RAD TORQUE SYSTEMS

RAD Connect - PRODOCS

User manual

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2. RAD CONNECT/PRODOCS OVERVIEW

The RAD Connect App for Android is an extensive toolset for use with RAD Bluetooth-enabled transducers. The application enables you to view live torque cycles and log results, graph the torque-time curve of the joint, and monitor bolting patterns with the new PRODOCS (Process Documentation) feature.

1.1 App Installation

The RAD Connect App can be installed from the Google Play Store. If a previous version of RAD Connect (earlier than 2.14) is installed on your device, it will be updated to the latest version.

RAD Connect is designed to work with a tablet or a phone in either portrait or landscape orientation.

The installation process will ask you to confirm permission to access device and app history, photos, media, and files, and Bluetooth connection information (Figure 1.1-1). The app will automatically install and the icon will appear on your device's main screen.

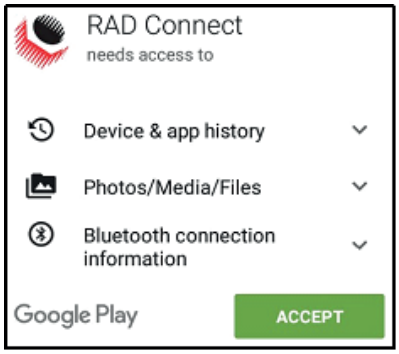

Figure 1.1-1: Permissions Required

1.2 Application Layout

RAD Connect has a simple layout that provides universal access to important functions as well as context- sensitive options.

The default view (Figure 1.2-1) has options for connecting a RAD device to the RAD Connect app (see Section 2.0 – Connecting to a Device).

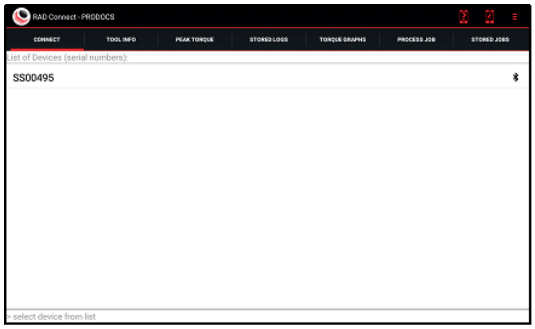

Figure 1.2-1: Default Display (Connect Tab)

CAUTION! RAD Connect keeps both the Android device and the RAD device awake when in the Peak Torque, Torque Graphs, and Process Jobs tabs in order to maintain the Bluetooth connection. This may drain the batteries of both devices. Take notice of the battery levels of your devices and charge them when necessary.

Navigation between tabs may be done by either selecting the tab title or swiping the screen left or right. Options and settings may be accessed through the context menu, which is opened by pressing the menu icon (Figure 1.2-2).

Figure 1.2-2: Menu Button

The two icons next to that (Figure 1.2-3) can be used to conveniently check the Bluetooth connection or reconnect to the RAD device (see Section 3.0 – Connect Tab for more information).

Figure 1.2-3: Accessible Connection Buttons

There are several options in the context menu that stay the same regardless of the tab displayed (see Figure 1.2-4): the connection options, the About screen, and the Quit option.

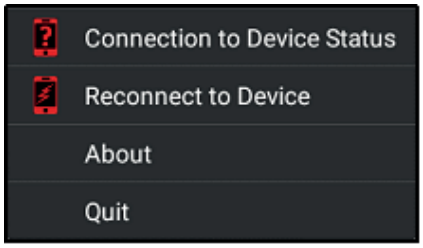

Figure 1.2-4: Menu Options Across All Tabs

"**About**" displays software information and Quick Start Instructions for an overview of the app (Figure 1.2-5).

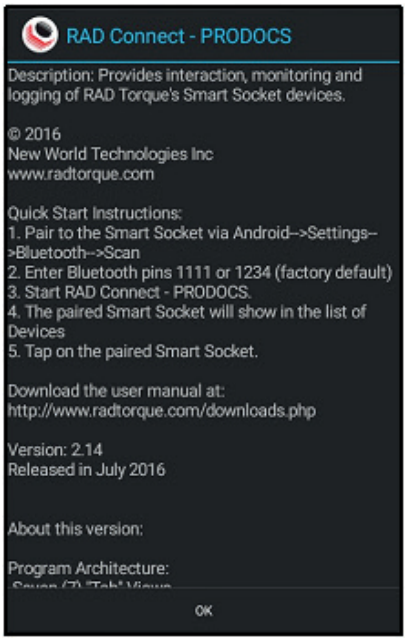

Figure 1.2-5: About Screen

"**Quit**" closes the RAD Connect app. Confirm the dialog to quit (Figure 1.2-6).

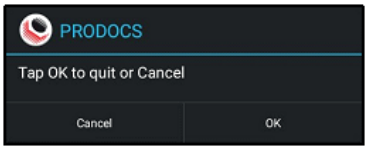

Figure 1.2-6: Quit Confirmation

3. Connecting to a Device

To begin using RAD Connect, tap on the icon. The application will open (Figure 2-1). If Bluetooth is not enabled on your device, the app will ask to turn Bluetooth on (Figure 2-2).

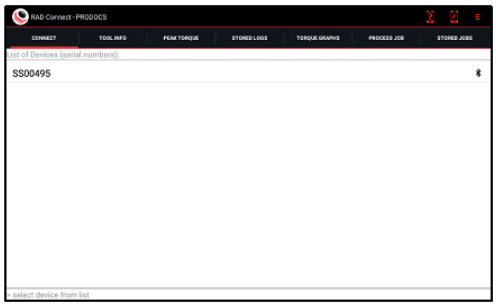

Figure 2-1: RAD Connect Main Screen

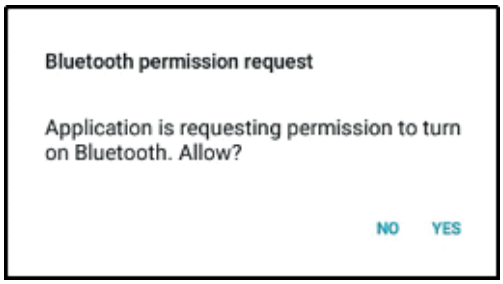

Figure 2-2: Bluetooth Permission Request

The RAD Bluetooth-enabled transducer needs to be paired to the Android device. To pair the devices:

1. Open “Settings” on the Android device (Figure 2-3).
2. Ensure that Bluetooth is enabled.
3. Enable Bluetooth on the RAD device (refer to the appropriate user manual).
4. If the RAD device doesn’t appear in the “Available Devices” list, select “Scan” to refresh the list.
5. Select the name of the desired device. Enter the PIN of the RAD device (default is 1111).
6. The device will be paired and ready to work with the RAD Connect app.

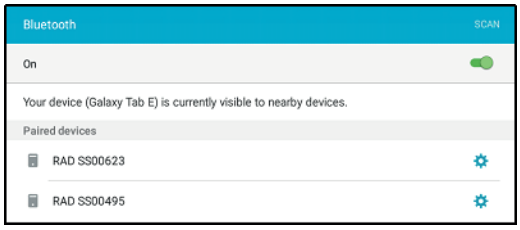

Figure 2-3: Bluetooth settings

Return to the RAD Connect app and select the device from the list (Figure 2-4).

The device will connect and sync any logs and tool information to the RAD Connect app.

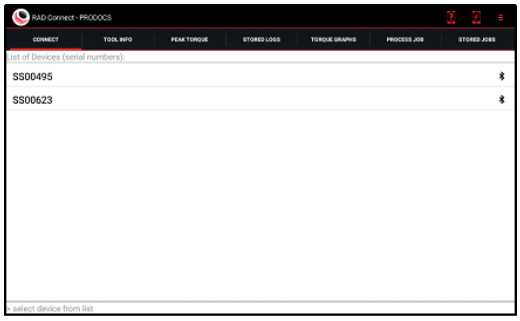

Figure 2-4: Connect Tab

4. CONNECT TAB

The Connect tab (on the far left of the screen) is the tab displayed when the app starts up. There are a number of options available through the menu button in the top-right corner (Figure 3 -1).

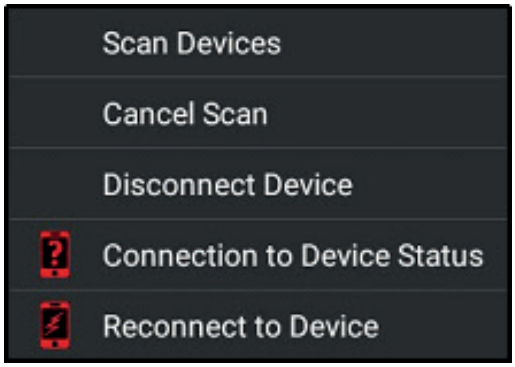

Figure 3-1: Connect Tab Menu

"Scan Devices" refreshes the list of available or paired devices.

"Cancel Scan" stops the polling of devices. Useful if the desired device is already displayed.

"Disconnect Device" terminates the Bluetooth connection.

"Connection to Device Status" displays the current status of the device (Figure 3-2). May also be selected using the icon depicting a device with a question mark on the top bar.

Figure 3-2: Connection Status

"Reconnect to Device" refreshes the connection and displays the connection status (Figure 3-3). May also be selected using the icon depicting a device with a lightning bolt.

Figure 3-3: Reconnecting Device

5. TOOL INFO TAB

The Tool Info tab (Figure 4-1) allows the user to view the details of the tool.

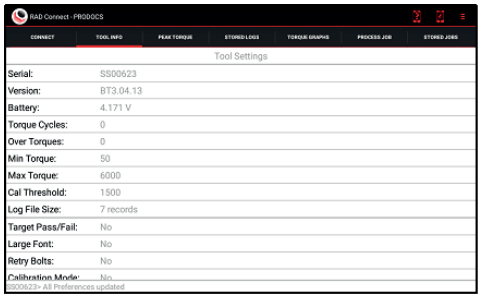

Figure 4-1: Tool Info Tab

These details include:

- Tool serial number
- Software version of the tool.
- Battery voltage of the tool.
- The number of lifetime torque cycles done on the tool.
- The number of overtorques done on the tool.
- The minimum and maximum allowed torque of the tool.
- The Cal Threshold of the tool.
- The number of log records stored on the tool.
- The mode settings of the tool.
- Torque units set on the tool.
- Setpoint and tolerance settings for Pass/Fail mode.
- Uptime settings of the tool.
- Date and Time of the tool.

The Tool Info context menu located in the top-right of the screen (Figure 4-2) is used to modify the tool settings. Each of the options are described below.

Figure 4-2: Tool Info Menu

Tool Mode Preferences (Figure 4-3)
include Target (Pass/Fail) mode, Large Fonts for an easier to read display, Retry Bolt display, Calibration mode, and Real-Time Graphing. These settings can be enabled or disabled by toggling the tick-boxes beside the description. Press Save to apply the selected preferences to the tool or Cancel to leave the tool settings unchanged.

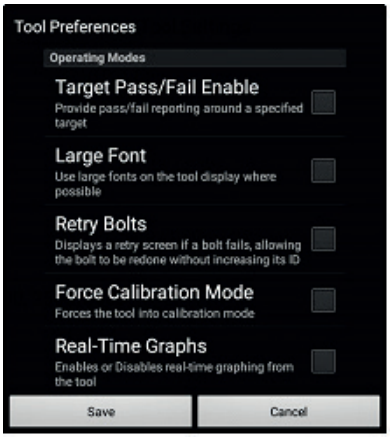

Figure 4-3: Tool Mode Preferences

Tool Units Preferences (Figure 4-4)
is used to change the torque units set on the tool and in RAD Connect. The possible units are Inch-Ounces, Inch-Pounds, Foot-Pounds, or Newton-Metres.

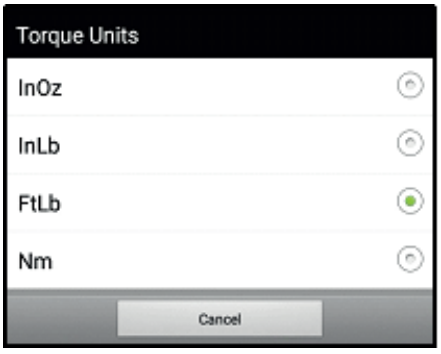

Figure 4-4: Torque Units Preference

Tool Setpoints Preferences (Figure 4-5)
are used to store user-defined torque setpoints that are useful for applications requiring a certain tolerance. The first option, “Target Tolerance,” is the percentage value of allowed deviation from the setpoint. The “Setpoints” option is used to add or modify the list of available setpoints. The values for each Setpoint will stay the same regardless of the units used. To change which Setpoint is currently used, select “Current Setpoint” and choose the desired point from the list. Note: To use the current setpoint on the tool, Target Pass/Fail mode must be turned on.

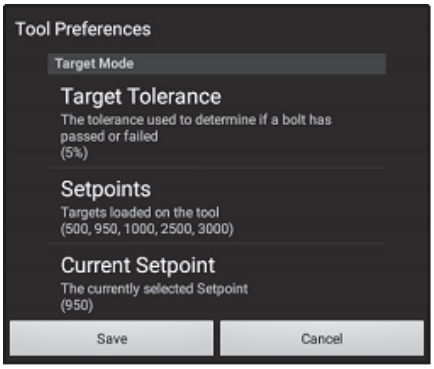

Figure 4-5: Setpoints Preferences

Tool Date and Time Preferences (Figure 4-6)
shows the current Date and Time set on the RAD device. To update the correct date and time based on the Android device time, check the box beside “Set Socket Date- Time.” The time will be updated if you select “Save.”

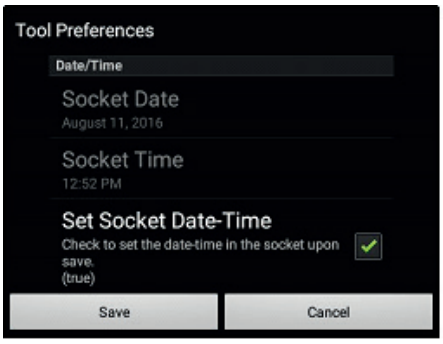

Figure 4-6: Date and Time Preferences

Tool Mode Preferences (Figure 4-3)
include Target (Pass/Fail) mode, Large Fonts for an easier to read display, Retry Bolt display, Calibration mode, and Real-Time Graphing. These settings can be enabled or disabled by toggling the tick-boxes beside the description. Press Save to apply the selected preferences to the tool or Cancel to leave the tool settings unchanged.

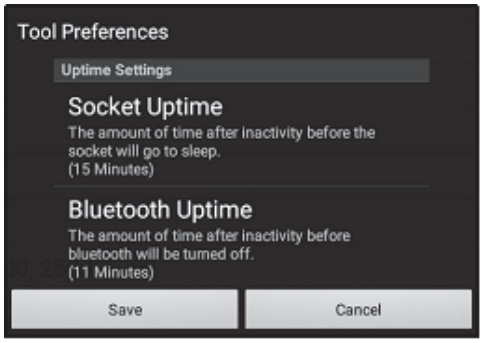

Figure 4-7: Uptime Preferences

Tool Security Preferences (Figure 4-8)
allows you to change the Bluetooth PIN on the Tool. Select the “Bluetooth PIN” box to change the PIN. Enter the desired 4-digit number for the new PIN. The tool may need to be reset after changing the PIN. See the appropriate user manual.

Note: The PIN “0000” is not allowed.

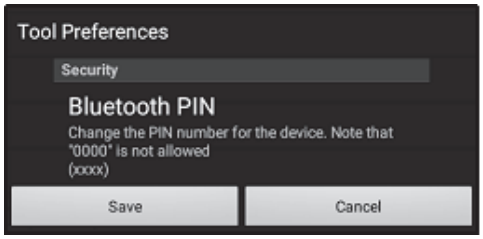

Figure 4-8: Security Preferences

6. PEAK TORQUE TAB

The Peak Torque tab (Figure 5-1) displays the peak torque after a torque cycle is done on the tool.

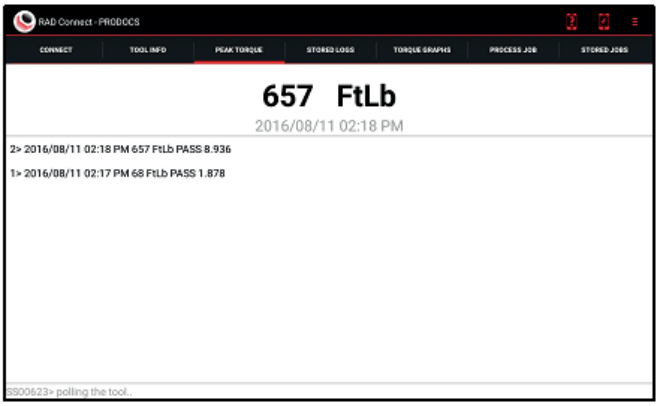

Figure 5-1: Peak Torque Tab

Once the tool registers the torque cycle, the large number at the top will display the actual peak torque. Peak Torque also shows a list of the previous torque cycles in the current log, with the most recent record at the top.

Note: The tool must be in Peak mode to view the Peak torque value. See the appropriate user manual.

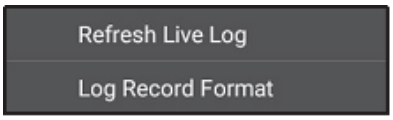

Figure 5-2: Peak Torque Menu

The context menu (Figure 5-2) has two options; one to refresh the log when new pulls have been made that aren't displayed in the log, and the other to view the formatting of the log (see Figure 5-3).

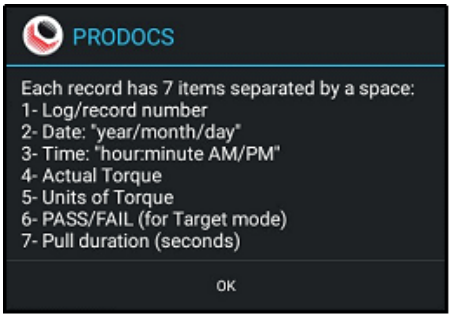

Figure 5-3: Log Record Format

7. STORED LOGS TAB

Stored Logs (Figure 6-1) displays data logs from previous torque cycles done with the RAD device.

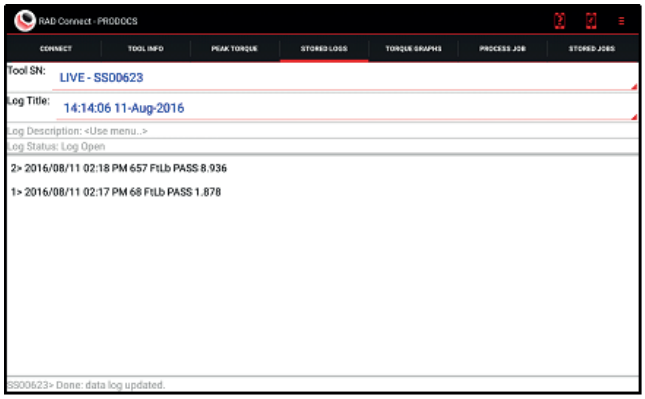

Figure 6-1: Stored Logs Tab

The **"Tool SN"** field can be used to switch between logs from different RAD tools that have been stored in RAD Connect. The selection that says "LIVE" is the currently connected tool.

The **"Log Title"** field can be used to select previous logs from a RAD device that are stored in RAD Connect.

The context menu (Figure 6-2) has several options as described right:

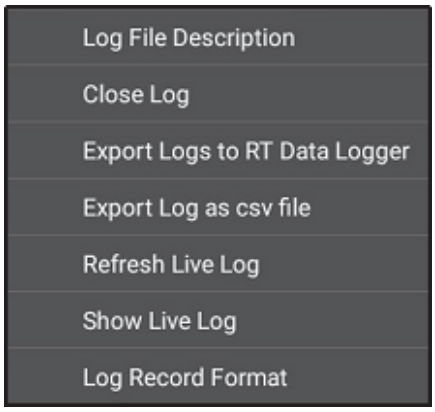

Figure 6-2: Stored Logs Menu

"Log File Description" gives the option to add a brief description of the log contents. Use the backspace button to clear the current description and type in a new short description.

"Close Log" clears the log file from the RAD device and stores it on the RAD Connect app. This is useful when the RAD device is full (usually around 360 log records). To close the selected log, select the option from the menu and confirm the dialog (Figure 6-3).

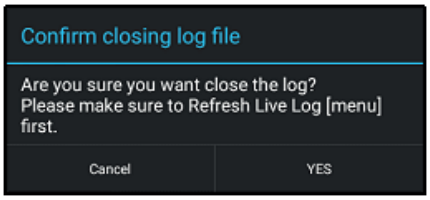

Figure 6-3: Close Log Dialog

"Export Logs to RT Data Logger" is an export option to send logs from RAD Connect to the PC-based RT Data Logger software. Select the option from the menu, and choose whether to export all logs from the selected device or just the current log (see Figure 6-4).

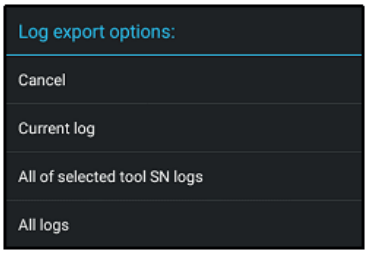

Figure 6-4: Log Export Options

Select the method of exporting or sending the log file (Figure 6-5). The options will vary depending on the apps installed on your device.

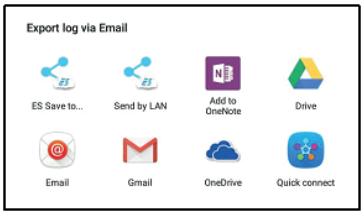

Figure 6-5: Export Methods

To open the exported log file in the RT Data Logger, open the PC software and select File; Import Logs from RAD Connect (Figure 6-6). The log file will import all the information from RAD Connect.

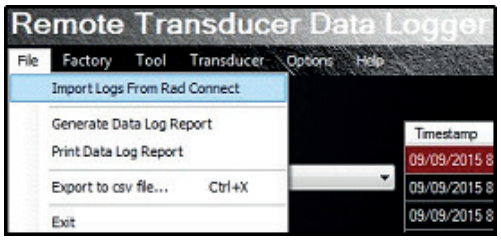

Figure 6-6: Import to RT Data Logger

"Export Log as csv file" is an export option that creates a CSV file that can be used for various data applications. Select the option from the menu, and choose whether to export all logs from the selected device or just the current log. Select the method of exporting or sending the log file. To import the CSV file into a PC application, open the file in aspreadsheet software or use an import function to view the file.

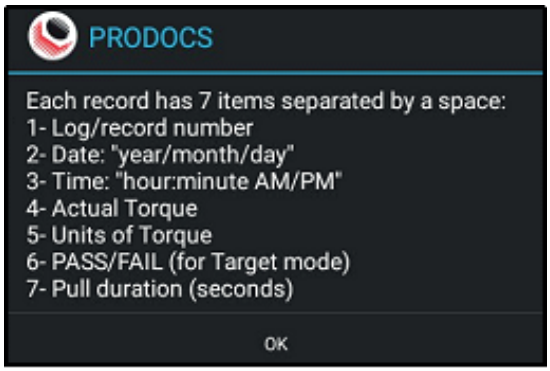

Figure 6-7: Log Record Format

"Refresh Live Log" updates the log file on RAD Connect in case any new records have been made. This is useful before exporting or closing log files.

"Show Live Log" updates the display to show the current log of the RAD device that is connected.

"Log Record Format" helps explain the formatting of the log file (Figure 6-7).

8. TORQUE GRAPHS TAB

The Torque Graphs tab (Figure 7-1) allows you to view a live graph of a torque cycle as it happens.

Figure 6-4: Log Export Options

To view the live graph, wait for the “Graphing is enabled and ready” message to appear. Graphing mode will automatically be enabled on the RAD device when on the Torque Graphs tab. The RAD device is ready to send graphing data. Do a torque cycle. The live graph will appear on the screen.

After a torque cycle is completed and the torque tool has been backed off, the peak torque will be displayed in large text under the torque graph (Figure 7-2).

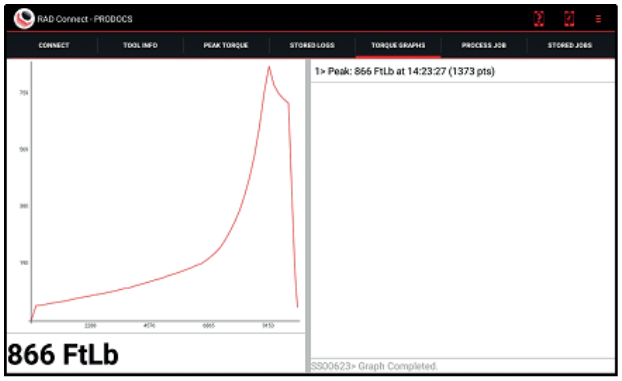

Figure 7-2: Torque Graph and Peak Torque

Each torque graph captured will be temporarily saved and listed to the right of the torque graph window. You may review previous graphs by tapping the description.

There are several options in the context menu (Figure 7-3). They are described right:

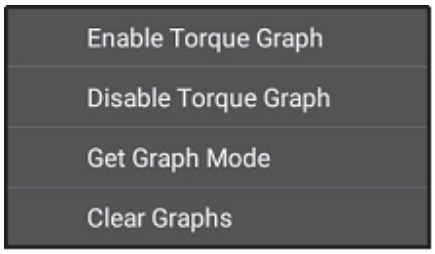

Figure 7-3: Torque Graphs Menu

“Enable Torque Graph” re-enables the live graph.

“Disable Torque Graph” disables the live graph. The RAD device will not produce a torque graph.

“Get Graph Mode” re-enables graphing mode if it was turned off.

“Clear Graphs” will remove the saved graphs from the list to the right of the graphing window.

9. PROCESS JOB TAB (PRODOCS)

The Process Job tab (Figure 8-1), also known as PRODOCS, allows you to create application-specific bolt monitoring programs. PRODOCS will track passed and failed bolts and automatically follow bolting patterns around a basic shape.

The PRODOCS system is based on Pass/Fail of a target torque within a specified tolerance. A number of customizable options help create realistic models for flanges, wheels, and many other applications.

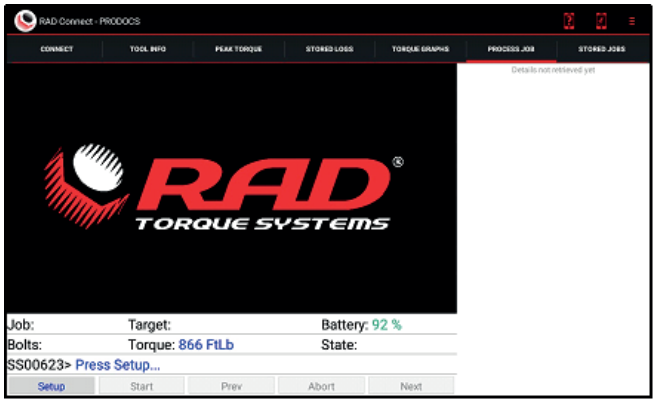

Figure 6-7: Log Record Format

Setting Up a Job
To start using the Process Job tab, select the “Setup” button at the bottom left of the screen. The setup options will be displayed (Figure 8-2).

The **Job Name** may be used later for identification.

The **drawing pattern type** is a rough estimate of the application piece being worked on. Choose a circle for a wheel or a circular piece.

The **Number of Bolts** is the number of fasteners in the application.

Torque Target is the final torque value (in the selected units) that should be reached.

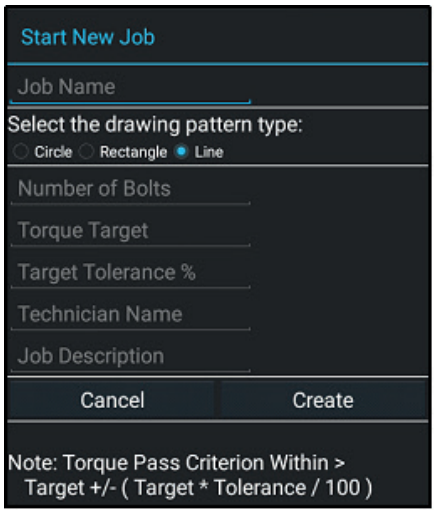

Figure 8-2: Job Setup Options

Starting a Job
After the job has been set up, RAD Connect will ask if you want to assign the starting bolt or start the job with the default configuration (Figure 8-3). To assign a starting bolt, select “Sequence,” then double-tap the bolt that should be the first.

After the starting bolt has been assigned, press “Start” at the bottom of the screen to begin the job. The display is as shown in Figure 8-4.

The job title, target torque value, tolerance, and units, tool battery remaining, bolt selected, torque data status, operation state, and tool status are displayed in the fields below the bolting diagram.

The blue circle highlighted in yellow is the current bolt. PRODOCS will wait for a torque cycle to be completed on the RAD device (note that the strain has to be released before the value will be registered on the transducer).

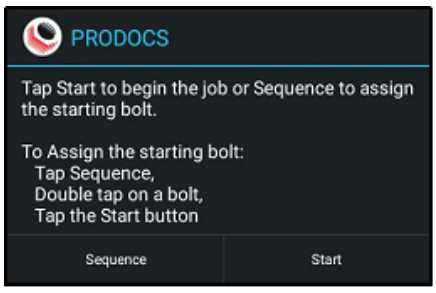

Figure 8-3: Sequence Assignment of Job

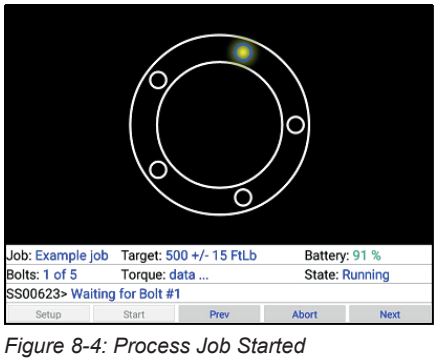

Figure 8-4: Process Job Started

Each torque cycle recorded by the RAD device will be added to the current job. The torque will be classified as a Pass or a Fail, and the status indicated with a check mark or an X (Figure 8-5).

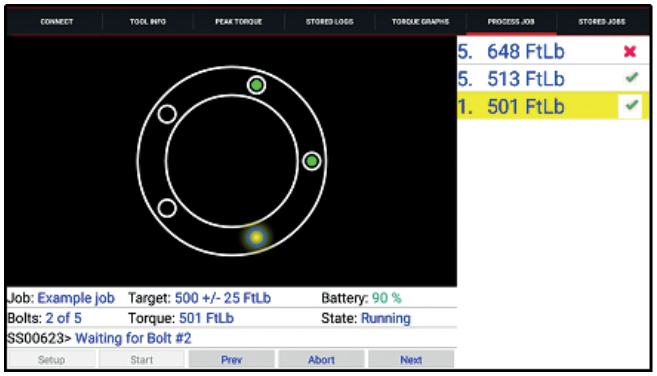

Figure 8-5: Job with Failed and Passed Torques

Green bolts have been successfully torqued, and red bolts have been attempted but the actual torque is outside of the specified tolerance.

When a bolt is successfully torqued, PRODOCS will select the next bolt in line to be torqued. You can select different bolts by double-tapping the desired bolt.

After all bolts have been tightened, a message is displayed stating that the job is completed (Figure 8-6).

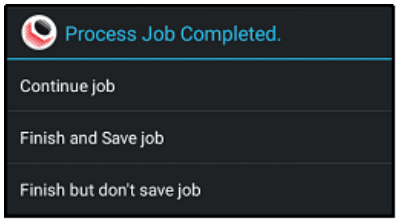

Figure 8-6: Job Completed Message

The **"Continue job"** option leaves the job open to new torque cycles. If you're not happy with the results of some of the bolts, select this option and redo the bolts. When the job is completed, press the "Finish" button at the bottom of the screen.

"Finish and Save job" closes the job and save the records to the Stored Jobs tab (see Section 9.0).

"Finish but don't save job" closes the job and deletes the records. The torque cycles will still be recorded in the Stored Logs tab (see Section 6.0 – Stored Logs Tab).

Process Control Buttons
The buttons on the bottom of the screen (Figure 8-7) control the operation of the job.

Figure 8-7: Process Control Buttons

The **"Setup"** button creates a new job with custom settings (see "Setting Up a Job" in this section).

The **"Start"** button activates the job and allows torque cycles to be made.

The **"Prev"** button will move the selected bolt to the previous position and the "Next" button will move the selection to the next bolt.

The **"Abort"** button will give options to clear the current bolt results, abort the job and discard the results, or abort the job and save the results (see Figure 8-8). The results are saved in the Stored Jobs tab (see Section 9.0 – Stored Jobs Tab).

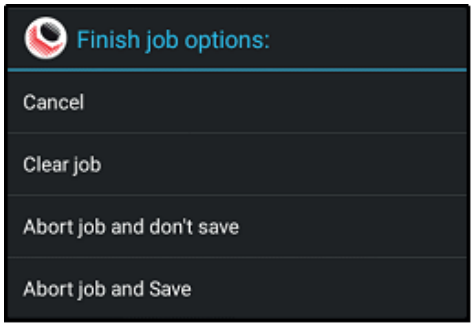

Figure 8-8: Abort Job Options

10. STORED JOBS TAB

The Stored Jobs tab (Figure 9-1) contains records of Process Jobs done using the app. See Section 8.0 – Process Jobs Tab (PRODOCS) for more information.

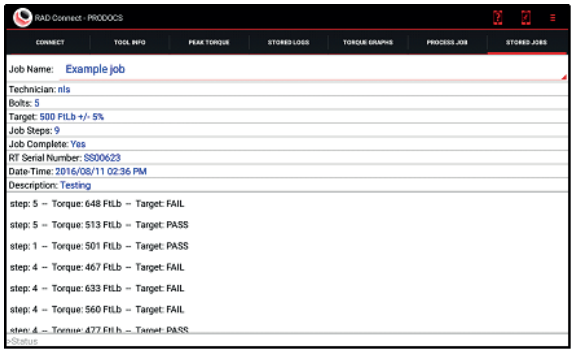

Figure 9-1: Stored Jobs Tab

The Stored Jobs records contain the following information:

"**Job Name:**" the title set during set-up of the Process Job.

"**Technician:**" the name of the operator doing the job.

"**Bolts:**" the number of fasteners set during set-up.

"**Target:**" the Target Torque, units, and percentage tolerance set for the application.

"**Job Steps:**" the number of torque cycles done to complete the job.

"**Job Complete:**" whether the job was successfully completed.

"**RT Serial Number:**" the serial of the RAD tool used to complete the job.

"**Date-Time:**" the date and time the job was completed.

"**Description:**" the description of the job entered during set-up.

The list of steps contains each torque attempt in the order in which they were performed (oldest first). The step number represents the bolt number, with numbers increasing from left to right, or from top clockwise around the shape. The records include the actual torque and the pass/fail status.

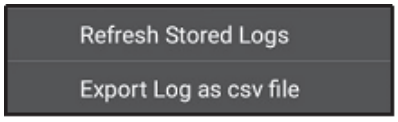

Figure 9-2: Stored Jobs Menu

The job record may be exported as a CSV file and sent via email from your device. Open the context menu (Figure 9-2) and select "Export Log as csv file." Select the method of exporting (Figure 9-3).

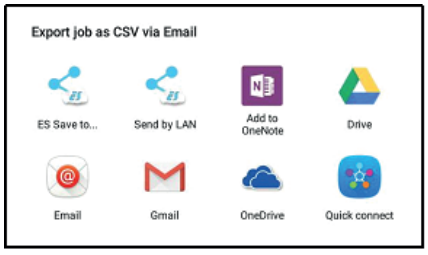

Figure 9-3: Export Job Options

The CSV file may be opened with a spreadsheet software for further manipulation and data retrieval.

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