B-RAD X
USER MANUAL

USER MANUAL FOR:
- B-RAD X 7000
- B-RAD X 10K
- B-RAD X 15K

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TABLE OF CONTENTS

GENERAL INSTRUCTIONS

> **! NOTE:**
> *Do not operate the tool before reading these instructions. If breakdown, malfunction or damage occurs, do not attempt to repair, please contact Radial Torque Tools B.V. immediately.*

RAD battery torque wrenches are reversible, non-impacting, torque controlled tightening tools and must always be operated with the following:

- Fully charged battery.
- Impact sockets with locking pin and o-ring.
- Proper reaction arm with retaining ring.

> **! NOTE:**
> *These torque wrenches contain metal components that can be dangerous in hazardous areas.*

> **! WARNING!**
> *Read all safety warnings, instructions, illustrations, and specifications provided with this power tool. failure to follow all instructions listed below may result in electric shock, fire and/or serious injury. Save all warnings and instructions for future reference.*

GENERAL POWER TOOL SAFETY WARNINGS

The term "power tool" in the warnings refers to your battery-operated (cordless) power tool.

1. Work Area Safety
   a. **Keep work area clean and well lit.** Cluttered and dark areas invite accidents.
   b. **Do not operate power tools in explosive atmospheres, such as in the presence of flammable liquids, gases, or dust.** Power tools create sparks which may ignite the dust or fumes.
   c. **Keep children and bystanders away while operating the power tool.**
      Distractions can cause you to lose control.

2. Electrical Safety
   a. **Power tool plugs must match the outlet. Never modify the plug in any way. Do not use any adapter plugs with earthed (grounded) power tools.** Unmodified plugs and matching outlets will reduce the risk of electric shock.
   b. **Avoid body contact with earthed (grounded) surfaces such as pipes, radiators, ranges, or refrigerators.** There is an increased risk of electric shock if your body is earthed (grounded).
   c. **Do not expose power tools to rain or wet conditions.** Water entering a power tool will increase the risk of electric shock.
   d. **Do not abuse the cord. Never use the cord to carry, pull, or unplug the power tool. Keep cord away from heat, oil, sharp edges, and moving parts.** Damaged or entangled cords increase the risk of electric shock.
   e. **When operating a power tool outdoors, use an extension cord suitable for outdoor use.** Use of a cord suitable for outdoor use reduces the risk of electric shock.
   f. **If operating a power tool in a damp location is unavoidable, use a Ground Fault Circuit Interrupter (GFCI) protected supply.** Use of a GFCI reduces the risk of electric shock.

3. Personal Safety

a. **Stay alert, watch what you are doing, and use common sense when operating a power tool. Do not use a power tool while you are tired or under the influence of drugs, alcohol, or medication.** A moment of inattention while operating power tools may result in serious personal injury.

b. **Use personal protective equipment and always wear eye protection.** Protective equipment such as a dust mask, non-skid safety shoes, hard hat, and hearing protection used in appropriate conditions will reduce personal injuries.

c. **Prevent unintentional starting. Ensure the switch is in the off position before connecting to a power source and/or battery pack, picking up, or carrying the tool.** Carrying power tools with your finger on the switch or energizing power tools that have the switch on invites accidents.

d. **Remove any adjusting key or wrench before turning the power tool on.** A wrench or a key left attached to a rotating part of the power tool may result in personal injury.

e. **Do not overreach. Always keep proper footing and balance.** This enables better control of the power tool in unexpected situations.

f. **Dress properly. Do not wear loose clothing or jewellery.** Keep your hair, clothing, and gloves away from moving parts.

g. **If devices are provided for the connection of dust extraction and collection facilities, ensure these are connected and properly used.** Use of dust collection can reduce dust-related hazards.

h. **Do not let familiarity gained from frequent use of tools allow you to become complacent and ignore tool safety principles.** A careless action can cause severe injury within a fraction of a second.

4. Power Tool Use and Care

a. **Do not force the power tool.** Use the correct power tool for your application.

b. **Do not use the power tool if the switch does not turn it on and off.** A power tool that cannot be controlled with the switch is dangerous and must be repaired.

c. **Disconnect the power source and/or the battery pack from the power tool before making any adjustments, changing accessories, or storing power tools.** Such preventive measures reduce the risk of starting the power tool accidentally.

d. **Store idle power tools out of the reach of children and do not allow persons unfamiliar with the power tool or these instructions to operate the power tool.** Power tools are dangerous in the hands of untrained users.

e. **Power tools must be properly maintained. Check for misalignment or binding of moving parts, breakage of parts, and any other condition that may affect the power tool's operation.** If damaged, have the power tool repaired before use. Many accidents are caused by poorly maintained power tools.

f. **Use the power tool and accessories in accordance with these instructions, considering the working conditions and the work to be performed.** Use of the power tool for operations different from those intended could result in a hazardous situation.

g. **Keep handles and grasping surfaces dry, clean, and free from oil and grease.** Slippery handles and grasping surfaces do not allow for safe handling and control of the tool in unexpected situations.

5. Battery tool use and care

a. **Recharge only with the charger specified by the manufacturer.** A charger that is suitable for one type of battery pack may create a risk of fire when used with another battery pack.

b. **Use power tools only with specifically designated battery packs.** Use of any other battery packs may create a risk of injury and fire.

c. **When battery pack is not in use, keep it away from other metal objects, like paper clips, coins, keys, nails, screws, or other small metal objects that can make a connection from one terminal to another.** Shorting the battery terminals together may cause burns or a fire.

d. **Under abusive conditions, liquid may be ejected from the battery; avoid contact. If contact**

accidentally occurs, flush with water. If liquid contacts eyes, additionally seek medical help.** Liquid ejected from the battery may cause irritation or burns.

    e. **Do not use a battery pack or tool that is damaged or modified.** Damaged or modified batteries may show unpredictable behaviour resulting in fire, explosion, or risk of injury.

    f. **Do not expose a battery pack or tool to fire or excessive temperature.** Exposure to fire or temperature above 130 °C (265 °F) may cause explosion.

    g. **Follow all charging instructions and do not charge the battery pack or tool outside the temperature range specified in the instructions.** Charging improperly or at temperatures outside the specified range may damage the battery and increase the risk of fire.

6. Service

    a. **Have your power tool serviced by a qualified repair person using only identical replacement parts.** This will ensure that the safety of the power tool is maintained.

    b. **Never service damaged battery packs.** Service of battery packs should only be performed by the manufacturer or authorized service providers.

BATTERY PACK SAFETY WARNINGS

    a. **Only use the RAD HD Battery Pack with the B-RAD X Tool System.** The use of other batteries with the B-RAD X Tool System will cause damage to the tool.

    b. **The RAD HD Battery Pack should only be charged on the RAD HD Battery Charger.** If an incompatible charger is used, damage to the RAD HD Battery will occur.

    c. **Keep the RAD HD Battery Pack away from any metal objects.** If the battery terminals are connected by a metal object, the battery will short and will cause damage to the battery and injury to the operator.

    d. **Do not expose the RAD HD Battery Pack to wet conditions.** This will cause damage to the RAD HD Battery and increase the risk of electric shock.

    e. **Do not use faulty or deformed RAD HD Batteries. Do not attempt to open the RAD HD Battery. Do not short circuit the RAD HD Battery.** Failure to comply will cause damage to the RAD HD Battery and injury to the operator.

    f. **If liquid is ejected from the RAD HD Battery, avoid contact. If contact with skin occurs, immediately flush with water. If contact with eyes occurs, immediately flush with water and seek medical aid.** Liquid from the RAD HD Battery may cause irritation and/or burns.

    g. **RAD HD Battery Packs cannot be disposed of with regular waste.** Dispose of RAD HD Batteries according to local regulations or return RAD HD Batteries to your RAD Distributor.

1. General Information

1.1. System Components

The B-RAD X Tool System is shipped in a custom foam-lined storage case with the following parts:

- B-RAD X Tool (Figure 1.1-1)
- Two RAD HD Battery Packs (Figure 1.1-2)
- RAD Battery Charger (Figure 1.1-3)
- Standard Reaction Arm and Snap Ring (Figure 1.1-4)
- Calibration Certificate
- User Manual

Figure 1.1-1: B-RAD X

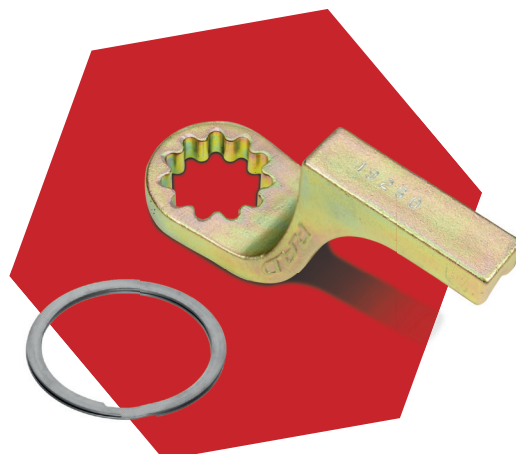*Figure 1.1-2: RAD HD Battery Pack*

Figure 1.1-3: RAD Battery Charger

Figure 1.1-4: Standard Reaction Arm and Snap Ring

1.2. Specifications

1.2.1. Tool Model Specifications

The following table outlines the torque ranges, speed, and weight of the BRAD X models.

Tool Model	Torque Range (Imperial)	Torque Range (Metric)	Speed	Weight (incl. battery)
B-RAD X 5000 / 7000-M	500 – 5000 ft·lb	700 – 7000 N·m	2.4 RPM	23.2 lb / 10.5 kg
B-RAD X 8000 / 10K-M	740 – 8000 ft·lb	1000 – 10850 N·m	1.7 RPM	30.3 lb / 13.8 kg
B-RAD X 11k / 15K-M	1100 – 11000 ft·lb	1500 – 15000 N·m	1.2 RPM	42.4 lb / 19.3 kg

Table 1.2.1-1: Tool Model Torque Ranges and Weights

1.2.2. Battery Specifications

Ensure that all Battery Specifications are followed when using the B-RAD X Tool System.
Use only RAD HD series 18V batteries.

Battery	
Voltage	18VDC Nominal 13.5 - 43V Maximum
Current	120 ADC Peak
Capacity[1]	5.5 Ah or 8 Ah batteries
State of Battery Charge Battery Empty Electronic Awake Over Voltage, Wire Break	**LED-Display** LED1>20%, LED2>40%, LED3>60%, LED4>80% LED1<20%, 3 times flashing LED4, short flashing each 15s LED1, LED2, and LED4, short flashing each 15s
Weight	5.5 Ah - 845g / 1.9 lb 8 Ah - 977g / 2.2 lb
Operating Temperature	-20°C - 50°C / -4°F - 122°F
Storage Temperature	-20°C - 60°C / -4°F - 140°F
Vibrations and Shock	< 5G, (x-, y-, z- axis)
Humidity	< 90% (non-condensing)
Dust / Moisture Protection	IP20
Charger Voltage	
Input	115 or 230 VAC
Output	12 - 18 VDC
Charger Output Current	2.5 A
Operating Temperature	0°C - 40°C / 32°F - 104°F
Storage Temperature	-40°C - 75°C / -40°F - 167°F
Charge Time	5.5 Ah < 110 minutes 8 Ah < 160 minutes

[1]5.2 Ah and 10 Ah batteries can be used, but performance may be reduced.

1.2.3. Environmental Specifications

> ⚠ **CAUTION!**
> *Only operate the B-RAD X Tool System if the following storage and operation conditions have been met.*

	All Models	
	°C	°F
Ambient Operating Temperature Range	0 – 40	32 – 104
Storage Temperature Range	-20 – 70	-4 – 158
Required Operating Conditions	Non-explosive atmosphere, dry location	
Humidity	10% to 90% non-condensing	
Shock	10G according to DIN IEC 68-2-6/29	
Vibration Emission / Uncertainty = K	Does not exceed 2.5 m/s² ; K = 1.5dB	
Noise Emissions		
A-weighted sound pressure level - LpA	Does not exceed 75dB(A)	
w Uncertainty = K	86.0dB(A); K = 1.51dB	

Table 1.2.3-1: Environmental Specifications

Note: *The declared vibration total value has been measured in accordance with a standard test method and may be used for comparing one tool with another and may be used in a preliminary assessment of exposure.*

> ⚠ **WARNING!**
> *The vibration emission during actual use of the power tool can differ from the declared total value depending on the ways in which the tool is used. Identify safety measures to protect the operator that are based on an estimation of exposure in the actual conditions of use (taking account of all parts of the operating cycle such as the times when the tool is switched off and when it is running idle in addition to the trigger time).*
> ⚠ **CAUTION!**
> *It is recommended that the operator wears hearing protection.*

1.2.4. Cycle of Operation

A Cycle of Operation or a Tool Cycle as used in this manual is defined as:
- 10 seconds On (Forward or Reverse)
- 5 seconds Off

Note: the "on" here is defined as where torque is applied to the system.
Note: An actual Torque Cycle may vary from the general definition above.

2. Tool System

The following sections introduce the operation of the Tool Handle, Reaction Arm, LED Display Interface, RAD HD Battery Pack, and RAD Battery Charger.

2.1. Tool Handle

The B-RAD X (Figure 2.1-1) is activated with a Trigger Switch. Torque values and tool information are displayed on 5-digit LED display. Four buttons are used to enter the desired torque setting and view the menus. The RAD HD Battery Pack is attached to the bottom of the Tool Handle.

1. Trigger Switch – tool activation
2. LED Display Module with 4 Buttons – refer to Section 2.2 Tool Interface
3. RAD HD Battery Pack – refer to Section 2.3 RAD HD Battery Pack
4. Battery Release Button and Lock - refer to Section 2.3.1 Insert/Remove the RAD HD Battery Pack
5. Reaction Arm
6. Fan Filter
7. Hand Guard
8. Hanger (not shown)
9. Snap ring (not shown)

2.2. Tool Interface

> **CAUTION!**
> *The Display Module may be damaged by mechanical shock, electrostatic discharge, excessive force, moisture, or extreme temperatures. Avoid such conditions and gently wipe clean or let dry before use.*

To turn on the LED Display, attach the RAD HD Battery to the B-RAD X handle and press the Trigger Switch momentarily.

The LED Display has a 5 digit display to show the torque values and menu options, LEDs for indicating both forward and reverse directional rotation, LEDs to indicate the type of Units the tool is operating in, and 4 buttons that can be used to change settings and navigate menus.

The Trigger is disabled when entering the menu system. Only certain sub menu systems will allow the tool to operate.

The entire tool will shut down after 10 minutes of inactivity. To turn the tool back on, press the Trigger Switch once and the system will restart.

2.2.1. Keypad

The keypad consists of 4 buttons that are located on either side of the LED Display.

- **Enter Button:** used to open the main menu and enter the sub-menus. It is also used to save a value that has been set.
  - **Long Press:** opens the main menu when on the Main Screen.
  - **Short Press:** selects the sub-menu when in the Menus.

- **Back Button:** used to move back one level when in the Menus and toggle the direction between Forward and Reverse when Torque Operation is enabled.
  Note: most menus disable Torque Operation and thus also the ability to change the direction.
  - **Double Short Press:** moves back one level in the menu.
  - **Long Press:** toggles direction between Forward and Reverse (disabled in most menus).

- ✚ (plus): increments values and navigates through menus.
- ▬ (minus): decrements values and navigates through menus.

Note: A long press is 3-5 seconds.
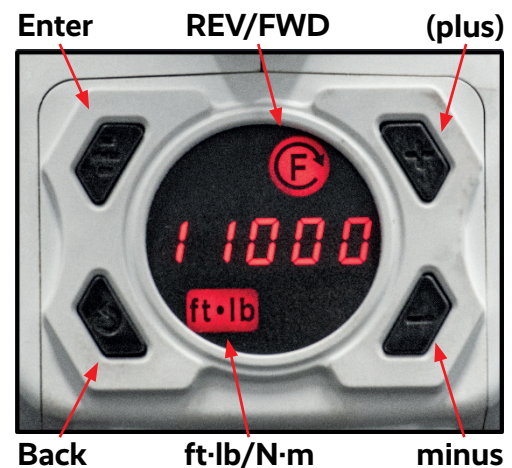
Figure 2.2.1-1: Tool Interface

2.2.2. Main Screen

The Main Screen is the central interface for the B-RAD X Tool System. The Target Torque, Torque Units, and Rotational Direction are displayed on the Main Screen. Figure 2.2.1-1 shows the layout of the Main Screen.

2.2.3. Audible Status Indicator

The B-RAD X has audible status indicators that inform the user of the tool's status. It will beep every time a button is pressed and to indicate the saving of a value that has been changed. There are a few audible statuses:

- **Start Up:** chime.
- **Button Press:** short beep.
- **Saved:** pitch up and down sweeping sound.
- **Error:** two short beeps then a pause before repeating.
- **Fault:** short beep followed by a lower pitch long beep.

To enable or disable these sounds please see Section 3.4.6 Audio Indication Setting.

2.3. RAD HD Battery Pack

> **CAUTION!**
> *Only use the RAD HD Battery Pack with the B-RAD X Tool System. Using third-party batteries may damage the B-RAD X Tool System.*
> *Keep the RAD HD Battery Pack away from any metal objects. If the battery terminals are connected by a metal object, the battery will short and cause damage to the battery and injury to the operator.*

The RAD HD Battery Pack supplies power to the tool; for the B-RAD X to perform best, ensure the RAD HD Battery is fully charged and in good condition before use.

Note: The application torque, joint hardness, battery condition, age, and operating temperature will affect the actual number of Torque Cycles per charge.

2.3.1. Insert/Remove the RAD HD Battery Pack

To insert the RAD HD Battery:

1. Ensure the Trigger is not depressed.
2. Align the RAD HD Battery with the bottom of the Tool Handle.
3. Slide the RAD HD Battery into place until it is fully seated.

Note: A click will confirm that the RAD HD Battery is locked in place.

4. Check that the RAD HD Battery is locked in place by trying to slide it out of place.
5. For extra safety, slide the red Battery Lock Latch to the right to lock the Battery Release Button in place (Figure 2.3.1-1).

To remove the RAD HD Battery:

1. If in the locked position, slide the red Battery Lock Latch to the left to unlock.
2. Press and hold the Battery Release Button and slide the RAD HD Battery away from the Tool Handle.

Battery Lock Latch

Figure 2.3.1-1: Battery Release and Lock Out

2.3.2. Check RAD HD Battery Charge

To check the RAD HD Battery Charge:

• Press the "Charge" button on the RAD HD Battery (Figure 2.3.2-1).

Result: The green bars will light up. If all the bars are illuminated, the Battery is fully charged. If only one of the bars is illuminated, the RAD HD Battery is discharged and needs charging (refer to Section 2.4.1 Charging the RAD HD Battery Pack).

Note: When the battery charge gets too low, the "LoBatt7" will be displayed on the tool LED Display.

Charge Button

Figure 2.3.2-1: RAD HD Battery Pack

2.4. RAD Battery Charger

> ⚠️ **CAUTION!**
> *The RAD HD Battery Pack should only be charged on the RAD Battery Charger. If an incompatible charger is used, damage to the RAD HD Battery will occur.*

The Charging Status Display (Figure 2.4-1) indicates when the RAD HD Battery is charging, when the charge is complete, and if there is an error.

Green Status Light

Red Warning Light

Figure 2.4-1: Charging Status Display

2.4.1. Charging the RAD HD Battery Pack

If the battery was discharged under heavy load, the charger may indicate a battery overtemperature (Solid red warning light). This is normal. Keep the battery on the charger while the battery cools. The charging process will start automatically after about 15 to 30 minutes.

Note: The temperature range for charging is 0°C to 50°C (32° F to 122° F).

To charge the RAD HD Battery:
1. Plug the RAD Battery Charger into the wall outlet. The Red Warning Light will turn on for one second and then the Green Status Light will turn on for one second.
2. Align the RAD HD Battery with the RAD Battery Charger.
3. Slide the RAD HD Battery into place. The Green Status Light will flash while the RAD HD Battery is charging.

When the RAD HD Battery has been fully charged, the Green Status Light will stop flashing and stay illuminated. Until the RAD HD Battery is removed from the RAD Battery Charger, the Charger will maintain the battery charge at maximum capacity.

To remove the RAD HD Battery:
1. Slide the RAD HD Battery away from the RAD Battery Charger.
2. Check that the RAD HD Battery is fully charged (refer to Section 2.4 RAD HD Battery Charge).

2.4.2. Charging Errors

The Red Warning Light is on:
The RAD HD Battery is not charging because its temperature is not within the required temperature range for charging. When the RAD HD Battery's temperature changes to within the required range, the Red Warning Light will turn off and charging will start.

The Red Warning Light is flashing:
The RAD HD Battery may be placed incorrectly on the RAD Battery Charger. Remove the RAD HD Battery and replace it correctly on the RAD Battery Charger. If the Red Warning Light continues to flash, the RAD HD Battery is defective; remove the RAD HD Battery immediately.

If these problems continue, contact Radial Torque Tools B.V. Technical Support (refer to Section 6. Contact Us) or your RAD Distributor.

3. Interface and Settings

> **CAUTION!**
> *The B-RAD X must be calibrated before first use. If the LED Display shows anything other than the Torque Select screen, the Information Menu, or the Calibration Menu, contact Radial Torque Tools B.V. Technical Support (refer to Section 6. Contact Us) or your RAD Distributor.*

3.1. Access Levels

Access to the functions on the B-RAD X Tool System has been restricted to four Access Levels: the Locked Level, the Basic Level, the Advanced Level, and the Distributor Level. Access to the higher levels requires an Access code. Each level has access to different functions. Table 3.1-1 outlines the functions accessible in each level.

Function	Level 🔒	B	A	D
Enter Access Level Code	✅	✅	✅	✅
View Tool Information	❌	✅	✅	✅
Change Set Torque	❌	✅	✅	✅
Change Torque Units	❌	❌	✅	✅
Change LED Brightness Level	❌	❌	✅	✅
Change Two-Hand Modes	❌	❌	✅	✅
Change Back-Off Angle	❌	❌	✅	✅
Tool Calibration	❌	❌	✅	✅
Change Audio Settings	❌	❌	✅	✅
View Tool Statistics	❌	❌	✅	✅
Extended Tool Calibration	❌	❌	❌	✅
Extended Tool Statistics	❌	❌	❌	✅

Table 3.1-1: Access Levels and Functions

3.1.1. Unlocking Access Levels

The B-RAD X has several different access levels. Table 3.1.1-1 below defines the names of access levels, their use cases, and corresponding codes.

To change access levels:

1. Long press Enter to bring up the Main menu.
2. Use ➕/➖ to navigate to the Lock menu option, press Enter.
3. Input the desired Access code from the chart below.
4. Press Enter to accept the new unlock level or press Back to cancel the entry.

Note: If entering new calibration values is a requirement, then contact Radial Torque Tools B.V. Customer Support.

🔑	Access Level	Description and Allowed Menus	Access Codes
0	**Lock**	The user cannot change the torque setting. Only FWD/REV and Lock Menu are active.	➖➕➕➖
1	**Basic**	Change Torque value, FWD/REV, View Menu Tool Info, Lock Menu.	➖➖➕➕➖➖
2	**Advanced**	Basic functionality as well as: View and Change Menu Tool Settings, Tool Calibration	➖➕➕➖➕➖
3	**Distributer**	Advanced functionality as well as: Extended Calibration, Extended Tool Statistics.	Contact RAD distributor.

Table 3.1.1-1: Access Levels

3.2. Using the Interface

This section covers the various ways to interact with the interface.

3.2.1. Changing the Target Torque

Ensure you are on the Main Screen (the torque setting is displayed).
To change the torque value:

1. Press and hold (long press) either of the ➕/➖ buttons until a digit starts blinking. The ➖ (minus) button starts the left-most digit blinking. If you press and hold the ➖ button again, the selected digit moves to the right. The opposite happens with the ➕ (plus) button.
2. Press the ➕ or ➖ button quickly to change the digits by one unit at a time. Other digits may be selected (see Step 1) to fine-tune the torque setting.
3. Press the **Enter** button to save the selected torque value once it is set to the desired value. The torque value will be saved even when the battery is removed.

Note: A long press is 3-5 seconds.

3.2.2. Toggling Forward and Reverse

To change the Rotational Direction the tool is running in between forward and reverse you must be on the Main Screen or one of the menus where torque operation is enabled.

Toggling between Forward/Reverse:

• Long press the Back button until the Forward/Reverse indicator LED changes.

Note: A long press is 3-5 seconds.

3.2.3. Menu Navigation

To enter some menus, an Access Code is required. Refer to Section 3.1 – Access Levels.

• To enter the Menu from the Main Screen: long press **Enter.**
• Navigate through the Menu using the ➕/➖ buttons.
• To select the currently displayed menu item: short press **Enter.**
• To move up one level in the Menu: double short press **Back.**
• To exit the Menu: double short press **Back.**

Note: A long press is 3-5 seconds.

3.3. Basic Level Menu Options

The Basic Level Menu Options are limited to the Lock Menu and the Information Menu.

3.3.1. Information Menu

The Information menu displays values for Gearbox, Torque Units, Low End, High End, Serial Number and Firmware Version.

To review Information:
1. Long press Enter until the display changes from displaying torque value to "inFo". This is the start of the menu system.
2. Short press **Enter** to view the Information Menu.
3. Use the ✚/ ━ buttons to navigate to the desired information item and press the Enter button.
4. The selected information will display and scroll across the LED Display.

Note: When the user is in the info menu, the Trigger is disabled.

To return to the Main Menu, press **Back** twice. Press **Back** twice again to exit the menu system and return to the Main Screen.

Note: For a visual representation of the menu layout and how to get here see Section 3.6 Menu Tree – Overview.

3.4. Advanced Level Menu Options

The Advanced Level Menu Options are limited to the Basic Level Menu options (see Section 3.3) as well as the Configuration Menu options, and the Statistics Menu.

3.4.1. Configuration Menu

The B-RAD X's configuration menu contains all the values that define how the tool behaves during a Torque Cycle. Values that can be set from the Configuration menu include **Units, Display Brightness, 2-Handed Safety Settings, Back-off settings, Calibration Settings,** and **Audio Indication settings.**

To navigate to the configuration menu:
1. Long press the **Enter** button to bring up the Main Menu.
2. Use the ✚/ ━ buttons to navigate to "conFG", press **Enter**.

Note: For a visual representation of the menu layout and how to get here see Section 3.6 Menu Tree – Overview.

3.4.2. Change Torque Units

See Section 3.4.1 Configuration Menu to navigate to the sub-menu this option is located in.

The Units menu is used to toggle between ft·lb (foot-pounds) and N·m (newton-meters).

To change torque units:
1. Use the ✚/ ━ buttons to navigate to the Units menu.
2. Use the ✚/ ━ buttons to toggle between ft·lb (foot-pounds) and N·m (newton-meters).
3. Press Enter to save a selection. Notice that the LED Display has changed to reflect the unit selection.

Note: For a visual representation of the menu layout and how to get here see Section 3.6 Menu Tree – Overview.

3.4.3. LED Display Brightness

See Section 3.4.1 Configuration Menu to navigate to the sub-menu this option is located in.

The Brightness menu is used to adjust the brightness level of the LED Display.

To change the brightness level of the LED Display:

1. Use the ✚/ ▬ buttons to navigate to Brightness and press **Enter.**
2. Use the ✚/ ▬ buttons to select desired LED Display Brightness level.
3. Press **Enter** to save the selection.

Note: For a visual representation of the menu layout and how to get here see Section 3.6 Menu Tree – Overview.

3.4.4. The 2-Hand Safety Setting

See Section 3.4.1 Configuration Menu to navigate to the sub-menu this option is located in.

The 2-Hand menu is used to set the safety setting for how both hands should interact with the tool during a cycle. Enabling it greatly reduces the chance that a hand gets pinched by the reaction arm.

Settings available:
- **"Off":** 2-Hand setting is disabled and only the trigger needs to be pressed to initiate torquing by the tool.
- **"Start":** while the trigger is pressed, the cancel or down button must be pressed once to initiate torquing by the tool.
- **"oPrtn":** while the trigger is pressed, the back or down button must be pressed during the entire cycle to keep the tool torquing.

To change the 2-Hand setting:

1. Use the ✚/ ▬ buttons to navigate to 2hand and press **Enter.**
2. Use the ✚/ ▬ buttons to navigate to the desired settings.
3. Press **Enter** to save the selection.

Note: For a visual representation of the menu layout and how to get here see Section 3.6 Menu Tree – Overview.

3.4.5. Back-Off Setting

See Section 3.4.1 Configuration Menu to navigate to the sub-menu this option is located in.
The Back-Off menu is used to set a value in degrees for the tool to reverse rotation after the tool achieves the set torque. The maximum backoff angle is 90 degrees.

To change the Back-Off Setting:
1. Use the ➕/➖ buttons to navigate to Back-Off and press **Enter.**
2. Use the ➕/➖ buttons to set a Back-Off value in degrees.
3. Press **Enter** to save the selection.

Note: For a visual representation of the menu layout and how to get here see Section 3.6 Menu Tree – Overview.

3.4.6. Audio Indication Setting

See Section 3.4.1 Configuration Menu to navigate to the sub-menu this option is located in.
The Audio Indication menu is used to mute the audio indications for button presses, startup, or all sounds.

To change the Audio Indication Settings:
1. Use the ➕/➖ buttons to navigate to Audio and press **Enter**.
2. Use the ➕/➖ buttons to choose from Boot, Mute and Button settings.
   • Boot: choose between Default or None
   • Button: choose between On or Off
   • Mute: choose between turning all the sounds On or Off
3. Press **Enter** to save the selection.

Note: For a visual representation of the menu layout and how to get here see Section 3.6 Menu Tree – Overview.

3.4.7. Statistics Menu

The Statistics Menu contains a record of the number of cycles in certain torque ranges in the tool.

Viewable values:
• **"Total":** The "Total" menu is used to log the total number of cycles by the tool.
• **"00-20", "20-80", "80-99":** view cycle counts in various torque ranges.
   Example: "00-20" logs the number of cycles that occur between 0% and 20% of the maximum torque value.
• **"Over":** view of cycles in the range of the maximum torque for the tool.

To view a cycle count option:
1. Use the ➕/➖ buttons to navigate to the desired menu option value, press Enter.
2. The number that is displayed is the cycle count for that torque range.

Note: For a visual representation of the menu layout and how to get here see Section 3.6 Menu Tree – Overview.

3.5. Display Mode – Torque vs. Table

The B-RAD X Tool System has two different Display Modes that can be toggled between. There is Basic Display Mode known as the Torque Mode and Select Display Mode known as Table Mode.

Note: The B-RAD X Tool System's is by default set to Basic Display Mode (Torque Mode).

Display Modes:

- **Basic Display Mode – Torque Mode (default):** The main screen displays the target torque in the units the tool is set to and each digit of the torque value may be set using the ➕/➖ buttons (see Section 3.2.1 Changing the Target Torque).
- **Select Display Mode – Table Mode:** The main screen displays the target torque as level from 1-50. The level can be changed by using quick presses of the ➕/➖ buttons.

To calculate the approximate torque value at a desired level use the following formula:

Value at desired Level Number = (Number – 1) x MAX x 0.018367 + MIN

	Description	Toggle Code
Display Mode Toggle	Toggles between Basic Display Mode (Torque Mode), which is default, and Select Display Mode (Table Mode).	➖➖➕➕

Table 3.5-1: Display Mode Toggle Code

3.6. Menu Tree - Overview

Table 3.6-1 is an overview of the Menu system that can be seen in Basic and Advanced Access Levels. With help navigating the menus See Section 3.2.3 Menu Navigation.

Note: A bold description means it will take you to the next menu tree level.

🔑	Menu Level 1	Menu Level 2	Menu Level 3	Display	Description	Values (Bold is Default)	Trig.
Basic	inFo			**inFo**	**Display Information Menu**		Off
		Gbox		Gbox	Shows Gearbox Max and Units	Text	Off
		unitS		unitS	Displays Torque Units	Lb-ft / Nm	Off
		LoEnd		LoEnd	Minimum Allowable Torque	Torque	Off
		hiEnd		hiEnd	Maximum Allowable Torque	Torque	Off
		tooL		tooL	Tool ID (Serial #)	Number	Off
		uivEr		uivEr	User Interface Software Version	Numbers	Off
		hcvEr		hcvEr	Hardware Control Software Version	Numbers	Off
Advanced	conFG			**conFG**	**Configuration Menu**		Off
		unitS		unitS	Change Torque Units	Lb-ft / Nm	Off
		brGht		brGht	Change LED Brightness Level	1-5, **5**	Off
		2hAnd		2hAnd	Change Two-Hand Modes	**Off** / Start / Operate	Off
		b-oFF		b-oFF	Change the Back-Off Angle	0-90, **10**	Off
		cALib		**cALib**	**Calibration Menu**		Off
			cE_hi	cE_hi	High Calibration Energy Level	50-100%, **67%**	**On**
			cE_Lo	cE_Lo	Low Calibration Energy Level	0-50%, **8%**	**On**
			cP 01	cP 01	Set Calibration Point 1	Actual Torque	**On**
				...	Set Calibration Point 2-7	Actual Torque	**On**
			cP 08	cP 08	Set Calibration Point 8	Actual Torque	**On**
			SAvE	SAvE	Save Calibration Table		Off
		Audio		**Audio**	**Audio Menu**		Off
			butto	butto	Button Sounds	**On** / Off	Off
			boot	boot	Boot Chime		Off
			mutE	mutE	Mute Entire Tool	On / **Off**	Off
Advanced	StAtS			**StAtS**	**Statistics Menu**		Off
		total		total	Total # of Cycles on this Tool	Number	Off
		00-20		00-20	# of Cycles in 0-20% Range	Number	Off
		20-80		20-80	# of Cycles in 20-80% Range	Number	Off
		80-99		80-99	# of Cycles in 80-99% Range	Number	Off
		ovEr		ovEr	# of Cycles Above 100%	Number	Off
All	LocH			**Lock**	**Enter Access Level Code**	➕/➖ button Combo	Off

Table 3.6-1: Menu Tree

4. General Operating Instructions

> **CAUTION!**
> *Only qualified personnel with training in the safe operation of torque tooling and the B-RAD X should operate this tool. Refer to the Important Safety Notice for more information.*

4.1. Reaction Arm

> **WARNING!**
> *Always keep body parts clear of the Reaction Arm when the B RAD X is in use. Serious injury could occur.*
> **CAUTION!**
> *Ensure that the Reaction Arm has a solid contact point before operating the BRAD X. Improper reaction will void warranty and can cause premature tool failure.*

Please contact Radial Torque Tools B.V. or your local RAD Authorized Distributor for information on custom Reaction Arms.

Installing the Reaction Arm

Slide the Reaction Arm onto the serpentine fitting and secure the Snap Ring to hold the Reaction Arm in place. Couple the socket and square drive together with a dowel pin and secure with a locking ring.
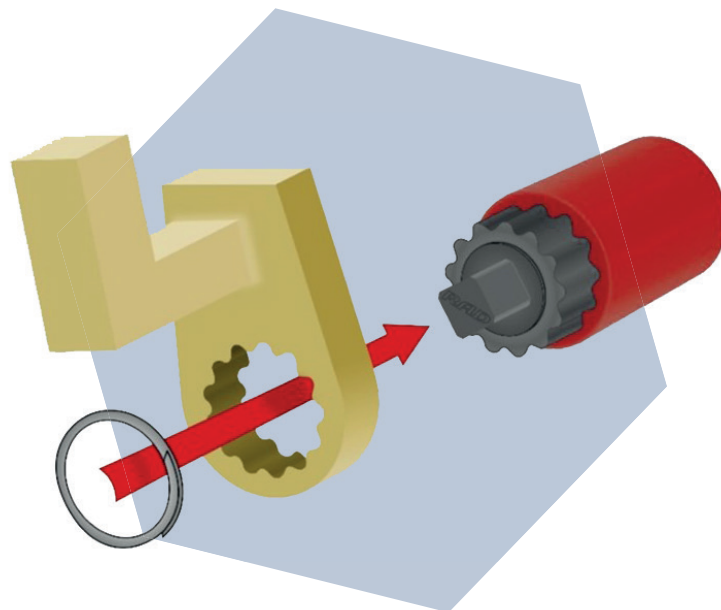
Reaction Points

Make sure that the Reaction Arm is in contact with a solid Reaction Point before you operate the tool. When the tool is in operation, the Reaction Arm rotates in the opposite direction to the Output Square Drive and must be allowed to rest squarely against a solid object or surface adjacent to the bolt to be tightened.

Clockwise Operation   Counter-Clockwise Operation
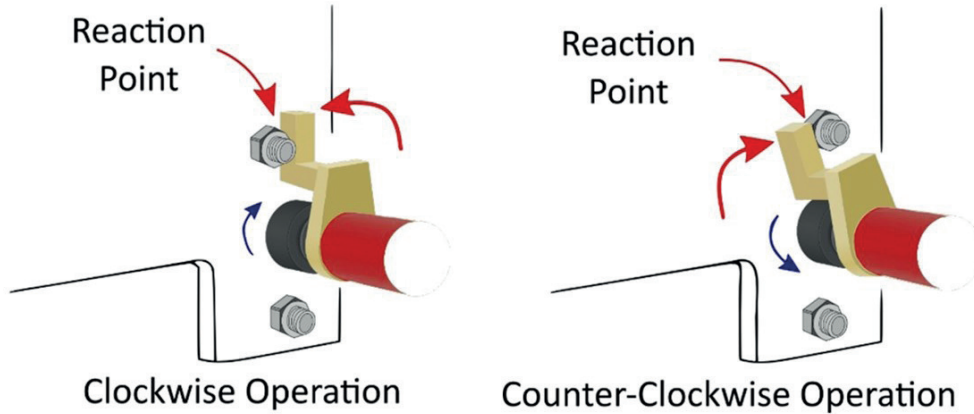
Personal Safety

! CAUTION!
Keep your hands clear of the Reaction Arm and joint when the tool is in operation.

Pinch Point
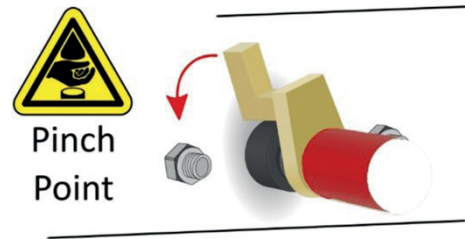
Reaction Arm Height

Ensure that the height of the socket is even with the height of the Reaction Arm.
CORRECT: The Reaction Arm and socket are even.
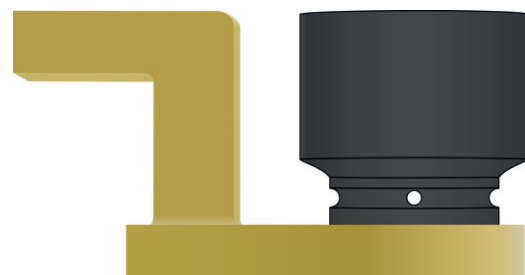
The height of the socket cannot be shorter or longer than the height of the Reaction Arm.
INCORRECT: The leg of the Reaction Arm is too short in the left image and too long in the right image.

Reaction Arm Foot

Ensure that the foot of the Reaction Arm aligns with the reaction point.

CORRECT: The foot of the Reaction Arm aligns with the reaction point.
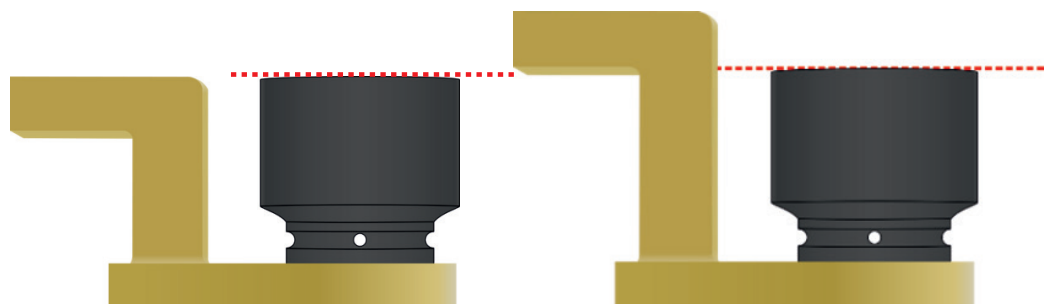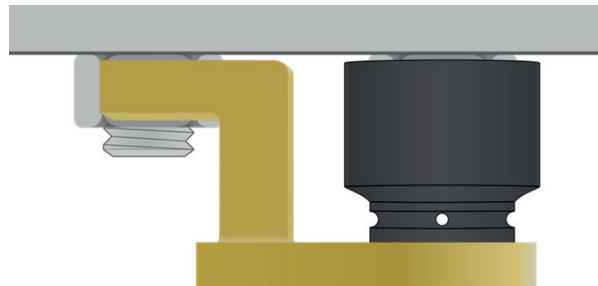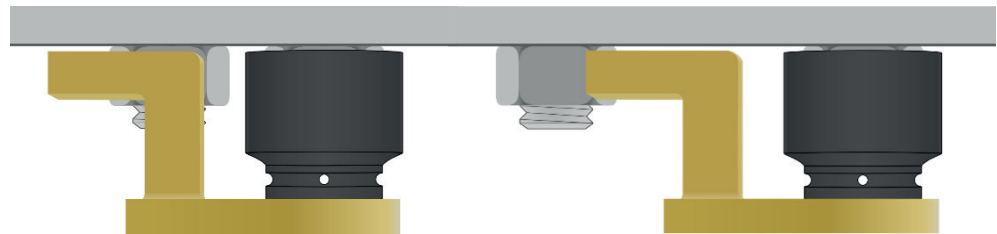

The length of the foot cannot be shorter or longer than the reaction point.

INCORRECT: The reaction point is too close in the left image and too far in the right image. Do not react against the heel of the reaction arm.

4.2. Torque Operation

To operate the tool in a Torque Cycle:

1. Ensure the tool is on the main screen.
2. Ensure the LED Display is showing the correct units.
3. Change the torque value as needed (see Section 3.2.1 Changing the Target Torque).
4. The B-RAD X is ready to torque at the displayed setting.
5. Place the B-RAD X on the joint system and ensure the LED display indicates forward rotation.
6. Press and hold the trigger.
7. To stop the Torque Cycle, release the trigger at any point in the cycle.
8. When the B-RAD X reaches the Target Torque value, the reaction arm will back-off from the reaction point, and the tool will stop turning. Release the Trigger.

5. Troubleshooting

> ⚠️ **CAUTION!**
> *Disassembling or attempting repair will void warranty.*

If breakdown, malfunction, or error occurs, contact Radial Torque Tools B.V. Technical Support (refer to Section 6. Contact Us).

The Display Module may show abnormal behaviour depending on operating conditions, frequency of use, or excessive wear on the Display Module.

The Display Module is designed to withstand normal use over the lifetime of the BRAD X Tool System; however, as a sensitive electronic device it is susceptible to damage caused by shock, moisture, or excessive force.

5.1. Faults and Errors

5.1.1. Errors

Errors indicate abnormal conditions prior to making a torque cycle. The following is a table that indicates errors the B-RAD X can detect and potential solutions.

Error Display	Meaning	What to do
Lo Batt-0	The Battery plugged in has lower than usual voltage, or if using twin battery adapter, one of the two batteries or both have lower than usual voltage.	The battery may be damaged or extensively drained. Try charging the battery. Replace battery.
B-Hot-1	The battery temp is too high, or if using Twin Battery Adapter, one of both batteries are too hot.	Allow the battery to cool or replace battery with another fresh battery.
T-Hot-2	Motor temperature is too high.	Wait until tool has cooled down. Check if fan intake is blocked.
T-Hot-3	The Board Temperature is too high.	Wait until tool has cooled down. Check if fan intake is blocked.
E-04	Over torque error.	Power cycle tool.
E-05	Over Angle Error.	Power cycle tool.
ChGE Batt-6	Unrecognized Battery.	Replace battery.
Lo Batt-7	Battery is low.	Replace battery.
ChGE Batt-8	The battery is low or too old to continue, if using Twin Battery Adapter, one or both batteries are low or too old to continue.	Replace battery.
ChGE Batt-9	Battery has comms error.	Replace battery.
TCold-11	Motor Temp is too cold.	Warm up tool.
TCold-12	Board Temp is too cold.	Warm up tool.
ChgeBatt-13	Battery is of invalid type.	Replace battery.
Bcold-14	Battery temp is too cold, if Using a Twin Battery Adapter, one of the batteries temps is too cold.	Replace with warmer battery.
E-19	Twin Adapter cannot communicate to one of the batteries.	Replace Batteries.
E-20	If using Twin Battery Adapter, one of the temperature sensors has broken open.	Replace twin adapter.
E-21	The voltage detection is broken on Twin battery adapter.	Replace twin adapter.
E-22	Wrong battery types plugged in at the same time.	Plug in correct battery types.
E-23	Tool can no longer communicate to the twin adapter.	Replace twin adapter.

Table 6.1-1: Errors List

5.1.2 Faults

When you see a fault, it is followed by a number. This indicates a hardware anomaly has occurred and the tool needs to be sent to the nearest repair facility for repairs. Contact Radial Torque Tools B.V. or a RAD distributor, report the fault code and describe the conditions before the fault occurred to determine if the tool needs to be sent for repair.

Report the following information/conditions prior to a fault:

- Tool model, serial number, software versions.
- Torque setting of the tool.
- Battery state of charge.
- Number of torque cycles in a row and length of each torque cycle.

Fault Display	Fault Meaning
FLT1	Idle Over Current.
FLT2	Encoder Fault.
FLT3	Driver Fault.
FLT4	No Current Fault into Motor.
FLT5	UI Board Fault – Invalid Board Detected.
FLT6	Quad Encoder Fault.
FLT7	Motor Stall Fault.
FLT8	Board Temp Sensor Fault.
FLT9	Motor Temp Sensor Fault.
FLT10	Voltage detection Fault.
FLT11	Bridge Comms Fault.
FLT12	Current Sensing Fault.
FLT13	MCU Init Fault.
FLT17	UI Board Comms Fault.
FLT18	MCU/UI Synchronization Fault
FLT19	MOSFET Failure Fault

Table 6.1-2: Faults List

6. Contact

Radial Torque Tools B.V.

Zuidergracht 19
3763 LS Soest
The Netherlands

Phone: +31(0) 35-5882450
Mail: sales@radialtorque.eu
Website: www.radialtorque.eu

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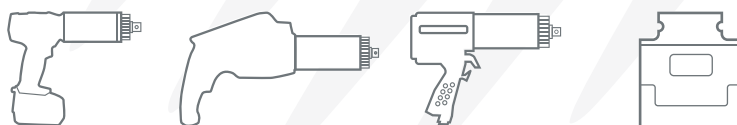
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