 3 : Click the “AutoAlignment”.

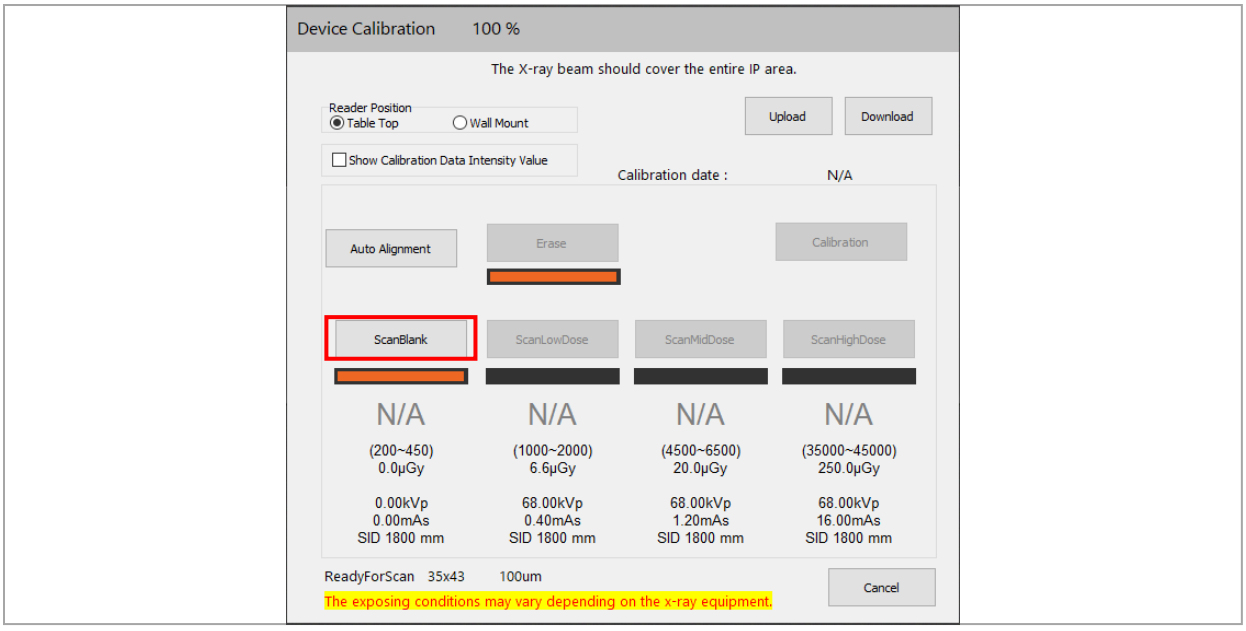


Step 4 : When AutoAlignment is completed, the “Erase” button is activated. Click the “Erase”

When Erase is complete, take out the Cassette.

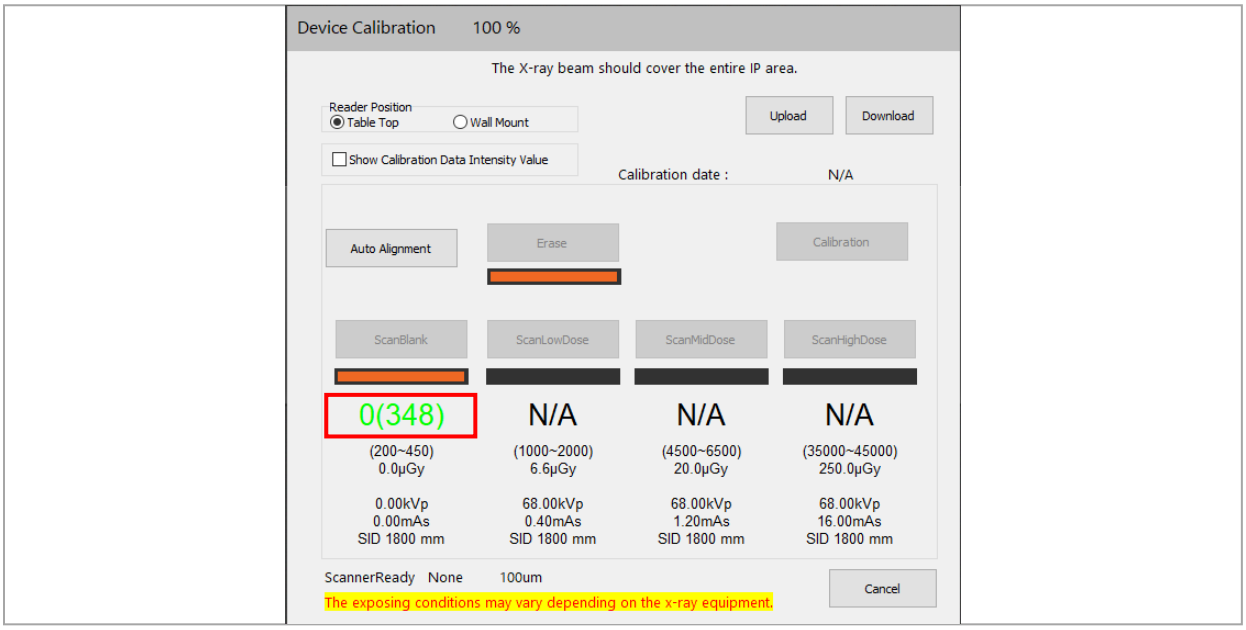


Step 5 : Insert the Cassette. When the “ScanBlank” button is active, click the “ScanBlank”.



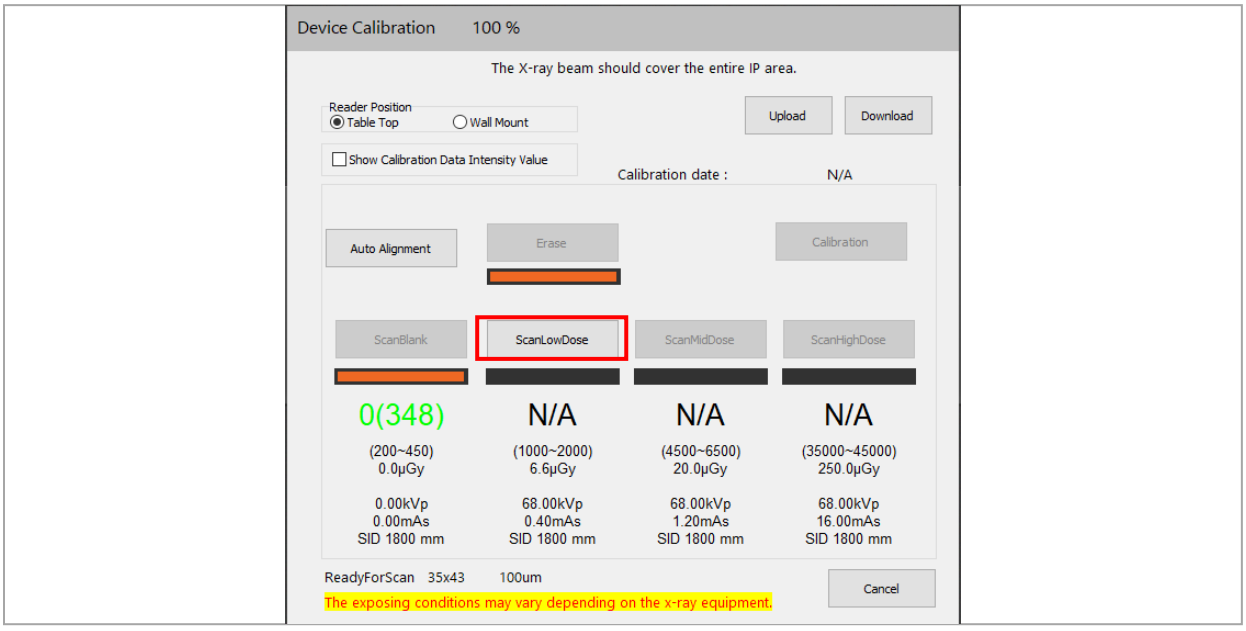
Step 6 : When ScanBlank is completed, a green mark is generated, and take out the Cassette.

If a red mark is generated, contact the DIGIRAY service team.



Step 7 : Expose X-ray to Cassette, and insert the Cassette on Spark reader.

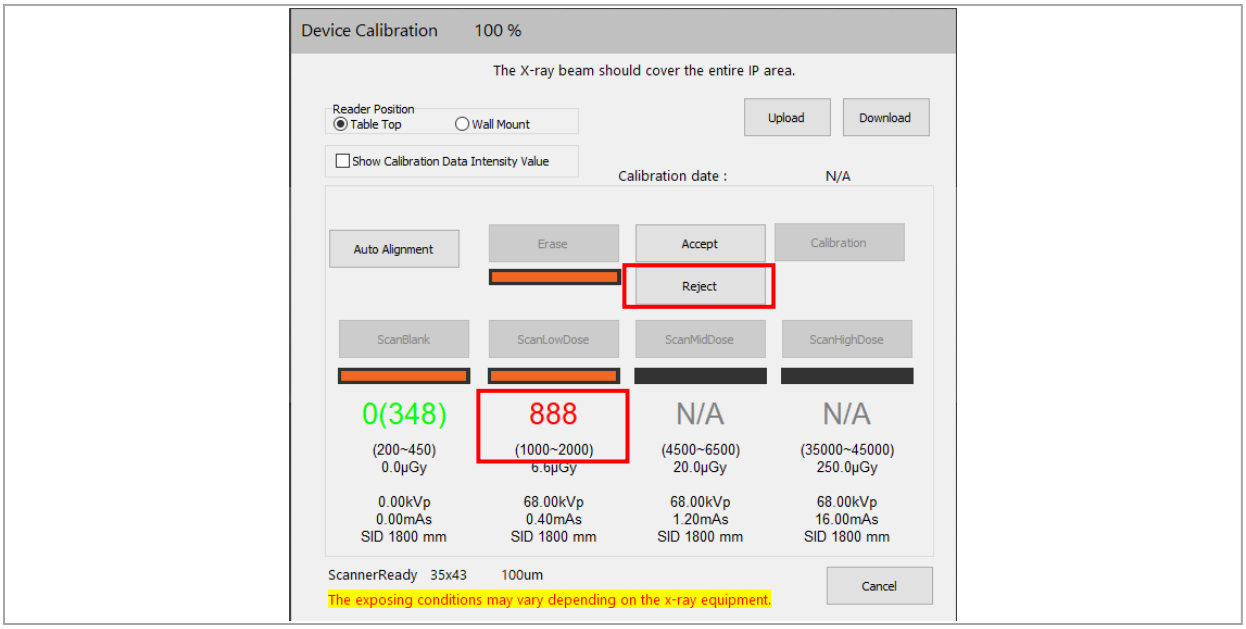
When the “ScanLowDose” button is active, click “ScanLowDose”.



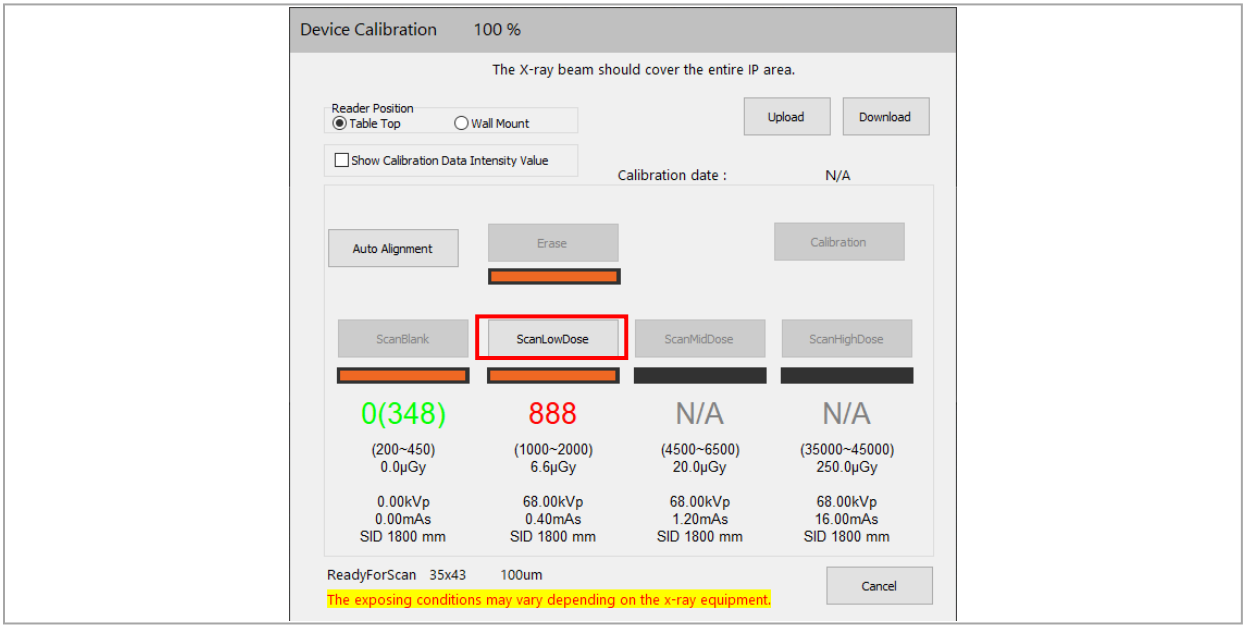
Step 8 : Take out the cassette when “ScanLowDose” is complete.

If a red mark is generated, click the “Reject” button. Adjust the X-ray dose and expose to the cassette.

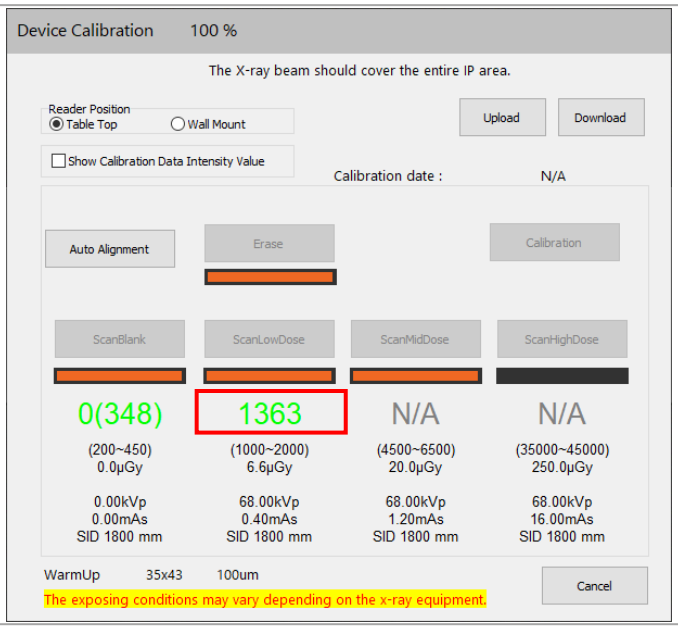
* If the red mark is lower than the recommended range, as in the example photo, adjust the X-ray dose higher.



Step 9 : Insert the cassette into the Spark. When "ScanLowDose" is activated, click ScanLowDose".

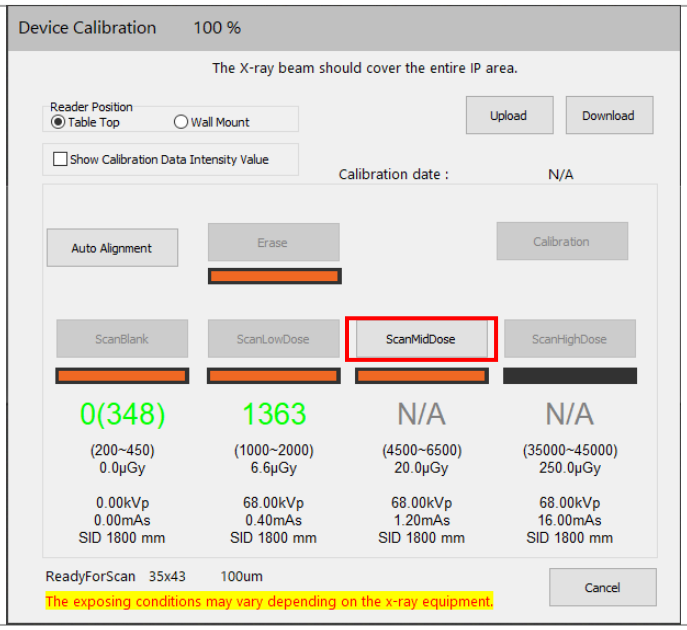


Step 10 : Take out the cassette when "ScanLowDose" is complete.



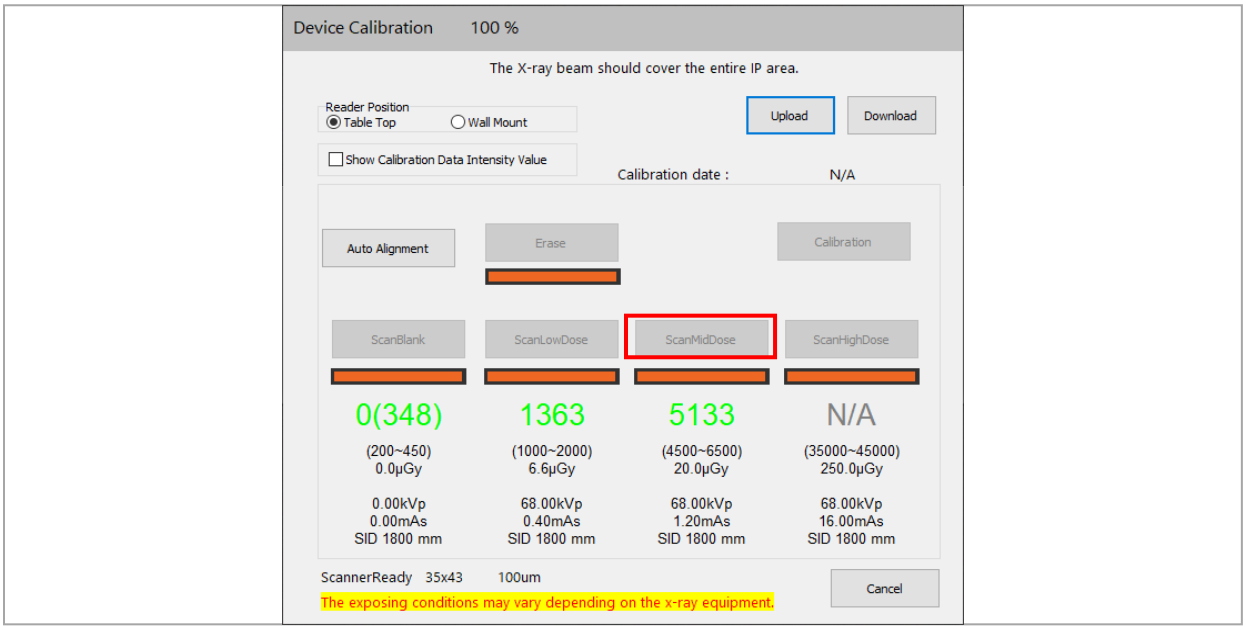
Step 11 : Expose X-ray to Cassette, and insert the Cassette on Spark reader.

When the “ScanMidDose” button is active, click “ScanMidDose”.

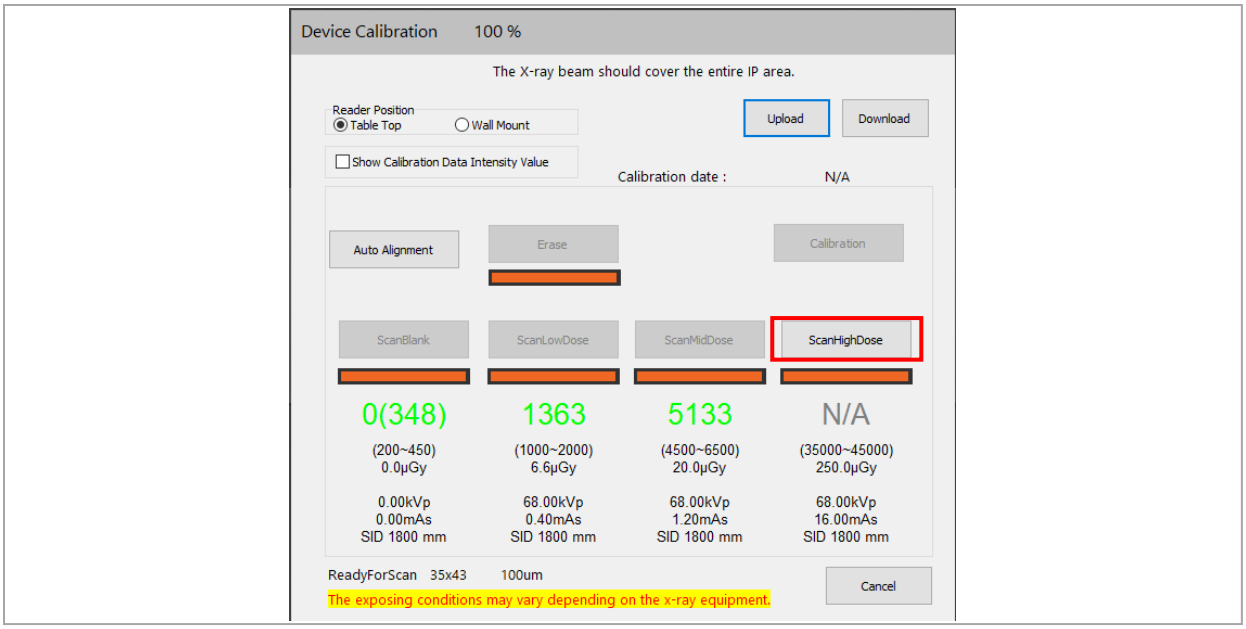


Step 12 : Take out the cassette when "ScanMidDose" is complete.

If a green mark is generated, expose the cassette to X-rays, and insert the Cassette.

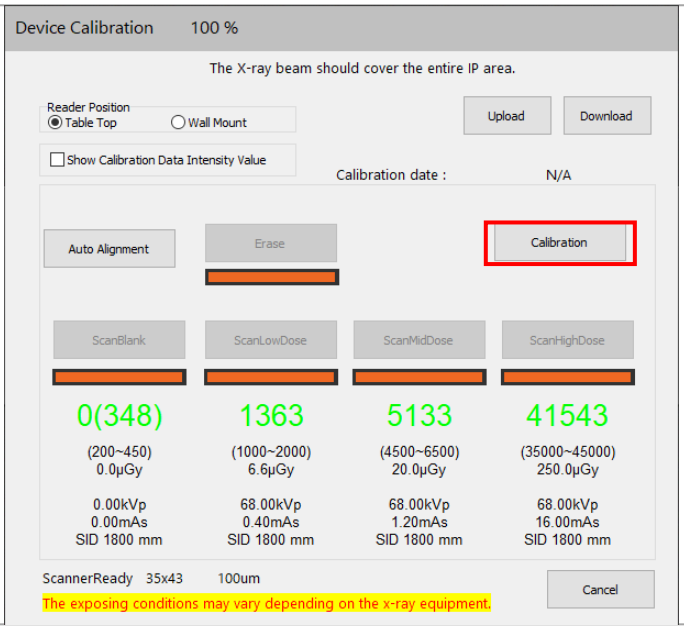


Step 13 : When “ScanHighDose” is activated, click “ScanHighDose”.

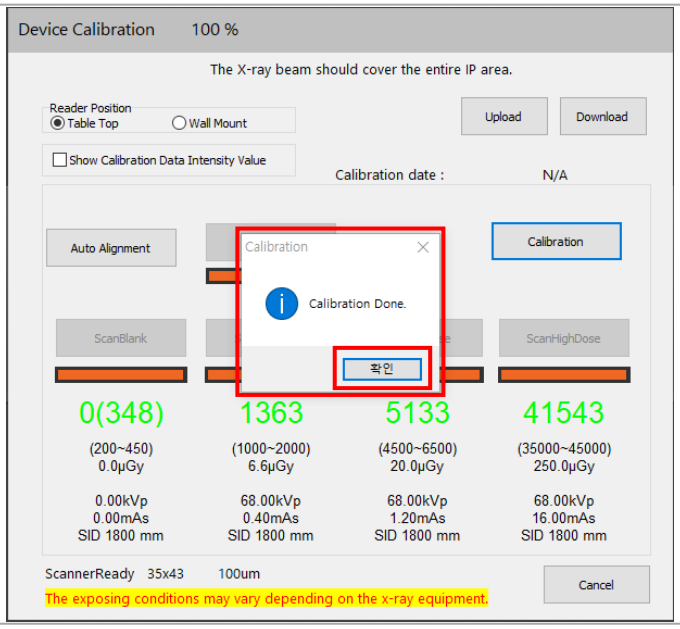


Step 14 : Take out the cassette when "ScanHighDose" is complete.

If a green mark is generated, click the “Calibration”.



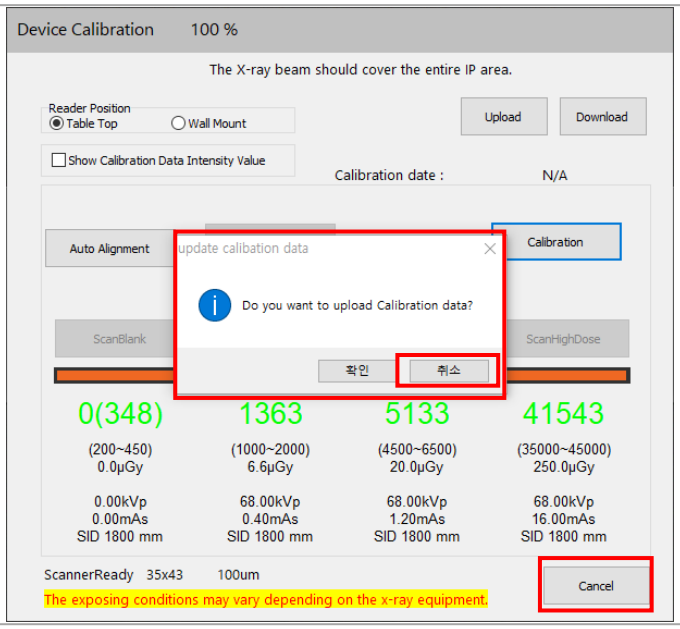
Step 15 : When calibration is complete, click “확인” (it is means OK) on the pop-up window.

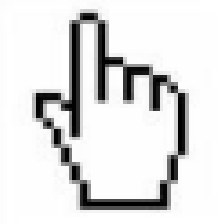


Step 16 : If a pop-up window to upload calibration data appears, click “취소” (it’s means cancel).

And click the “Cancel”. Then Calibration is complete.

The reason we do not recommend uploading is to avoid uploading data of malfunctioning X-ray devices or incorrectly performed calibrations.





Note

If you want to change the position of the reader, select different reader position and follow steps 1-14. If you calibrate in a different position, the image may not be good. Therefore, after selecting the correct position, perform "Calibration".

Our Youtube link

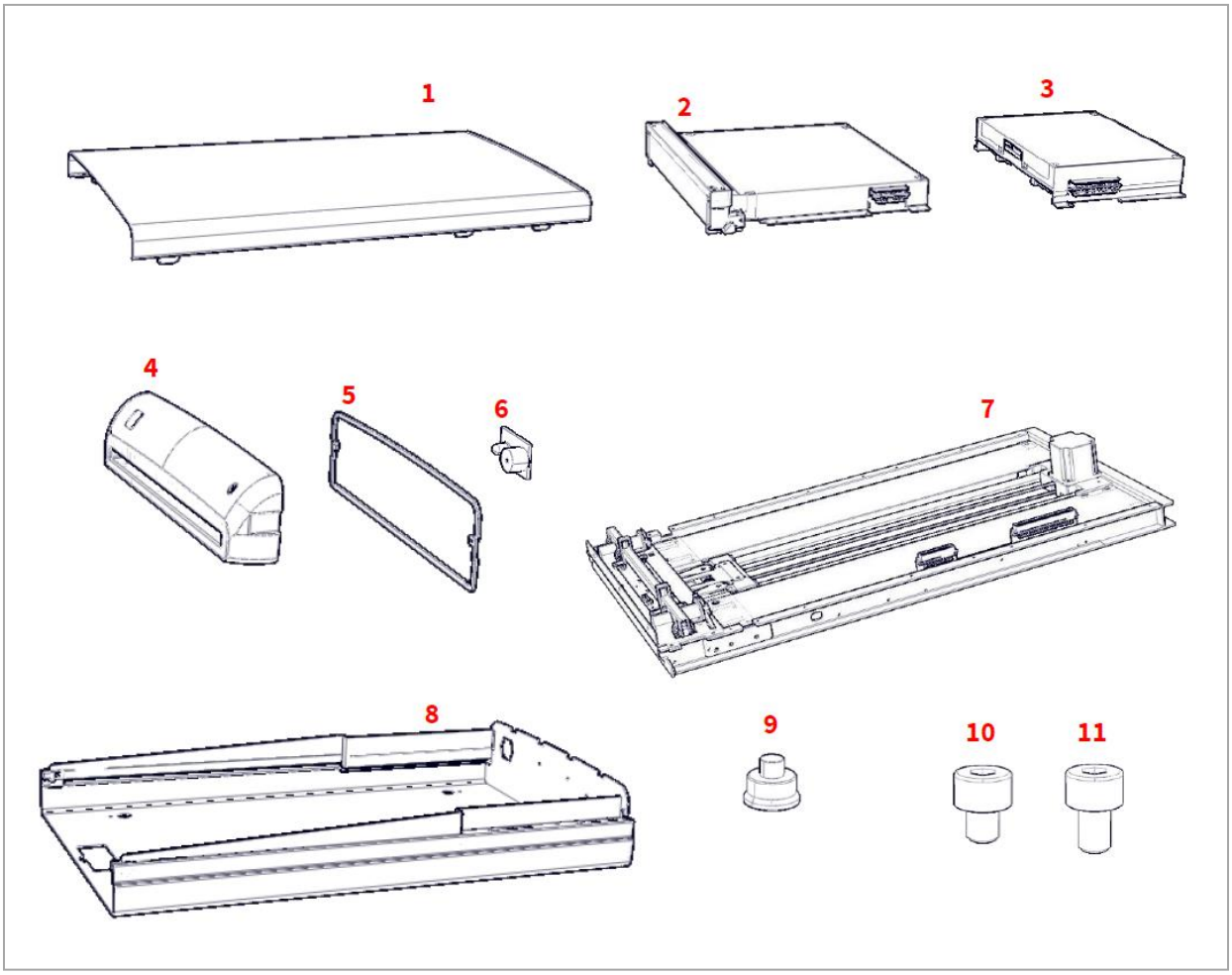
If you would like a reference video for repair and parts replacement, please refer to the link below.

https://www.youtube.com/channel/UCz6zqef9Zq6a9jA3tRMm1zA

Spare part list

- These parts have to be pre-programmed for the individual unit from the factory.

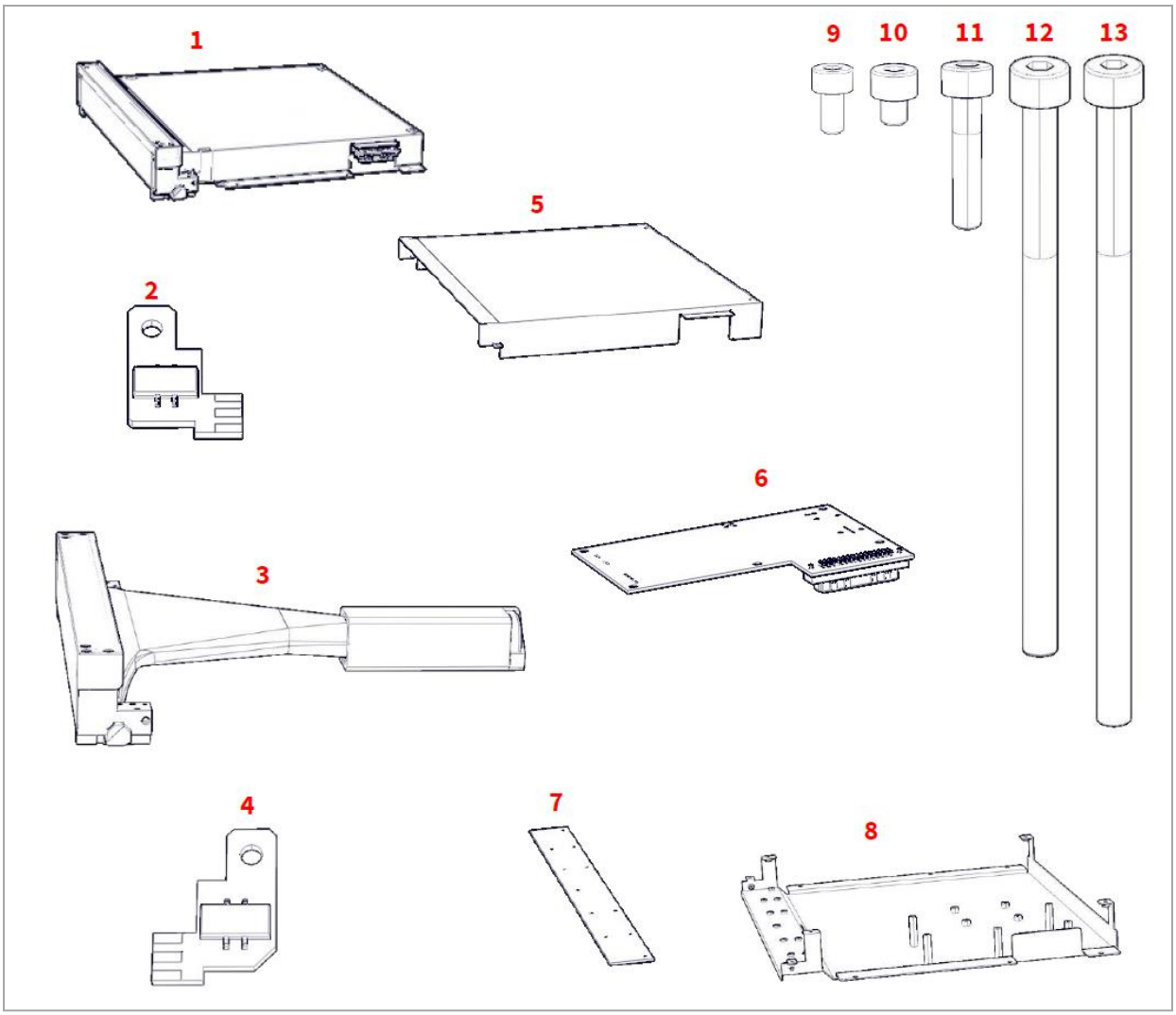
Spare part assemblies



Position	Description	Part number
1	Top cover	CR-CP-41-362
2	Photo Module	CR-CM-41-011
3	Electronics Module	CR-CM-41-016
4	Front cover	CR-CM-41-026
5	Silicone gasket	CR-CP-41-075
6	LED indicator board	CR-CEM-41-007
7	Mechanics module	CR-CM-41-001
8	Bottom cover*	CR-CP-41-363
9	Foot	CR-CP-01-134
10	Screw, hex 4x5mm (bag of 20 pcs)	SCR-20PK-45
11	Screw, hex 4x8mm (bag of 20 pcs)	SCR-20PK-48

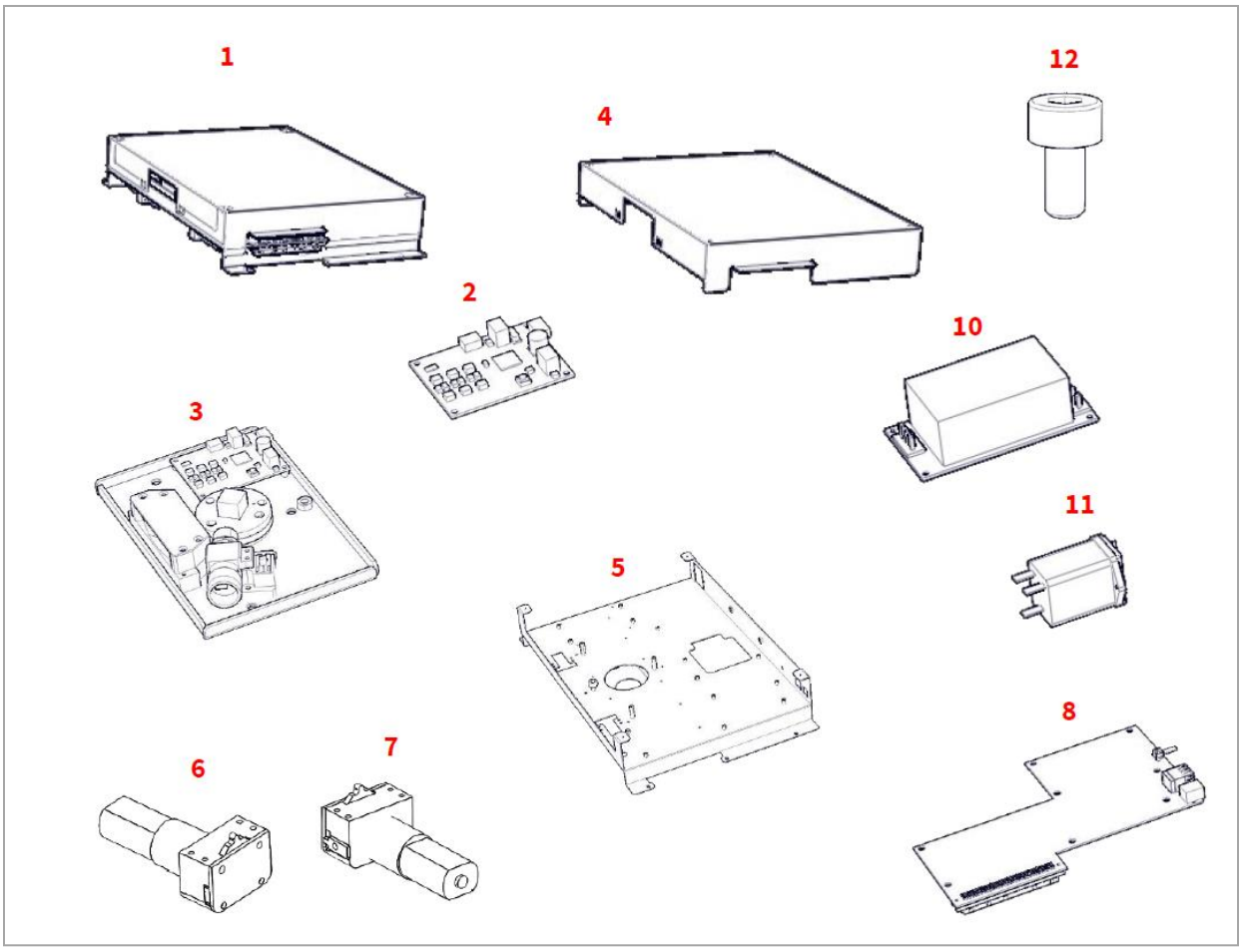
* Serial number label must be ordered for the individual unit

Photo module subassembly list



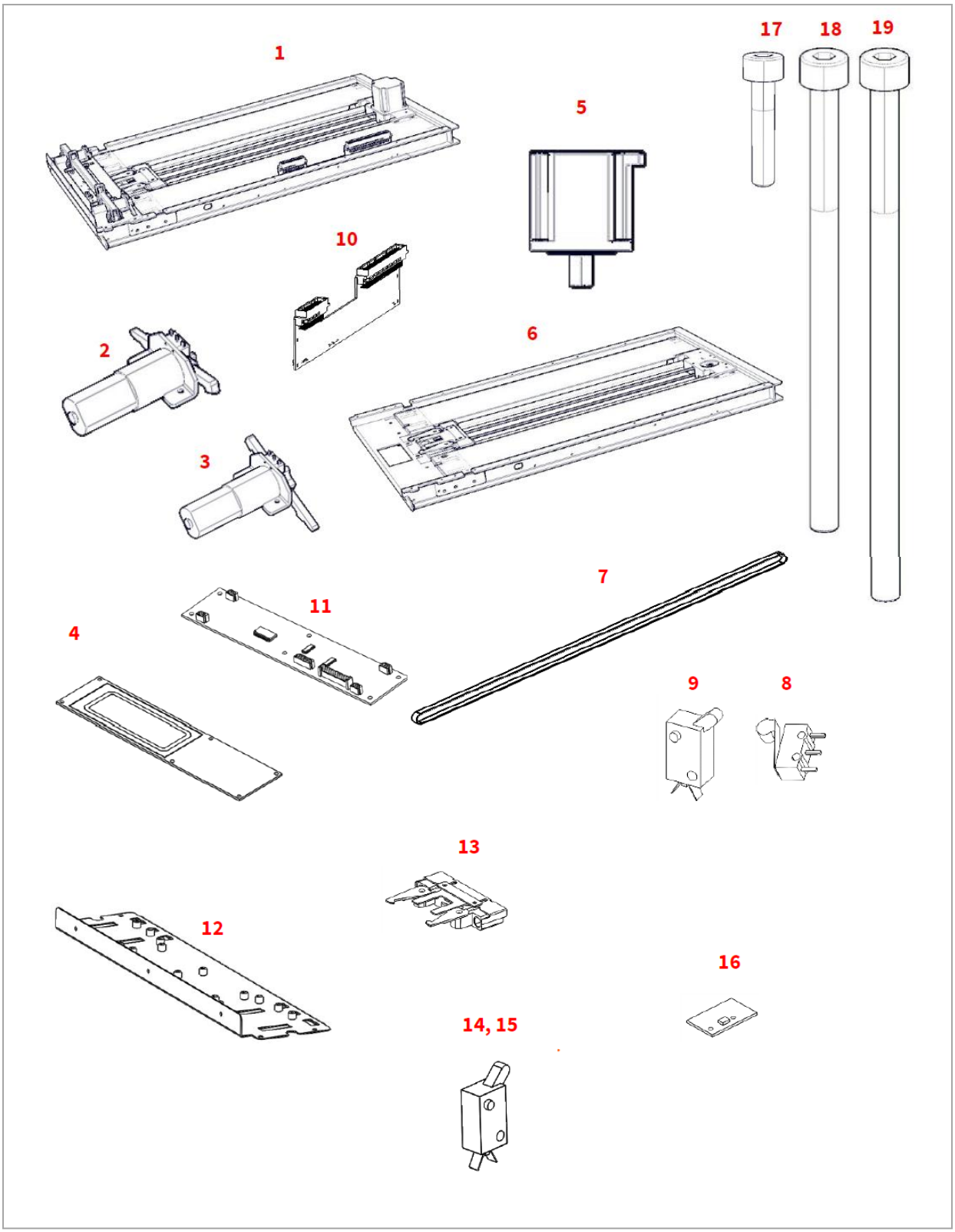
Position	Description	Part number
1	Photo module	CR-CM-41-011
2	PSD, left	CR-CM-41-056
3	PMT and fiber bundle	CR-CE-01-074
4	PSD, right	CR-CM-41-055
5	Photo module cover	CR-CP-41-040
6	Photo module board	CR-CM-41-052
7	Eraser	CR-CEM-41-006
8	Eraser reflector / bottom cover	CR-CP-41-343
9	Screw, hex 3x6mm (bag of 20 pcs)	SCR-20PK-36
10	Screw, hex 4x5mm (bag of 20 pcs)	SCR-20PK-45
11	Screw, hex 4x20mm (bag of 20 pcs)	SCR-20PK-420
12	Screw, hex 4x70mm (bag of 20 pcs)	SCR-20PK-470
13	Screw, hex 4x80mm (bag of 20 pcs)	SCR-20PK-480

Electronics module subassembly list



Position	Description	Part number
1	Electronics module	CR-CM-41-016
2	BLDC driver board	CR-CEM-41-020
3	Laser optics plate	CR-CM-41-324
4	Electronics module cover	CR-CP-41-344
5	Electronics module base plate	CR-CM-41-322
6	Alignment motor, left	CR-CM-41-323
7	Alignment motor, right	CR-CM-41-325
8	Main board	CR-CEM-41-001
9	SD card (not pictured)	CR-CE-41-001
10	Switch mode power supply	CR-CE-41-119
11	Mains power switch	CR-CE-41-006
12	Screw, hex 3x6mm (bag of 20 pcs)	SCR-20PK-36

Mechanics module subassembly list



Position	Description	Part number
1	Mechanics module	CR-CM-41-001
2	Cassette lock motor assembly, right	CR-CM-41-316
3	Cassette lock motor assembly, left	CR-CM-41-315
4	RFID board	CR-CEM-41-057
5	Stepper motor	CR-CM-41-312
6	Stage base frame	CR-CM-41-306
7	Drive belt	CR-CP-41-392
8	Home Switch	CR-CE-41-105
9	Limit Switch	CR-CE-41-106
10	Interconnection board	CR-CEM-41-054
11	Front board	CR-CEM-41-053
12	Cassette top plate	CR-CP-41-323
13	Moving Stage assembly	CR-CM-41-310
14	Cassette switch, left	CR-CE-41-107
15	Cassette switch, right	CR-CE-41-108
16	CTAG sensor	CR-CEM-41-012
17	Screw, hex 4x20mm (bag of 20 pcs)	SCR-20PK-42
18	Screw, hex 4x70mm (bag of 20 pcs)	SCR-20PK-470
19	Screw, hex 4x80mm (bag of 20 pcs)	SCR-20PK-480

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