

Purpose

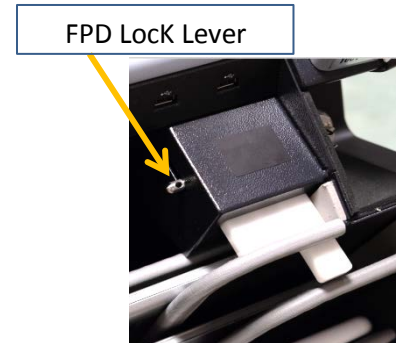
The document is a review of the basic operations of the FDR Go Plus system.

Flat Panel Detector Lock

The detectors can be locked in the storage bin during periods of inactivity.

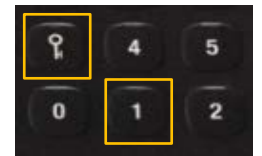
1) Locking the Detectors

- a) Place the detector in the assigned storage bin.
 - i) Rear Slot: 24 x 30 cm
 - ii) Middle Slot: 14 x 17 Inches
- b) Move the Lever to the forward position. The bolt will slide forward, locking the detectors in place.
- c) Manual release of the detector lock is not possible.
- d) **FPdLoc** displays on the X-ray Control Panel when the locking mechanism is activated.



2) Unlocking the Detectors

- a) Depress the Registration Key and the assigned Password Number at the same time.
- b) **FPdLoc** will disappear from the X-ray Control Panel and the locking mechanism will retract, releasing the detectors.
- c) Depressing the Password Number key first and then the Registration key will cause failure of the detector lock. The detector lock will not retract.



Start-Up Procedure

1) Unplug the FDR Go Plus unit from the wall outlet

- a) All status indicator lights on the X-ray Control Panel will turn **OFF**.

2) Turn the Power Switch to the ON position

- a) The Battery indicator on the X-ray Control Panel will activate.

3) PID Security

- a) If PID security is activated, enter the Password.
- b) Upon successful entry, the start-up process will continue.
The system locks are released and the unit is ready for travel.



Battery Level

4) Depress the DR Button

- The DR Button will turn Blue when activated.
- The FDX Console software will automatically start.
- If security is activated, enter the Username and Password.
- The Status indicator lamp will illuminate when startup is complete.

Status Indicator



DR Button

5) Tube Warmup

Tube warmup is a recommended procedure.

- Refer to Tube Warm-up procedure referenced in this document.

Workflow

1) Workflow

- Register a Patient study from the RIS screen.
- Select the required Exposure menu. The KV and mAs values will register on the X-ray Control panel.
- Prep for Exposure
 - X-Ray Prep:
 - Depress the Hand Switch to the first level.
 - The Blue flashing indicators on the X-ray Control Panel, Tube Column and Hand Switch will turn Green.
 - Ensure the Exposure Ready light is Green.
- Complete the Exposure
 - Depress the Hand Switch to the Final Level.
 - At the time of exposure, the X-Ray Exposure Lamp will illuminate and a beep will be heard.
 - The KV & mAs indicators will blink for (5) seconds.
 - The Dose value will display on the X-ray Control Panel.



e) Study Completion and Distribution

- Select the Exam Complete button to send the study to PACS



Shutdown Procedure

1) Shut Down the FDX Console software

- The DR Button will turn **OFF** when the shutdown process is complete.
- Turn the Power switch to the **OFF** position and plug in the unit.
- System charging will initiate based on charging requirements.



Charging Procedures

1) FDR Go Plus Charging

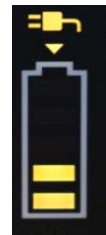
This section is a review of the available charging options.

a) Automatic Charging

When the unit is connected to a wall outlet with the Key Switch set to the **ON** position, automatic charging of the system will occur.

(1) Procedure:

- Plug the unit into a wall outlet.
- Automatic charging will start at the programmed time.
- System charging is indicated by blinking charging indicators on the tube column.
- The battery indicator on the X-ray Control Panel will cycle between 1 & 5 bars until 90% charge level has been reached.



Charging Indicator

b) Manual Charging

This procedure is the most efficient method to restore the system to full charge.

(1) Procedure:

- Shut down the FDX Console and wait for the DR Button to turn **OFF**.
- Set the Power switch to the **OFF** position.
- Connect the unit to a wall outlet.
- When charging is required, the following activity will occur:
 - Blue Status Indicators on the X-ray Control Panel and tube column will start to blink.
 - The Battery Indicator will continually cycle between 1 & 5 bars.
- When the charge level of 90% or greater has been reached, the Battery level indicator will display (5) solid bars.



Battery Charge Level
90% or higher

2) DEVO II Detector Battery Charging

Detector batteries can be charged with a dedicated Battery Charger or Docking Station.

(1) Battery Charger

- (a) Insert the Battery into the charger.
- (b) If properly inserted, the battery charging indicators will turn green.
- (c) Charging Indicators:
 - (i) Charging: Green status lights continually blink.
 - (ii) Charged: (3) solid status lights are displayed.



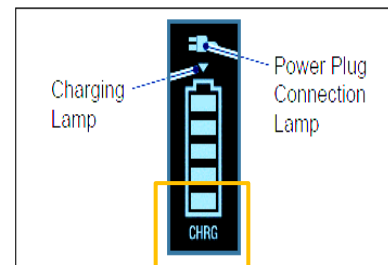
(2) Docking Station

- (a) Refer to the documentation supplied with the equipment.

3) FDR Go Plus Charged Level Indicators

a) Low Charge indicator

- (1) The **CHRG** (Low Battery Notification Lamp) will start to blink when the battery indicator is on the last bar.



b) Charge Indicator (90%)

- (1) Battery Indicator displays (5) solid bars, indicating the battery is 90% charged or higher.
- (2) All blinking status indicators are **OFF**.



c) Full Charge Indicator (100%)

- (1) The Charging Lamp illuminates when the battery charge level reaches 100%.




d) No System Charge (Battery charge level displays no bars)

If there are no visible battery level indicators, a Full system charge is recommended.

The charging durations are as follows:

- (1) 5 hours = 90% charge.
- (2) 8 Hours = 100% charge.
- (3) Charging automatically stops after 10 continuous hours.



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4) Additional Radiography Function

After the battery indicator stops blinking, if additional radiography is needed, approximately 10 more exposures are possible when radiography parameters are set to General Chest Radiography.

1) Procedure:

- a) Turn the Key Switch to the OFF position.
- b) Turn the Key Switch back to the ON position while pressing the User Setting button.
- c) When the LED is blinking on the battery indicator, Low Battery Radiography is possible.
- d) When the system is charged and restarted, automatic connection to the primary battery will occur.



5) Auto-Power-off Function

When the key switch is left in the ON position, the Auto-Power-Off function shuts down several system components after a period of inactivity, conserving battery power.

1) Process:

- a) When Auto-Power Off is initiated, **[at]-[off]** will display on the X-ray Control Panel until the shutdown process is complete.
- b) The status indicator lamp on the X-ray Control Panel and the status lights on the tube column slowly light up blue, indicating the system is partially shut down.
- c) The battery indicator lamp on the X-ray Control Panel will be dim, no bars visible.

6) Wake the system from the Auto-Power-Off State

The Auto Power Off function results in a partial shutdown of system components. The unit can be restored to active status by activating one of the locking devices or using the Key Switch.

1) Activation options:

Activation of the locks is accomplished by touching the designated Release locks.

- a) Brake Release Bar (Drive Handle).
- b) Arm Lock Release (Collimator).
- c) Collimator Release (Grip Handle).
- d) Arm Lock Release Lever.

2) Key Switch

- a) Cycle the Key Switch between the ON and OFF positions.

7) DR Long Time Radiography Mode

Using this option, techniques can be adjusted above the programmed range.

- a) Select a registered Exposure menu.
- b) Select and hold the mAs button for (3) continuous seconds.

DR Long Time Radiography Mode is activated when the LED illuminates.



- c) Set the preferred KV and mAs parameters.
- d) Maximum available mAs: 320 mAs @ 40-65 KV.
- e) Maximum KV: 133KV @ 140 mAs.
- f) When registering a new menu, the DR Long Time Radiography Mode is disabled.

The Green LED button is dim.

8) Cassette Radiography Mode

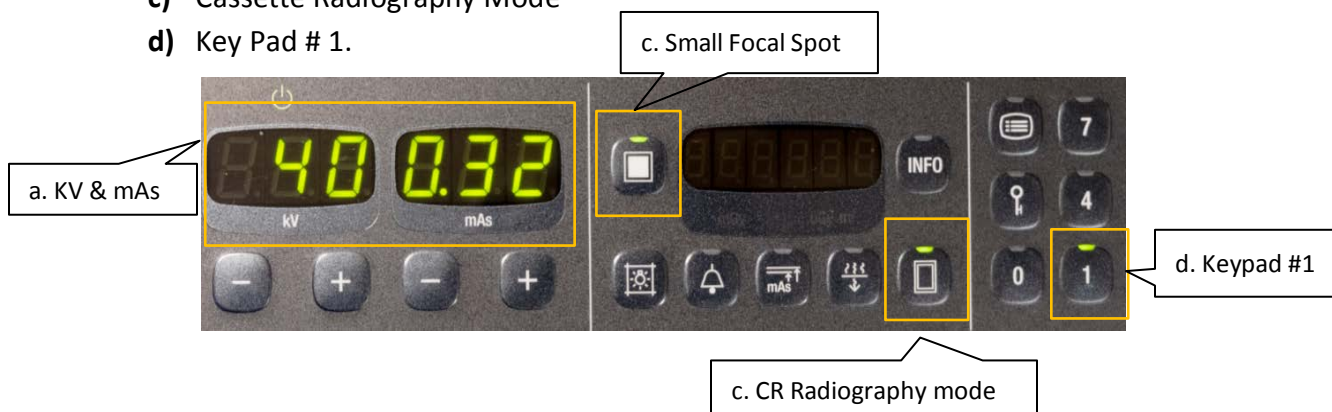
This option is used to activate CR Cassette Radiography.


- 1) Depress the Cassette Radiography Mode button for (3) seconds.
The LED on the Cassette Radiography mode button illuminates and the system switches to Cassette Radiography mode.



- 2) The following tabs automatically highlight:

- a) 40 KV @ 0.32 mAs (default KV & mAs display)
- b) Small Focal Spot
- c) Cassette Radiography Mode
- d) Key Pad # 1.



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- 3) Adjust the KV & mAs parameters.
- 4) Prep and complete the exposure.
- 5) The system will return to normal operating mode upon selection of an Exposure menu. The Green LED indicator will dim.

9) System Travel (Loss of Power)

When system power is not available, system locks do not activate. In order to move the unit, the following procedure is required.

- 1) Procedure:
 - a) Press the Emergency Stop Button.
 - b) Press and hold the Emergency Release button.
 - c) The unit can be safely moved by grasping the hand grip.
 - d) When the Emergency Release button is released, system locks will activate, restricting movement of the system.



Emergency Release

10) Obstruction Detector

If the Obstruction Detector is damaged, the obstruction detection function may remain **ON** (activated), restricting system movement.

- 1) Procedure:
 - a) Turn the key to the **OFF** position.
 - b) Turn the key switch back to the **ON** while pressing the collimator lamp button.
 - c) Continue to press the collimator lamp until the system starts up and emits a sound.
 - d) The obstruction detector cancel function is disabled when the key switch is turned to the **OFF** position.



11) TUBE Warm-Up Procedure

- a) Switch the system to Cassette Radiography Mode by holding down the cassette radiography mode button until the green LED illuminates.
- b) Press the Zero [0] button on the numeric keypad until the green LED illuminates. The system will switch to Tube Warm-up mode.
- c) Tube Warmup Display:
 - i) 50 - N1
 - (1) 50: Initial KV display
 - ii) N1: Determines the number of exposures.



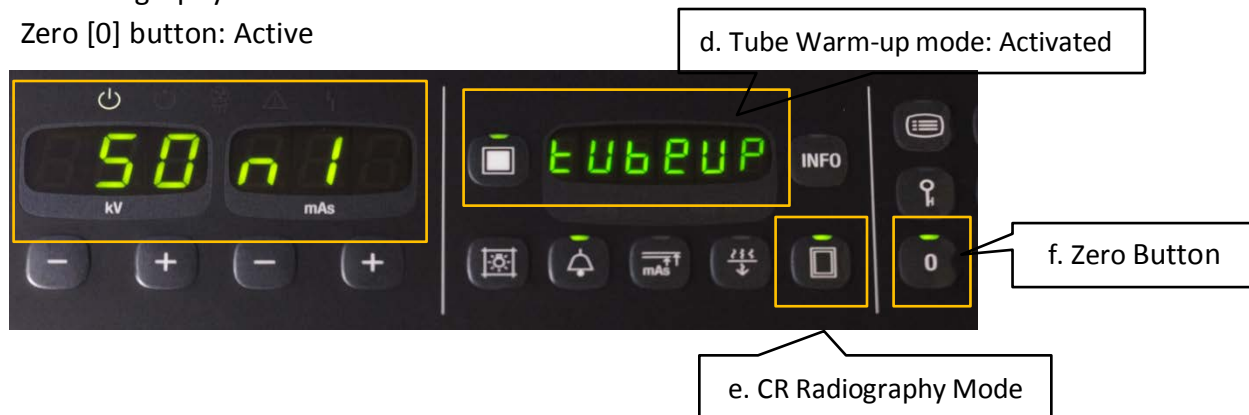
This is the default value when using Tube Warm-Up Procedure 1.

d) [tUbeUP]

a) System is configured for Tube Warm-up mode

e) CR Radiography Mode Button: Active

f) Zero [0] button: Active



g) Tube Warm-Up Procedure 1:

When completing daily tube warm-up, Tube Warm-up Procedure 1 is the required warm-up protocol.

Warmup exposures are taken until the KV for typical first exposure of the day is reached.

| Warm-up Procedure 1 | | | |
|---------------------|-------------------|-----------------|-----------------|
| Step | Tube Voltage (kV) | Number of Times | Pause (seconds) |
| 1 | 80 | 1 | 60 |
| 2 | 90 | 1 | 60 |
| 3 | 100 | 1 | 60 |

h) Tube Warm-up Protocol:

a) Close the collimator blades.

b) Set the KV to 80.

c) mAs: N1 (do not modify)

d) Make the 1st exposure.

i) The KV display will blink for a few seconds and change to 90 KV.

ii) Wait 60 seconds between exposures.

e) Repeat the process until the desired KV is reached.

f) Exit the tube warmup mode by pressing a Keypad number between [1] and [9].

g) The [tUbeUP] is cleared from the console display and the system switches to Cassette Radiography mode.

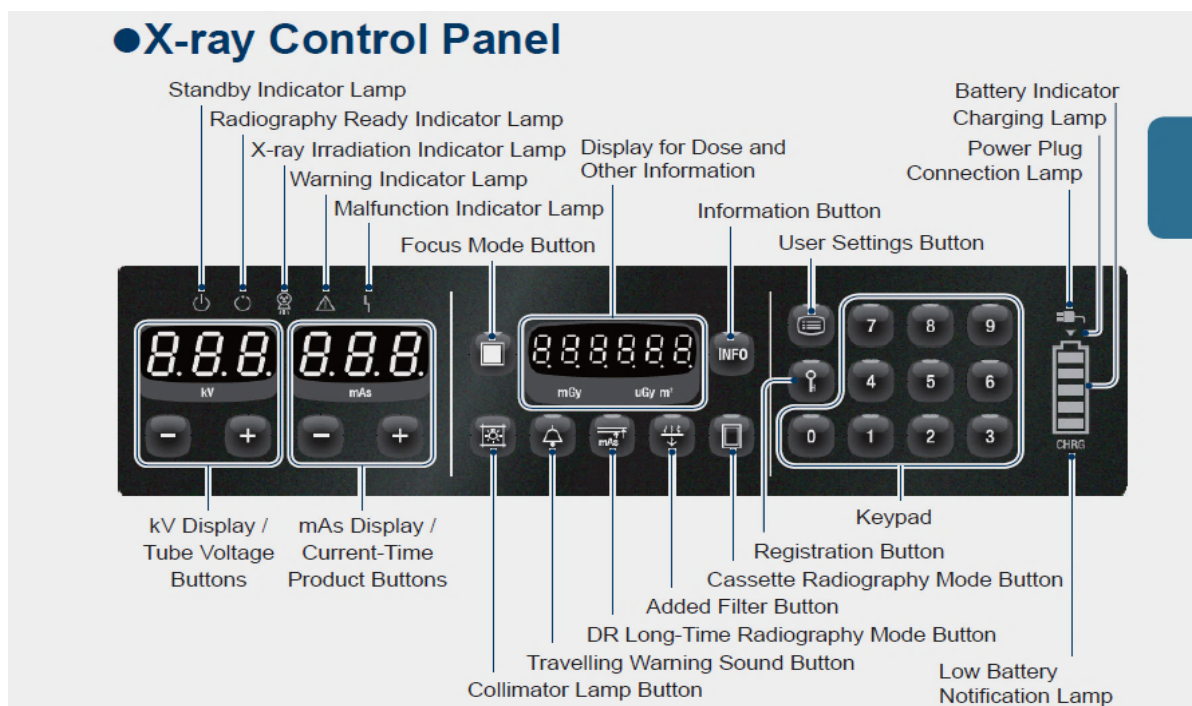
h) Registering a menu will return the system to normal DR mode.


12) Dose Reduction Concepts














Minimizing Dose requires evaluation of pre-exposure technical parameters and post exposure results.


- 1) Smart QA
 - a) Automatic exposure alerts for examinations with reference values outside of the programmed range
- 2) "S" Value and Exposure Index Reference Charts
 - a) Use the reference ranges to adjust KV and mAs values to an optimal range
- 3) ALARA: As Low As Reasonable Achievable
- 4) Image Gently: Pediatric Dose Reduction Program
- 5) Image Wisely: Adult Dose Reduction Program








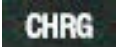
13) X-ray Control Panel



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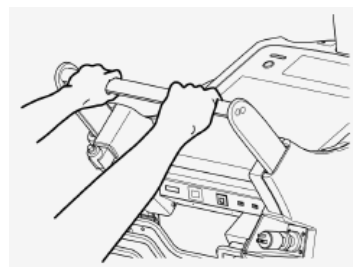
| 1 | Standby Indicator Lamp |  | <ul style="list-style-type: none"> • Illuminates when system is ready for X-ray • |
|----|---|---|---|
| 2 | Radiography Ready Indicator Lamp |  | <ul style="list-style-type: none"> • Activates during system Prep |
| 3 | X-Ray Irradiation Indicator Lamp |  | <ul style="list-style-type: none"> • This button will flash at the time of exposure |
| 4 | Warning Indicator Lamp |  | <ul style="list-style-type: none"> • Illuminates when the system does not function correctly. • Red warning indicator displays on console |
| 5 | Malfunction Indicator Lamp |  | <ul style="list-style-type: none"> • Illuminates if system malfunctions |
| 6 | Focus Mode Button |  | <ul style="list-style-type: none"> • Focal spot size controlled by exposure menu • Large Focus: LED Off • Small Focus: LED Illuminated |
| 7 | Display for Dose and other information |  | <ul style="list-style-type: none"> • Displays Dose value after each exposure • Displays User Setting options • Displays info based on selected functions |
| 8 | Information Button |  | <ul style="list-style-type: none"> • Displays APR Code for the active menu • Press to view all User Setting options |
| 9 | KV Display/Tube Voltage |  | <ul style="list-style-type: none"> • Adjust KV parameters • Adjusts User Setting default parameters • |
| 10 | mAs Display/Current-Time Product Button |  | <ul style="list-style-type: none"> • Adjust mAs values • Adjusts User Setting parameters • Displays Error Codes |
| 11 | Collimator Lamp Button |  | <ul style="list-style-type: none"> • Switches collimation Lamp On or OFF • Used in combination with the Key switch to activate the Obstruction Detector Cancel Function |
| 12 | Travelling Warning Sound Button |  | <ul style="list-style-type: none"> • Used to set the volume of the sound emitted during x-ray exposure or when radiography preparation is finished |
| 13 | DR Long Time Radiography Mode Button |  | <ul style="list-style-type: none"> • Switches system to DR Long time mode (LED Illuminated) • Normal Mode(Not Illuminated) |

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|----|----------------------------------|---|---|
| 14 | Added Filter Button |  | <ul style="list-style-type: none"> LED illuminates when added filter is inserted No added filter: No LED Added Filter 1: LED Illuminated Added Filter 2: LED Blinking |
| 15 | Cassette Radiography Mode Button |  | <ul style="list-style-type: none"> Switches system to Cassette Radiography mode. (LED Illuminated) DR Radiography mode: (Not Illuminated) |
| 16 | User Settings Button |  | <ul style="list-style-type: none"> Switches the system to User Setting When the keyless entry(option) is used, this button functions as the enter key |
| 17 | Registration Button |  | <ul style="list-style-type: none"> Registers anatomical programs and various settings When Keyless entry(option), this button functions as the Enter Key |
| 18 | Keypad | | <ul style="list-style-type: none"> Keypad for data entry |
| 19 | Power Plug Connection Lamp |  | <ul style="list-style-type: none"> Illuminates when the power plug is connected to a wall outlet |
| 20 | Charging Lamp |  | <ul style="list-style-type: none"> Blinks when system is charging Solid indicator when system is at 100 % Full Charge |
| 21 | Battery Indicator |  | <ul style="list-style-type: none"> Indicates the Battery Charge Level |
| 22 | Low Battery Notification |  | <ul style="list-style-type: none"> Charge indicator blinks when the battery indicator is on the last bar |

14) System Safety

- 1) To move the unit, firmly grip the grip bar with both hands and then move forward.
- 2) Do not move the system over any steps or bumps greater than 2 cm, or slopes steeper than 7 degrees, Always stop the system on a level surface and avoid sloped surfaces.
- 3) Do not lay your hands on the bar retaining cover when holding the grip bar.
If you hold the grip bar while laying your hand on the cover, a force may apply toward the rear, causing the mobile system to suddenly accelerate and move forward.

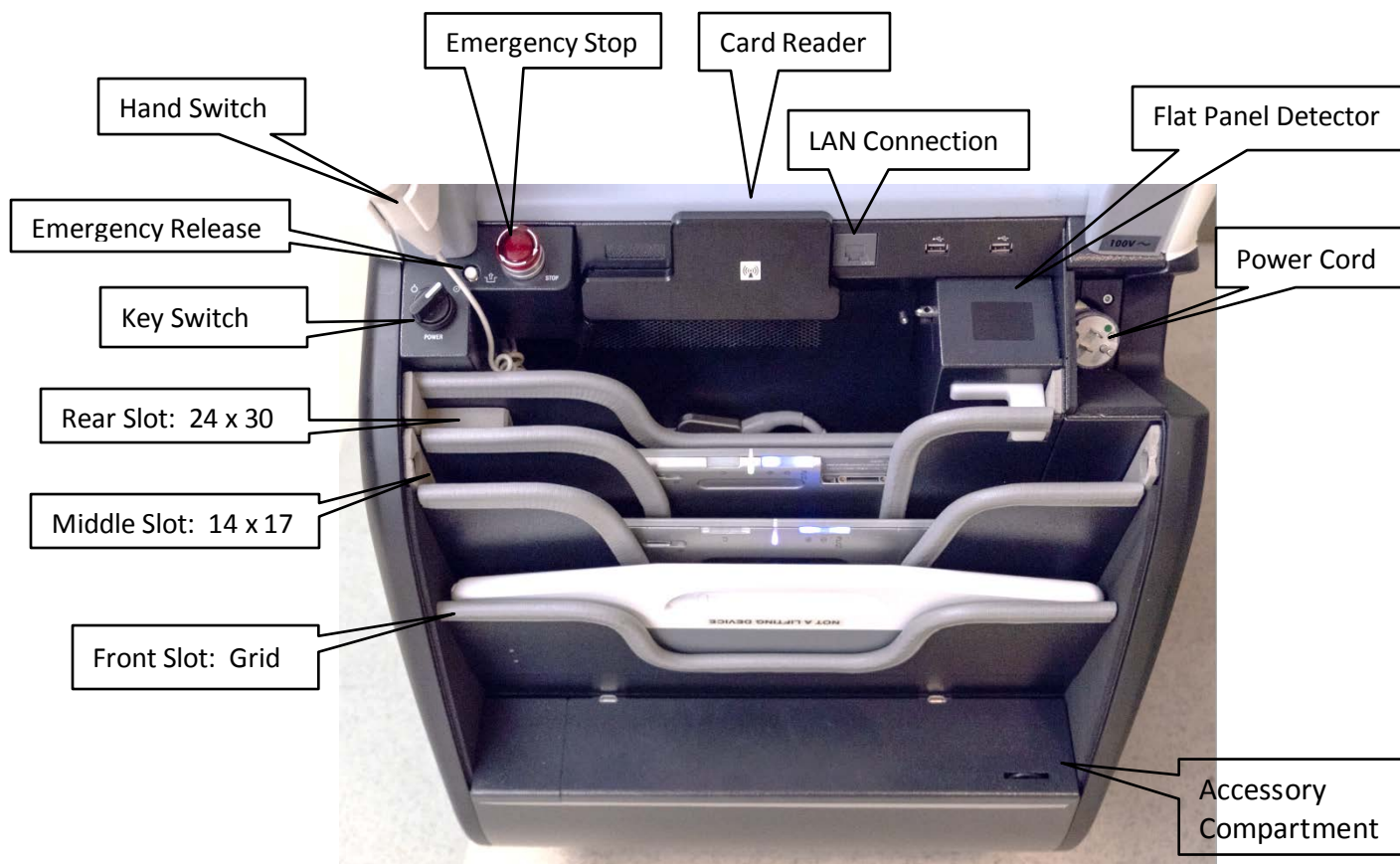


15) Support Documents

- 1) Quick Guide on Console Workflow (FDX V11.0)
 - a) This document is a detailed workflow manual for the FDX Console
 - b) Document number: DOC-0038010
- 2) FDR Go Plus Operation Guide # M503-E076
 - a) Detailed Operation manual for the FDR Go plus
 - b) Document Number:
- 3) FDR GO (Plus Version) Reference Guide
 - a) Additional information on operation basics
 - b) Document number: # 503-E072

16) System Components

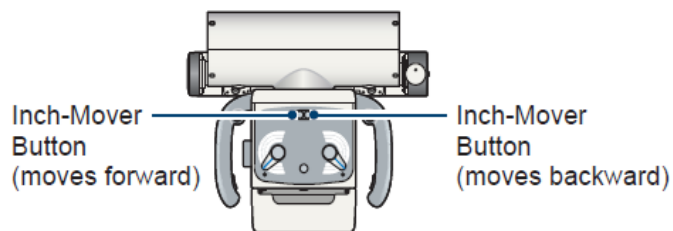
- 1) Back Panel
 - a) Note: Several of the slots and accessory components have openings in the bottom.



b) Inch Mode

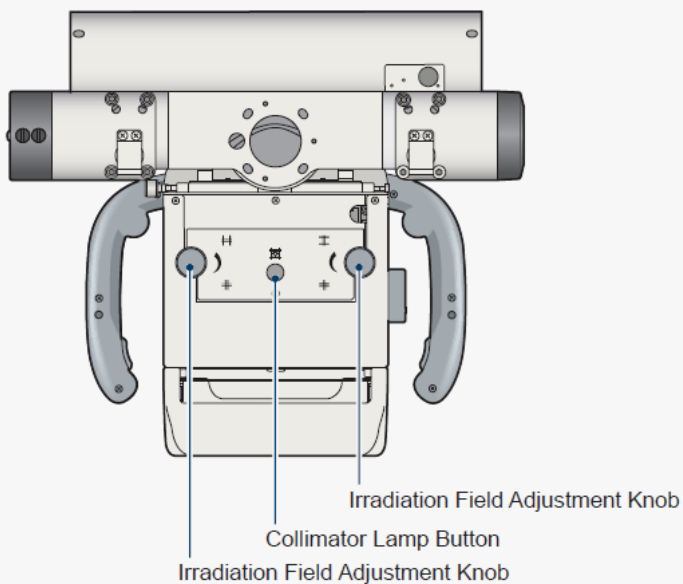
NOTE

Use the collimator inch-mover button to move the system slowly forward and backward.
Use this to make fine positioning adjustments.



c) Tube Column

• Back



• Front

