

VEX™ MOBILE

USER GUIDE

July 21, 2020

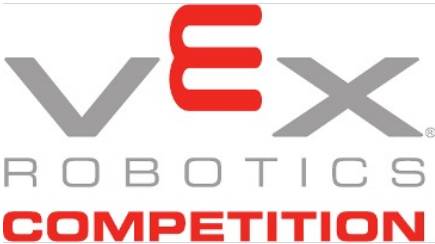


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1. Introduction

VEX TM Mobile is an Android app that interfaces with the VEX Tournament Manager software package. The following interfaces are provided to the user via handheld Android devices:

- Match Scoring
- Skills Scoring

The main benefits of this system include:

- Scores don't need to be physically handed to the scorekeeper
- Scorekeeper doesn't have to read the referee's handwriting
- Invalid score items are flagged as soon as they are entered, allowing the referee to correct the score before signaling for field reset
- Removes the dependency on paper scoresheets
- Head ref can recall historical match data to answer scoring questions

This system supports score entry for official VRC, VEX IQ and VEX U games and skills challenges

1.1 Hardware Requirements

Network

A **5GHz** WiFi router or access point is required to network the **VEX TM Mobile** app to the Tournament Manager software.

Important Note!

VEX TM Mobile will work on 2.4GHz networks, however, there is a possibility that it may interfere with the VEXnet system. 2.4GHz networks should **never** be used for this system.

Device

One or more Android devices meeting the following specifications

- Running a minimum Android version of 4.1 (Jellybean)
- Capable of connecting to a 5GHz network
- Able to connect to the Google Play store to download the **VEX TM Mobile** app

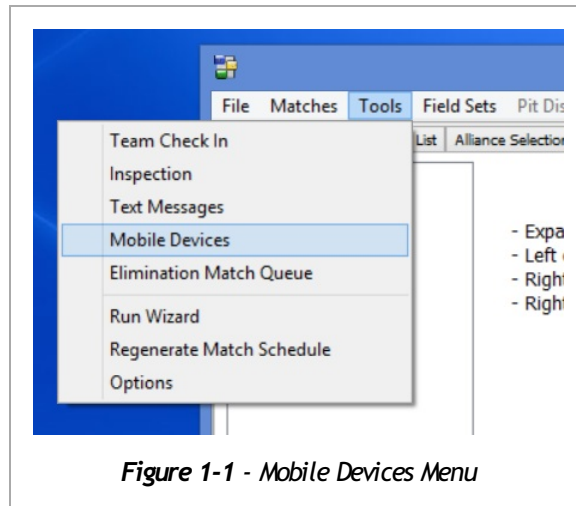
Some examples of devices that meet these criteria are the Google Nexus Tablet series (7, 9, 10) and the Samsung Galaxy Tab series.

Note - The above devices are examples. **VEX TM Mobile** will work on both phone and tablet devices that meet the above requirements

1.2 Software Requirements

Tournament Manager

A version of Tournament Manager that supports Mobile Device Scoring is required. You can tell if your version of Tournament Manager supports this feature by looking for the Mobile Devices option in the Tools menu. (*Fig. 1-1*) If this option isn't seen, you may need to update your Tournament Manager software here: <http://www.dwabtech.com/tm2>



VEX TM Mobile

The **VEX TM Mobile** app needs to be installed from the Google Play store. You can find it by searching for it by name, or directly from <https://goo.gl/LAea6H>

Note - It is very important that you have the latest version of **VEX TM Mobile** installed. Be sure to check for updates prior to starting your event

2. Setup

2.1 Network

VEX TM Mobile uses WiFi to communicate with the Tournament Manager software. While the app takes measures to prevent unauthorized access, it is important to configure the network to be as secure as possible. The specific configuration of the network is not within the scope of this document, however the following network settings are suggested:

- The SSID should not be broadcast
- A security protocol such as WPA2 with a strong password
- Optionally, MAC filtering can help keep unauthorized devices off of the network

Important Note!

The security of the network between the mobile devices and the TM server is of the utmost importance. Make sure that it is set up properly

2.2 Tournament Manager

1. Start the Tournament Manager software as normal and connect to a database.

2. Add mobile devices to the Tournament Manager Database

- 2.1. Open the Mobile Devices dialog via Tools->Mobile Devices
- 2.2. Follow the **VEX TM Mobile** registration process below
- 2.3. When prompted with the two digit code on the device, enter it in the Code field and click Authorize Device
- 2.4. Select the device from the list on the left
- 2.5. Select the role(s) for the device
 - Match Scoring
 - Provides access to score entry for main matches.
 - Skills Scoring
 - Provides access to score entry for programming and skills matches



Figure 2-1 - Web Server Taskbar Icon

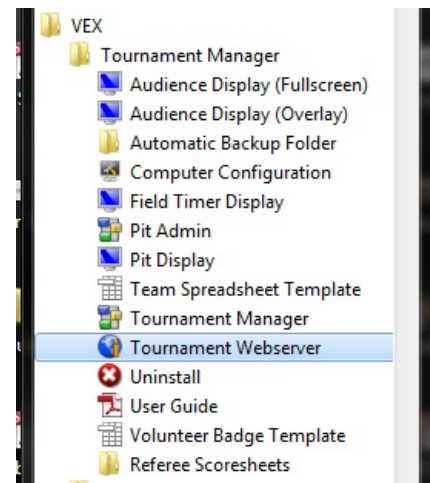


Figure 2-2 - Windows 7 Start Menu

Note - For security purposes, be sure to only assign the roles required for each device.

2.6. Click Save

2.7. Repeat for each device

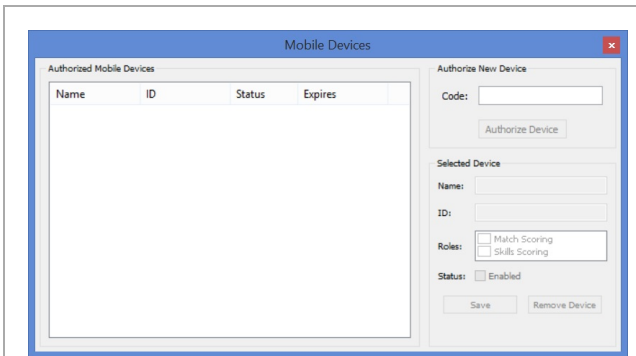


Figure 2-3 - Mobile Devices Dialog - Initial

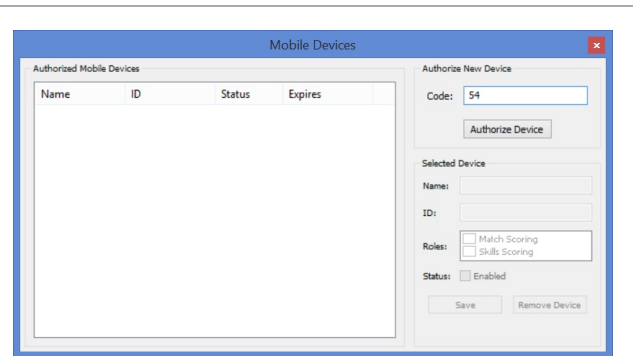


Figure 2-4 - Mobile Devices Dialog - Enter device code

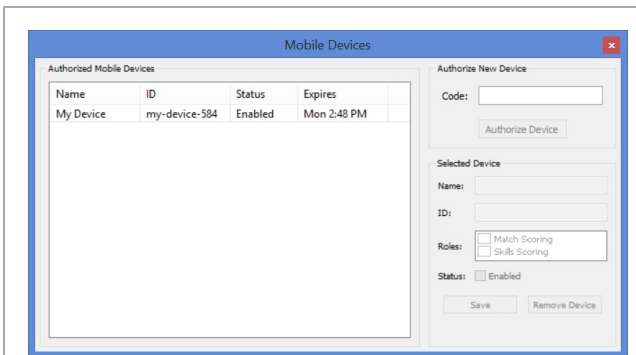


Figure 2-5 - Mobile Devices Dialog - Device activated

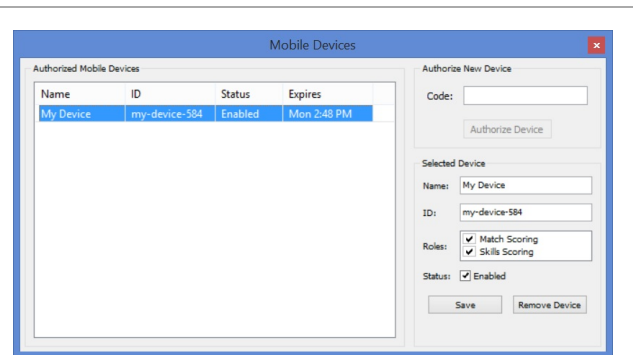


Figure 2-6 - Mobile Devices Dialog - Edit device information

2.3 VEX TM Mobile

1. Enter the device name and the IP address of the server

Tip - The Server IP address is shown under Authorize New Device in Tournament Manager. You can also get the Tournament Server IP Address by right clicking on the server icon in the system tray and selecting "Get Server IP Address".

2. Click the continue button (right arrow)
3. You will be presented with a two digit code. Enter this number in TM as described above.
 - The code will be valid for two minutes. After that time, a new code will be generated
 - If you would like to change the device name or IP, you can click the reconfigure button (left arrow)
4. When the code is correctly entered into TM, the app will automatically continue to the main interface

Note - VEX TM Mobile will determine which game is being played and will automatically show the proper scoring interface.

5. For events with multiple divisions, the division can be selected from the settings menu.

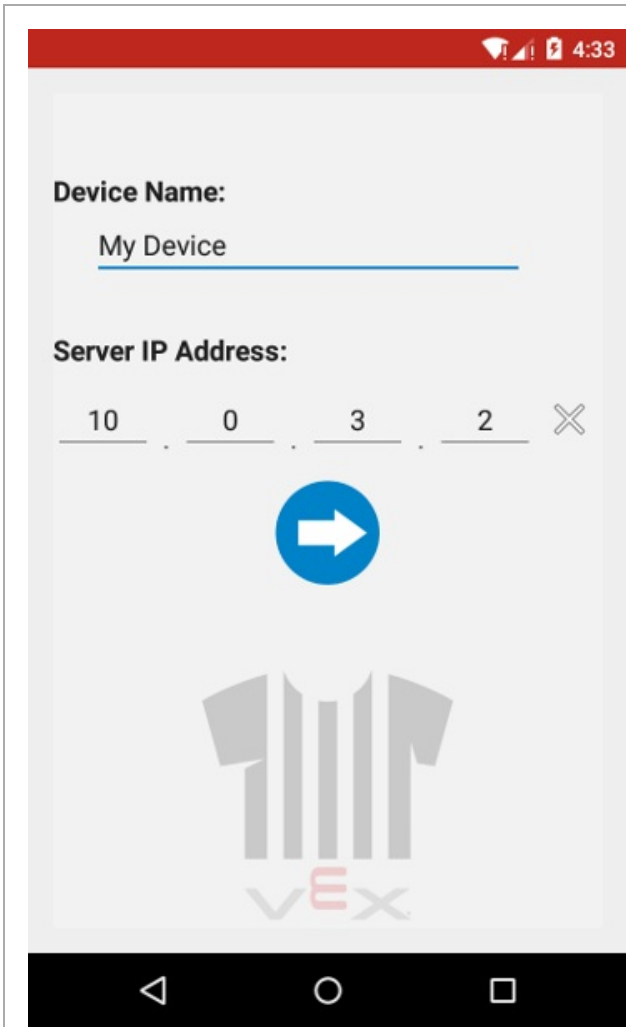


Figure 2-7 - Mobile Devices Dialog - Initial

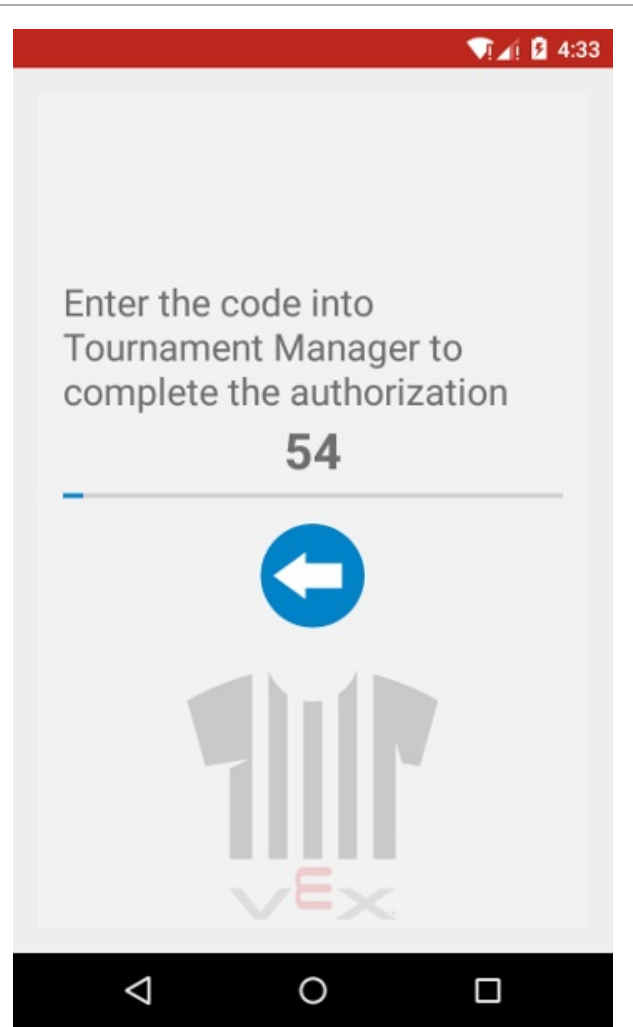
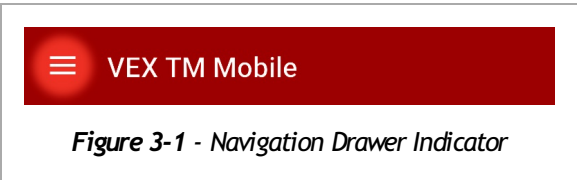


Figure 2-8 - Mobile Devices Dialog - Enter device code

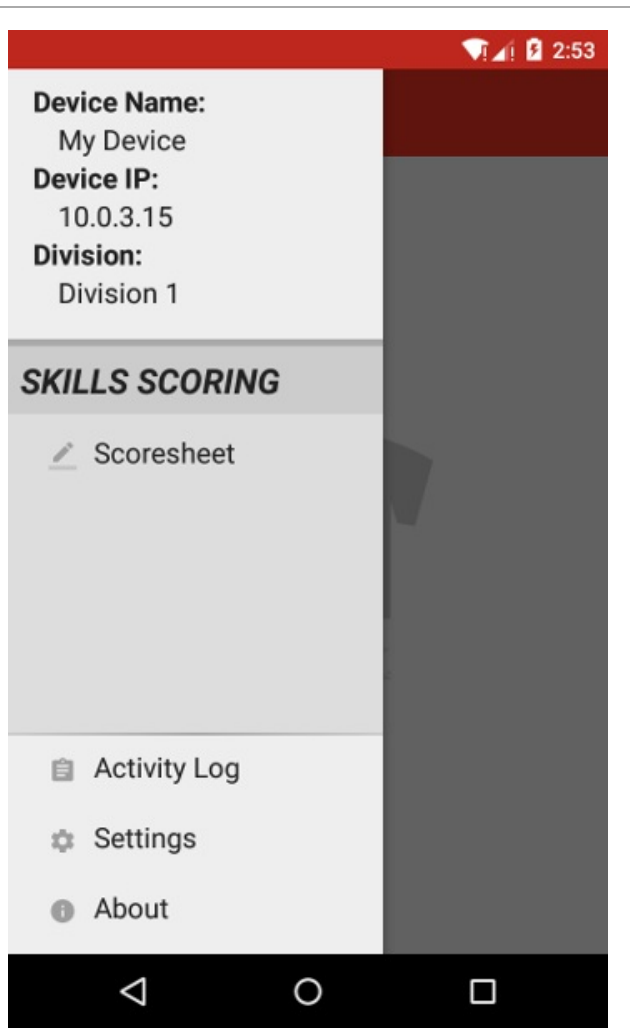
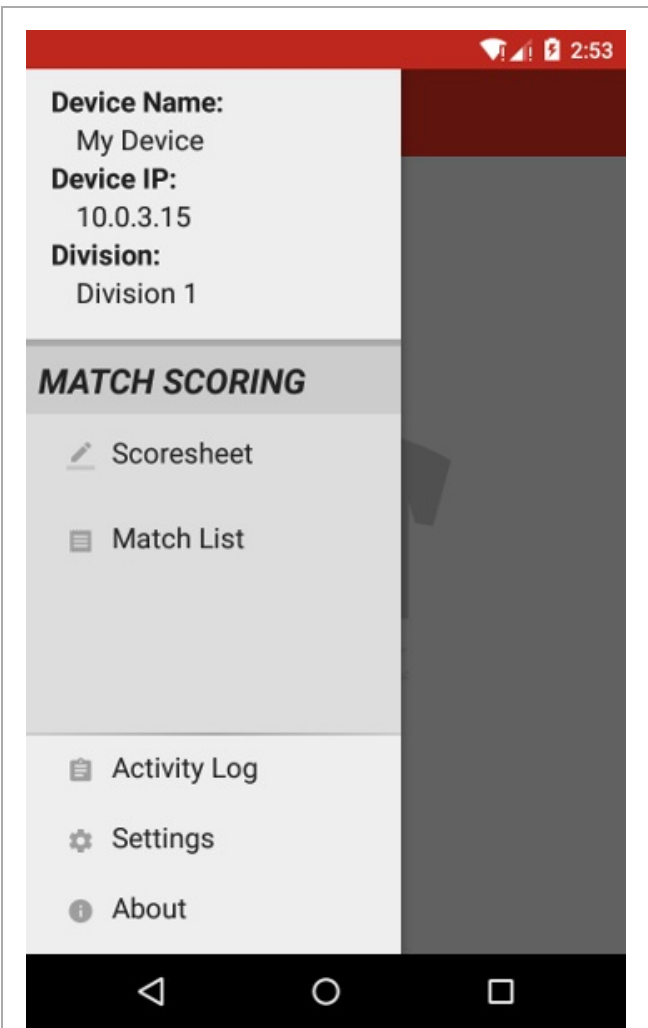
3. App Navigation

The main form of navigation within **VEX TM Mobile** is the navigation drawer. It can be accessed by clicking the indicator in (Fig. 3-1), or dragging it out from the left edge of the screen.

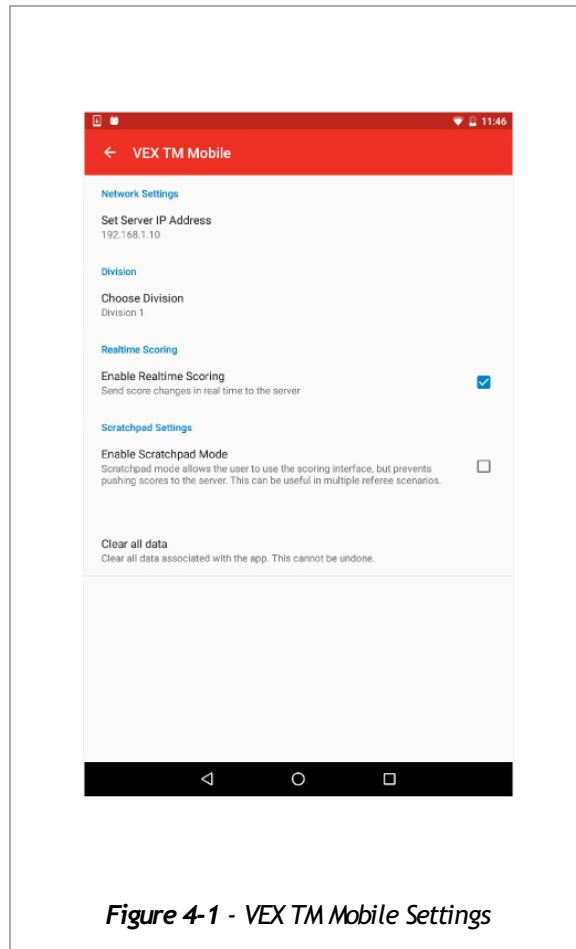
The nav drawer displays the device name and IP, as well as the selected division (for multi-division events). The navigation items are presented according to the assigned role(s) of the device.



Note - If roles are added to or removed from the device while the app is running, the quickest way to update the navigation drawer is to open the Settings window and then go back to the main screen. The update will take place automatically



4. Settings



- Server IP
 - Set the server IP to the IP address of the Tournament Manager server
- Division
 - In a multiple division tournament, this is used to select which division this device is scoring
- Enable Realtime Scoring
 - Turns the realtime scoring functionality on/off
- Scratchpad Mode
 - Scratchpad mode puts **VEX TM Mobile** in state where the user can enter scores via the scoring interface, however, the controls to write to the server are removed. This is useful in situations where there are multiple referees tabulating the score of the same match on different devices before submitting an official score from a device not in scratchpad mode.
- Clear all data
 - This option clears all data and then restarts the app. When the app comes back up, the device will need to be set up again to connect with the Tournament Manager server. This is typically used to reinitialize a device that was previously used at a different event

5. Device Management

All of these procedures are performed in Tournament Manager via the Tools->Mobile Devices dialog

5.1 Device Expiration

Devices will automatically expire after 1 hour of inactivity. When expired, the device will be disabled within Tournament Manager. Follow the Enabling Devices procedure below to reenable any expired devices.

5.2 Removing Devices

From the Mobile Devices dialog, select the device and click Remove Device

5.3 Renaming Devices

1. Select the device in the Mobile Devices Dialog
2. Change the name of the device
3. Click Save

5.4 Disabling Devices

To temporarily disable a scoring device, for example, during a lunch break

1. Within Tournament Manager, open the Mobile Devices dialog via Tools->Mobile Devices
2. Select the device that is to be disabled
3. Uncheck the Enabled checkbox
4. Click Save

5.5 Enabling Devices

1. Within Tournament Manager, open the Mobile Devices dialog via Tools->Mobile Devices
2. Select the device that is to be enabled
3. Check the Enabled checkbox
4. Click Save

6. Role - Match Scoring

6.1 Scoresheet

1. Match List Button
 - Navigate to the match list
2. Match Information
 - This section will show the match number and scheduled time of the currently selected match
3. Match Status
 - This icon will show the current state of the selected match. The state will be one of the following:
 - **Unscored** - The match is available to be scored
 - **Submitted** - The match score has been submitted by **VEX TM Mobile** . It has not yet been made official by the scorekeeper. The **VEX TM Mobile** interface can no longer modify this match, however, changes can still be made by the scorekeeper.
 - **Scored** - The match has been made official by the scorekeeper. The **VEX TM Mobile** interface can no longer modify this match. The scorekeeper can still rescore the match in Tournament Manager
4. Team Status
 - This section shows the teams that are playing in the selected match. It indicates if any of the teams have been marked as No Show or DQ. For games that have elimination match that require a team in the alliance to sit, that will also be indicated in this section.
5. Match Selector Buttons
 - The left button will select the previous match in the round
 - The middle button will select the lowest numbered unscored match
 - The right button will select the next match in the round
6. Scoresheet Entry Mode Toggle Button
 - This button will toggle the scoring interface to a mode that allows the user to increment/decrement the scoring element values. (*Fig. 6.1-3*) This is especially useful if trying to keep track of the match score in real time.

Note - When in increment mode, the score cannot be directly submitted. You will need to toggle back to the main number entry view shown in *Fig. 6.1-1* to access the submit button

7. Scoring Item Entry
 - This section is used to enter values for the scoring elements. Clicking on a scoring element will bring up an entry dialog. (*Fig. 6.1-4*)
 - The arrow buttons will navigate to the previous/next entry score item
 - The reload button will reset the scoring entry to the value that entry dialog opened with
 - The white box around the entry value will turn yellow to indicate that the value has changed
8. Clear Score Button
 - This button will revert the scoresheet to the default state for the game if it is in an unscored state.
9. Reload Score Button
 - This button will reload the match from the server.
10. Submit Score Button
 - This button will submit the scoresheet to the Tournament Manager server. If the match is not in an

unscored state, a dialog will be displayed. This could occur if another device or the scorekeeper has submitted or saved the score for the match. In this situation, the scoresheet will remain visible so that any scoring inconsistencies can be resolved with the scorekeeper.

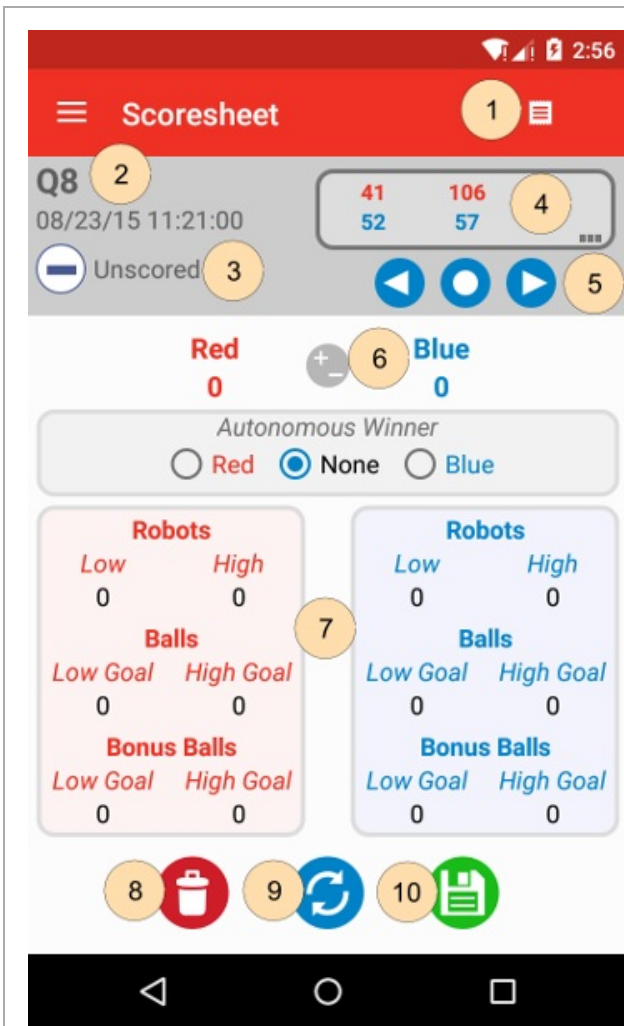


Figure 6.1-1 - Nothing But Net Scoresheet Interface

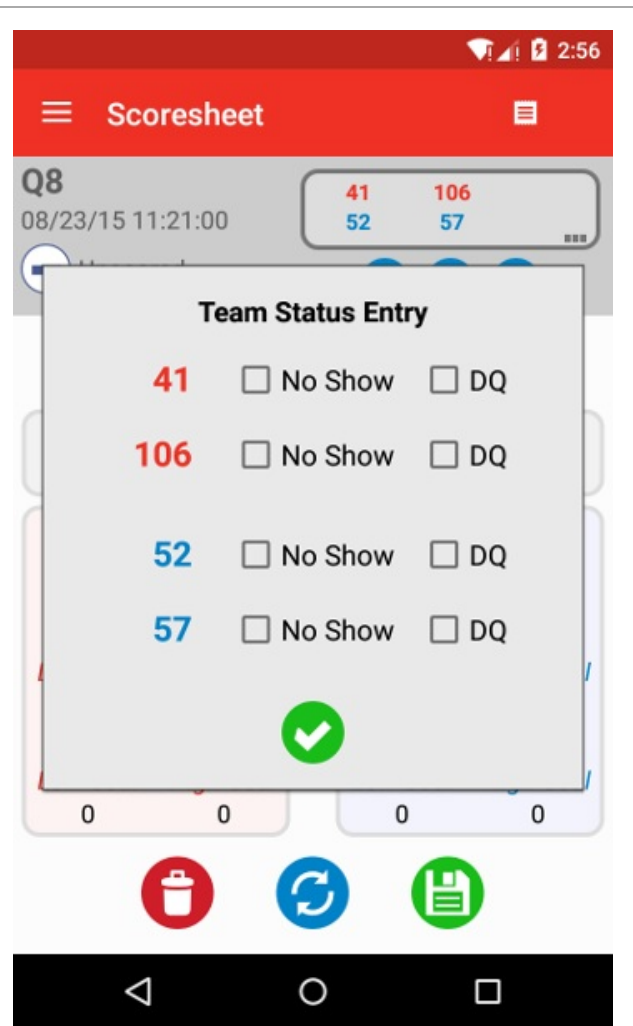


Figure 6.1-2 - Team Status Popup

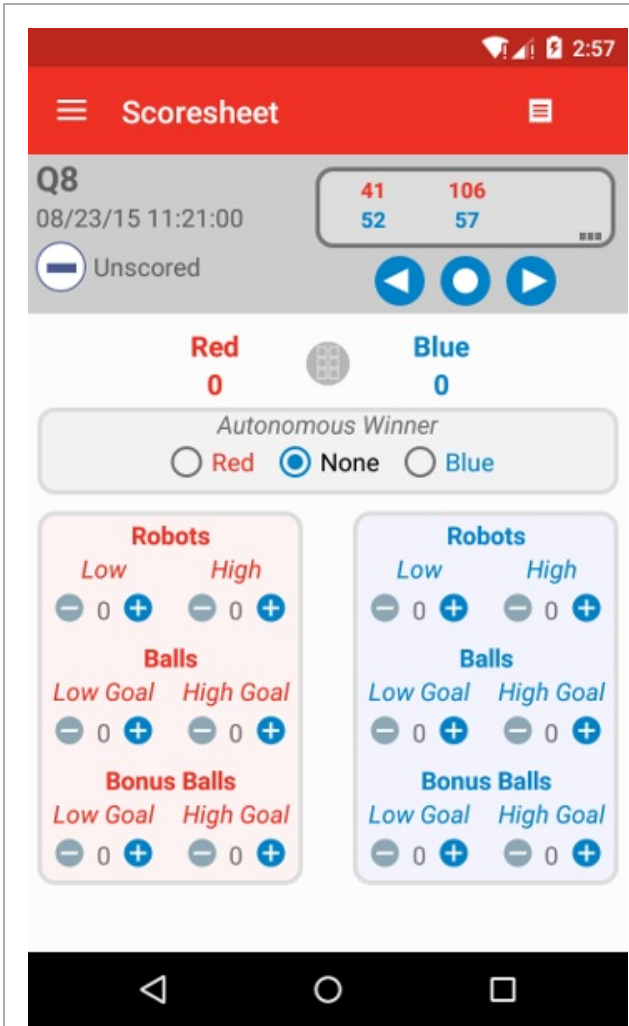


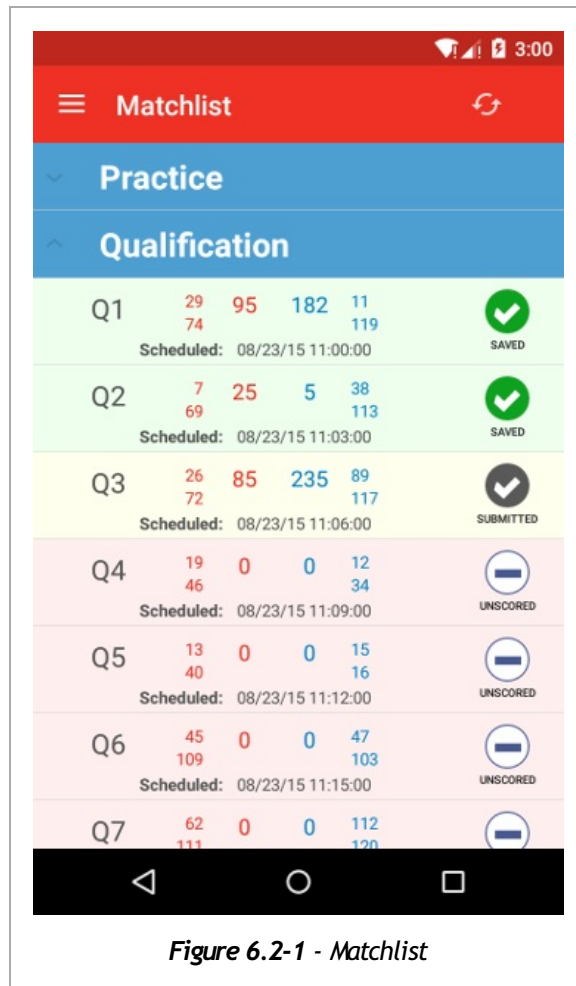
Figure 6.1-3 - Scoresheet Increment Entry View



Figure 6.1-4 - Scoring Item Entry Dialog

6.2 Matchlist

The matchlist screen is accessible from the navigation menu, and presents the user with the matches that have been created by the Tournament Manager software.



- Tapping on a round heading will expand/collapse the round section
- Tapping on a match will open that match in the scoresheet view
- Tapping on the refresh button or pulling the list down when at the top of the list will reload the list from the server

6.3 Scoring Procedures

This section describes the basic procedures used to score matches with **VEX TM Mobile**. These procedures describe all of the main steps needed to score matches, however, they allow for some flexibility to be optimized for different event configurations.

Note - When referring to actions performed by the referee in the procedures below, it is implied that the action is performed via **VEX TM Mobile**. When referring to actions performed by the scorekeeper, it is implied that the action is performed via Tournament Manager

Practice/Qualification Matches

1. The scorekeeper queues up the match to be played
2. The referee navigates to the match being played. This can be done using the navigation buttons or the match list
3. If there are any teams that need to be marked as a No Show, tap the team status entry box, mark the appropriate team(s), and close the dialog
4. The scorekeeper starts the match
5. If the game includes an autonomous period, when the winner is known, the referee selects the winner. This will automatically display the autonomous winner on the In-Match audience display.
6. If desired, the referee can tap the entry mode toggle button to switch to increment mode to keep track of the state of the field in real time

Note - Keeping track of the state of the field in real time is not required, but it can help to speed up the score entry at the end of the match. Real time entry can be performed from the numerical entry view, but it's a little more cumbersome

7. When the match ends, the referee fills in the final scoresheet based on the state of the field, *but does not submit yet*

Tip - For entering the final state of the field, the numerical entry interface can be more efficient than the increment interface, especially for large numbers of scoring objects

8. If there are any teams that need to be marked as DQ, tap the team status entry box, mark the appropriate team, and close the dialog
9. The group of referees should validate that the values entered into the scoresheet are accurate
10. The referee taps the submit button to send the score information to Tournament Manager

Note - Remember that once a match is submitted, it can no longer be edited from **VEX TM Mobile** and any changes will need to be made by the scorekeeper.

Tip - Do not clear the field until you know that the score has been received by the server. This can be determined by looking for the match state to go to Submitted within **VEX TM Mobile**. Additionally, the field queue display will show the match number that was saved.

11. The scorekeeper will see the match changed to the submitted state and should verify that the score entered looks valid. If there are any fields that look like they aren't correct, the referee should be notified for clarification

12. The scorekeeper saves the match to make the score official

Tip - For the saved state to appear on the **VEX TM Mobile** scoresheet, either tap the reload button, or navigate away from the match and navigate back

Elimination/Finals Matches

Scoring elimination matches is very similar to scoring qualification matches with a few small differences.

- Once elimination/finals matches are created by the scorekeeper, the referee will need to go to the matchlist within **VEX TM Mobile** and reload the list. This will retrieve the newly created matches
- Since elimination/finals matches can be played in any order, **VEX TM Mobile** has no concept of previous, next, or current match. Therefore, those buttons are not available for use. This means that all match navigation takes place via the matchlist interface.
- As new matches are generated based on match results, **VEX TM Mobile** will need to retrieve them from the server. Based on the order that the matches are played in, this will happen automatically for most rounds. If the match or round that is needed is not seen, simply reload the match list.

Tip - New elimination matches are created only when the scorekeeper saves the match in Tournament Manager. Therefore, to maximize your chance of loading all newly created matches, after submitting the match, stay on the scoresheet screen until the match score is announced. At that point the new matches will have been created and navigating to the matchlist will retrieve them automatically

- For games that have more alliance members than can play in each match, the referee is responsible for marking them as sitting. This is done in **VEX TM Mobile** with the following procedure
 1. Click on the team status entry box to open the entry dialog (*Fig. 6.3-1*)
 2. Click on the team number for the teams that are sitting

Tip - When the team is marked as sitting, they will be grayed out in the dialog. You can tap another team number to change the sitting team.

Tip - If the team marked for sitting was previously marked as DQ or No Show, that state will be cleared

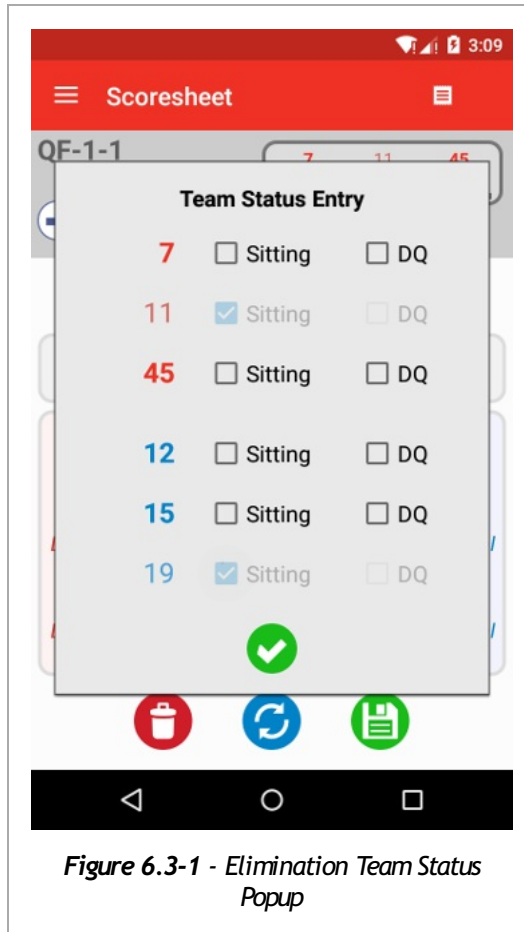


Figure 6.3-1 - Elimination Team Status Popup

6.4 Realtime Scoring

Realtime scoring allows the scoring items to be sent to the Tournament Manager server as they are changed so that they can be displayed on the In-Match display screen. This functionality is enabled by default. It can be disabled in the settings menu of the mobile device. When enabled, there will be an RTS with a green checkmark at the top of the scoresheet header.

When a match is queued, the score boxes will be hidden on the In-Match audience display. When the match is started and the first score change for the match is received by Tournament Manger, the scoring boxes will be shown and will remain visible for the remainder of the match. The scores will update as they are changed throughout the match. When the match ends (either the timer expires or the match is aborted), the score boxes will be hidden. This allows the referees to perform a final count of scoring objects without the score being made public until it is finalized.

Multiple devices can enter realtime scores simultaneously, however there are a few things to keep in mind

- The calculated score will use the last value received for each scoring object. Each ref should be assigned a set of scoring objects (typically by alliance color) and should not modify other objects.
- Scoring changes made on one device will not be seen on other devices.
- Clearing the score using the trash can icon from one device will clear all scoring objects. If this is needed, be sure that all devices click the clear button as well to keep everything in sync

It is suggested that increment mode be used on the scoresheet during the match in order to achieve the frequency of score entry needed for accurate real time scores.

When the match is complete, the final counts for all scoring objects need to be entered into a single device. Once the count is verified, the score can be submitted as normal. Once submitted, all refs can select the next match to score.

Note - Realtime scoring is intended to help audiences understand the current state of the match. It is understood that scores won't be 100% accurate due to the fast paced nature of the game, however it is important to be as accurate as possible to provide the best experience for all participants

7. Role - Skills Scoring

7.1 Team List

1. Team Filter
 - Teams can be filtered by their team number. Simply start typing and the list will filter automatically
2. Team List
 - The team list will show the team number and the number of runs that team has scored for each skills type
3. Reload Button
 - All skills information is retrieved from the server
4. Programming Skills Button
 - This button enables when a team is chosen and transitions to the programming skills score entry screen
5. Robot Skills Button
 - This button enables when a team is chosen and transitions to the robot skills score entry screen

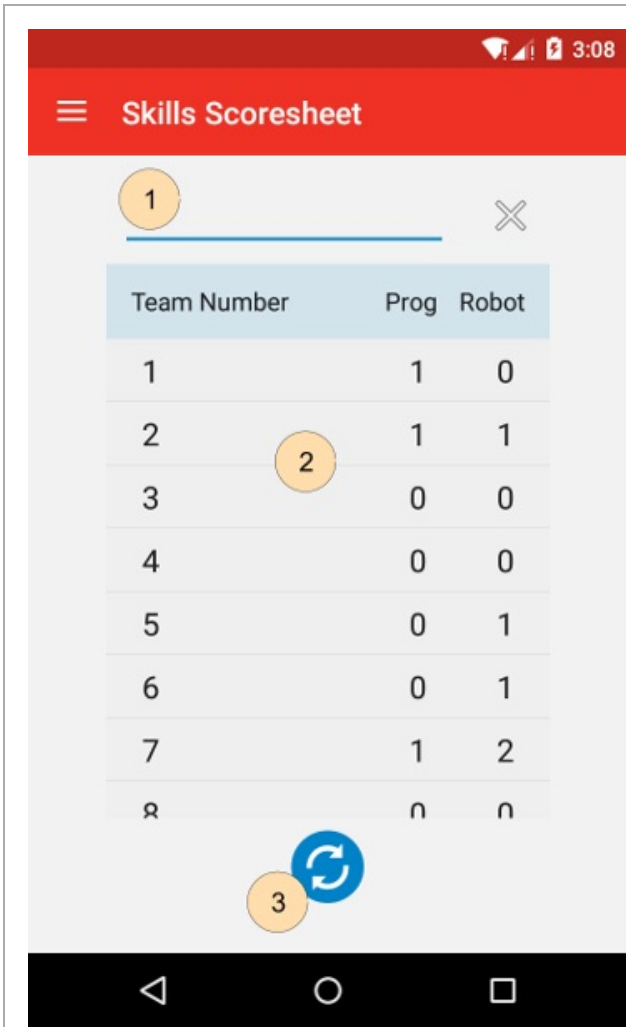


Figure 7.1-1 - Skills Team List

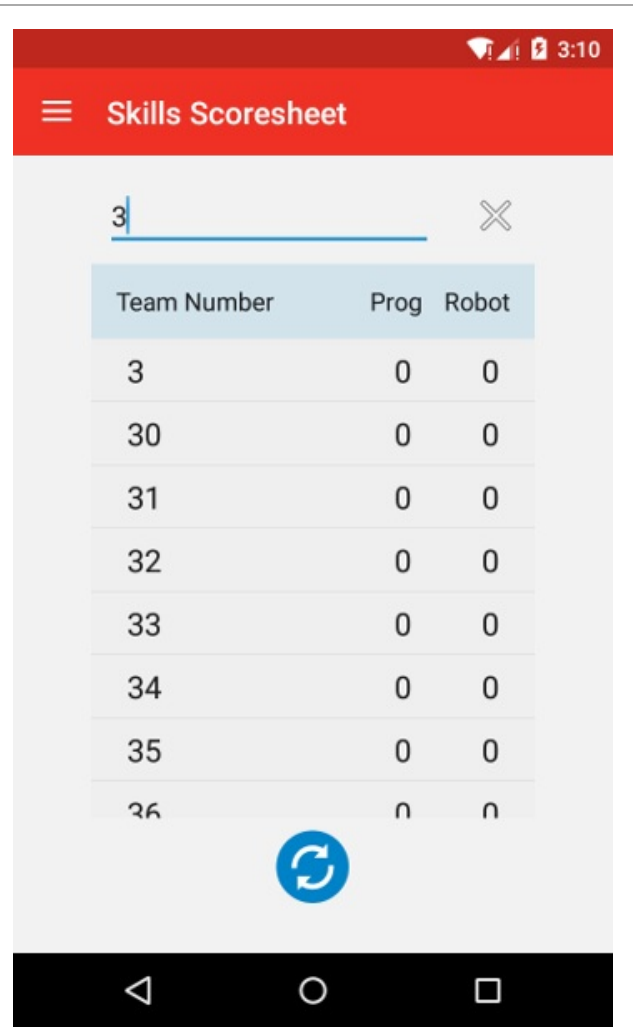


Figure 7.1-2 - Skills Team List - Filtering teams starting with 3

7.2 Score Entry

The score entry is selected automatically for the game being played.

1. Team Number
2. Attempts
 - The number of times the selected team has already attempted each skill type.
3. Skills Type Selector
4. Entry Fields
5. Discard Button
6. Submit Button

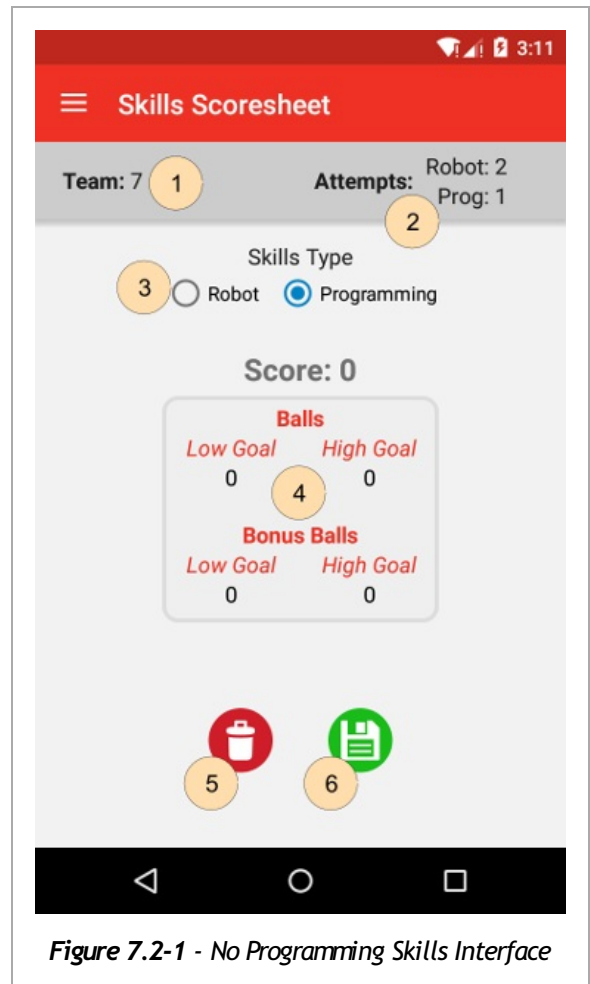


Figure 7.2-1 - No Programming Skills Interface

7.3 Scoring Procedures

1. From the team list, select the team that is playing
2. Select the type of skills match being played.
3. When the run is complete, score the match
4. Verify that the scoring is entered accurately, and that the proper type of skills challenge is selected
5. Tap the submit button
6. Feedback will be displayed to indicate whether that score was received by the server
 - If the server receives the score, *Score submitted* will be displayed.
 - Click the continue button to navigate back to the team list
 - If there is an error communicating with the server, error specific will be displayed.
 - Bring the scoring device to the scorekeeper
 - Verify that the score was not received by the server
 - If the score was not received by the server, manually enter the score into Tournament Manager
 - Once the score is properly entered into Tournament Manager, click the continue button on the tablet

Note - Do not clear the field until the score is submitted and you have verified that the server successfully received the score

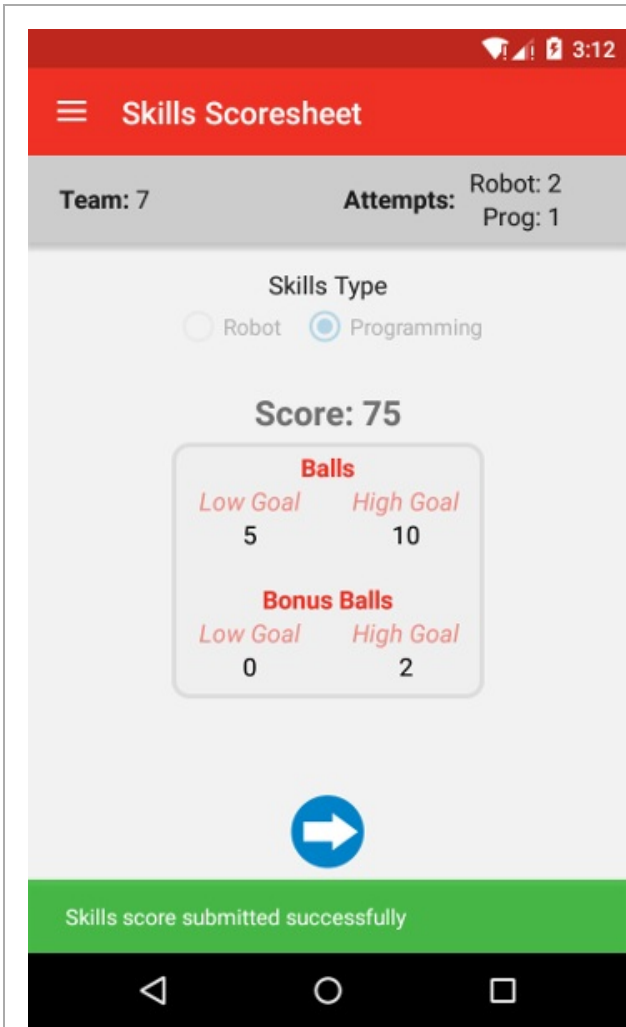


Figure 7-4 - Skills Score Confirmation

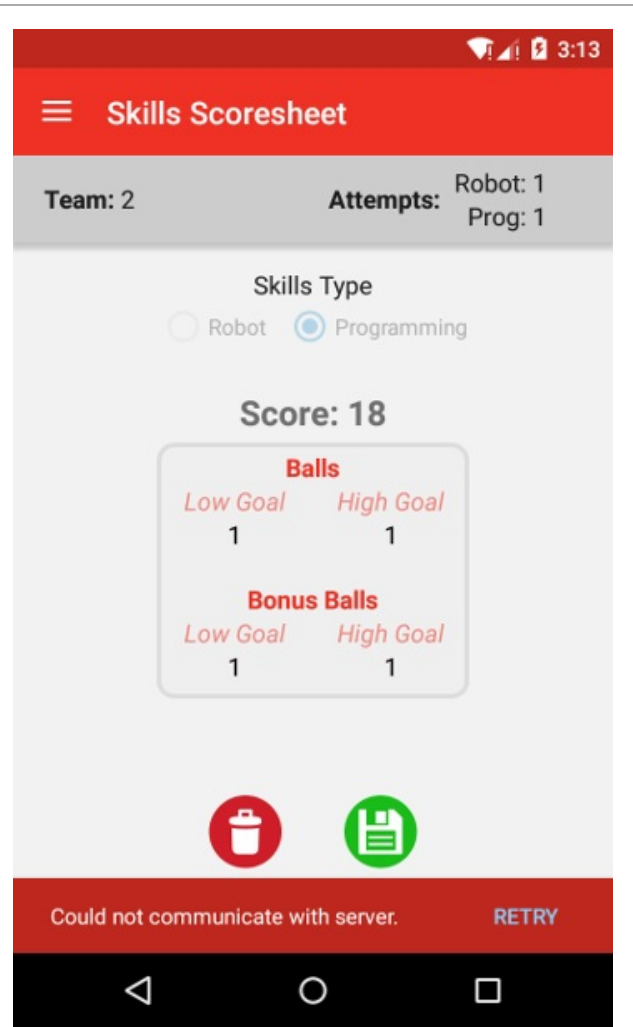


Figure 7-5 - Skills Score Confirmation - Server Timeout

Appendix A - FAQ

General

My event has multiple fields. Do I need to have a scoring device for each field?

Do you need multiple devices? No. Can you use multiple devices?. Absolutely. One device running **VEX TM Mobile** is capable of scoring all matches that are in the Tournament Manager database.

I get an error message indicating there is no connection to server. What should I check?

This error message indicates that there is a communication issue between **VEX TM Mobile** and the Tournament Manager Web Server. You should check the following:

- Is the web server running? You can tell by looking for the web server icon in the taskbar. See *Fig. 2-1*
- Make sure that your device and your Tournament Manager web server have IP addresses that can communicate with each other. This can easily be done by opening the web browser of your mobile device and navigating to the IP address of the web server. A web page showing a team list will be shown if the server is reachable.

I tried to start the Tournament Web Server, but I got an error saying that the port is already in use. What do I do?

If another application is using the port that the Tournament Web Server, that application will need to be closed before the Tournament Web server can be used. Skype is known to use port 80, and exiting it will allow the Tournament Web Server to start properly. If you're using Windows 10, there is a default service called IIS that runs on port 80. To stop it, open a command prompt with administrative privileges and run the command `sc stop W3SVC`. If you need additional help determining which application is using the port, [this page](#) contains a good tutorial.

Skills Scoring Role

My event has multiple skills fields. Can I have one scoring device per field?

Absolutely. When adding devices to Tournament Manager, multiple devices can be assigned the Skills Scoring role.

I submitted a skills score and just realized that it was the wrong type. What do I do now?

This can be corrected within the Tournament Manager *Skills Challenges* tab.

1. Find the match in either the *Robot Skills* or *Programming Skills* tab.
2. Right click on the match and select *Edit Score*
3. In the right pane, edit the score appropriately, and select the proper skills type
4. Save the score

Match Scoring Role

I submitted a score and moved to the next match, but Tournament Manager never received the submitted match. What do I do now?

This can happen if your wireless network or your web server had problems. The first thing to note is that you should never clear the field before seeing the confirmation on the field display that the proper match number was saved. If the field has not been cleared, you can recount if needed and resubmit the score from the tablet. In the case that the field was cleared, open the Activity Log from the **VEX TM Mobile** menu (Fig. A-1). Find the match that you tried to submit. If there was a network problem, or a server problem, you should see it with a status code other than 200 with a reason next to it. Tapping the row will expand it (Fig. A-2) and you will see the raw data that was sent in the failed submission. The tablet can be brought to the scorekeeper, and the values can be used to manually enter the score into Tournament Manager.

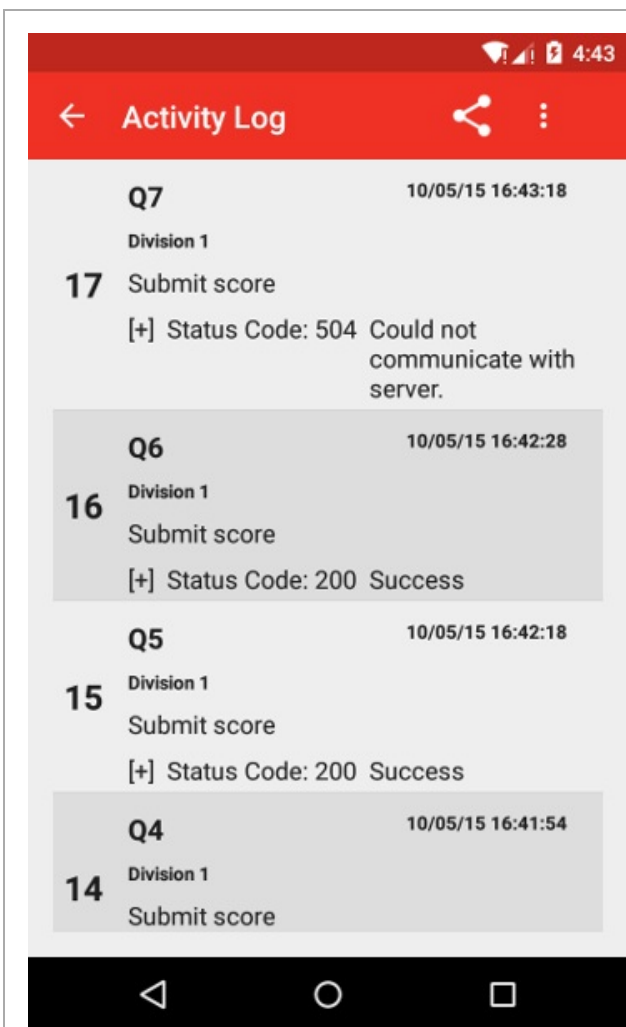


Figure A-1 - VEX TM Mobile - Activity Log Window

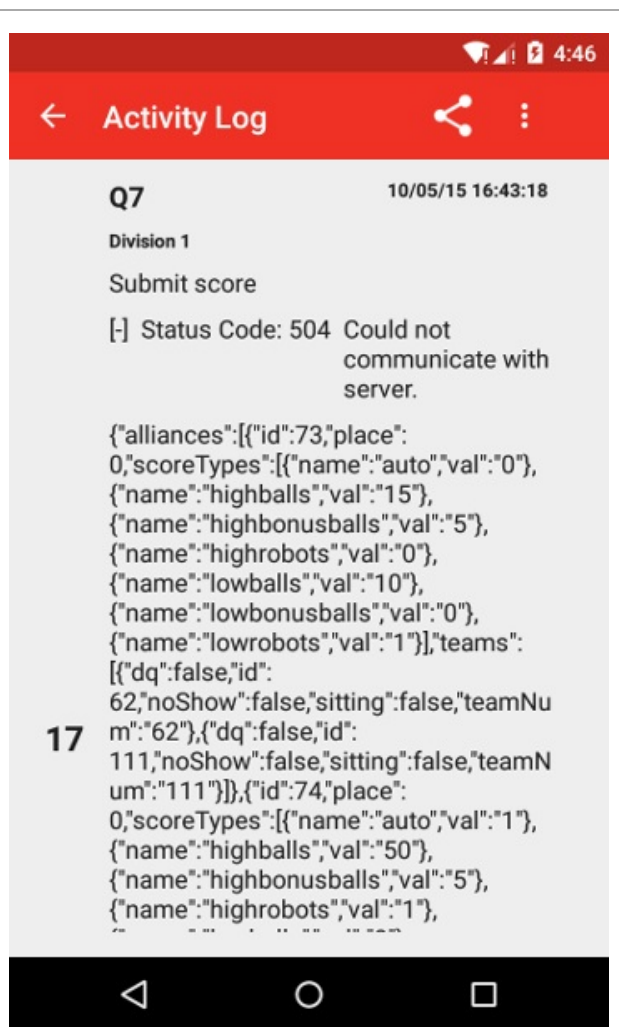


Figure A-2 - VEX TM Mobile - Activity Log Window Expanded