



# **FIVB E-SCORESHEET APP USER GUIDELINES FOR ORGANISERS**

**TABLET APPLICATIONS FOR COACHING STAFF AND REFEREES:**

- **ES BENCH**
- **ES REFEREE**



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Both the ES Bench & ES Referee Tablet Applications connect via **Bluetooth or Wireless** technology to the e-Scoresheet laptop (and be able to connect to any reserve laptops without delay). Two android tablets for each teams coaching staff and two android tablets for the Referees plus at least one reserve tablet. The Referees tablets must be fixed to their respective post, with the ability for the 2<sup>nd</sup> Referees tablet to be removed easily during the match. All tablets must be fully charged prior to each match.

The system will enable each teams coaching staff to request time outs and legitimate Challenge requests. In addition using their tablet they CONFIRM their players to be substituted. The quick substitution process must still be followed.

The ES Referee App will enable the 1<sup>st</sup> and 2<sup>nd</sup> Referees to be follow in real time team rotations, substitutions, timeouts and challenge requests in addition to the current score.

## Connectivity



ES Bench and ES Referee are designed to work using Wireless or Bluetooth connectivity.

For this option please ensure you install a USB Bluetooth Class 1 adapter onto the e-Scoresheet laptop. The Bluetooth integrated in laptops are not usually Class 1 and therefore will not cover 100m.

**IMPORTANT:** In some instances when used in large competition halls with high electromagnetic pollution, not just from spectators handsets but by also the TV broadcast signals and other functions within the competition hall, a **high quality wireless router** should be used (INSTALLED AT THE SCORERS TABLE) with each device connected via the dedicated LAN network and using a secure password.

In extreme circumstances the tablets can be connected via a hard-wired solution, however all wires must be safely installed around the playing court and as far as possible invisible. This solution must only be used as a very last resort.

# Configuration and equipment

## TABLETS

For this Application could be used any Android featuring 4.0 OS or later, with a minimum of a 7" display and must have Bluetooth and Wi-Fi connectivity (**suggested 5GHz, Wi-Fi 802.11 a/n/ac**).

## WIRELESS CONFIGURATION:

Wi-Fi architecture needs a good and powerful Router to improve a private Wi-Fi network. The 5GHz band routers are less used than the 2.4GHz ones. It must be considered choosing the Tablets and the Router.

After being installed, the Router should resolve the DHCP conflicts with the local network. Please make sure that the e-Scoresheet laptop has a fixed IP Address. The tablet App will request and save the IP address of the e-Scoresheet laptop. That's why is better to be sure that the IP address won't change (example: after rebooting the e-Scoresheet laptop).

However it is suggested to carry out some tests before important matches, where there are TV broadcaster, video repeaters, Audio mixers and other electronic and radio equipment.



## BLUETOOTH CONFIGURATION:

Bluetooth is an intelligent, good performing and cheap communication protocol that easily connects multiple devices with the Scorer's Laptop. But it is also fragile and sensitive to electromagnetic pollution.

It's recommend to install the Bluetooth adapter, because many laptops on the market do not feature a Class 1 Bluetooth option that is able to support communication at a distance of up to 100m.



However it is suggested to carry out some tests before important matches, where there are TV broadcaster, video repeaters, Audio mixers and other electronic and radio equipment.

## WIRED CONFIGURATION:

The wired architecture is based on the same Wi-Fi structure: it needs a good and powerful Router, to improve a private Wi-Fi and LAN network, and it needs two RJ45-USB adapters, compatible with the 7" Tablet model, with the appropriate LAN cable (min. 10 mt) and USB micro cable (min. 1.5m).

After being installed, the Router should resolve the DHCP conflicts with the local network. Please make sure that the e-Scoresheet laptop has a fixed IP Address. The tablet App will request and save the IP address of the e-Scoresheet laptop. That's why is better to be sure that the IP address won't change (example: after rebooting the e-Scoresheet laptop).

The wired configuration should run a LAN cable from the Router to the benches where the RJ45-USB adapters should be fixed, then the Coaches tablets are connected via USB cables. Place the Router on top or under the scorer's table.

***For any connection and configuration problems refer to a local LAN expert, to choose the best Wi-Fi free channel.***

***Data Project could not verify, support and solve any local transmission problem.***

## How to chose the best configuration

In consideration of the fact that the transmission and elettromagnetic pollution environment is different in any sporthall, we suggest to follow this approach in order to define the best local configuration and connection architecture:

- 1) Search on the web or locally a good router (2,4GHz and 5GHz)
- 2) Search on the web or locally a tablet Android with Bluetooth and Wi-Fi
- 3) install on e-Scoresheet Laptop the router
- 4) Make some tests of the connection and the aplication

Our suggestion is to make first some test with a standard 2.4GHz apparel. If the connection is not stable it will be possible to switch between the different 2,4GHz available channels (10). In case it is not possible to find a valid solution, a 5GHz tablet is recommended.

These tests have to be made before an official match in which TV broadcaster, audio wireless apparels, etc., are present in the sporthall.

Enable on e-Scoresheet the Bench Application in the Option and test the Wi-Fi connection on the court, near to the bench. Move the tablet far from the scorer table, test the connection using the [Test Speed] feature in the Test ES Bench menu.

# Wireless

Using the Wi-Fi technology some issues must be considered:


- Wireless communication will reduce the tablet's battery life
- A local network must be approved, considering the DHCP and its compatibility with other wired network, that may be present
- **E-Scoresheet laptop needs to have a fixed IP address**

We suggest, as written in the previous pages, that a powerful router, connected to the e-Scoresheet laptop, be located at the scorer's table, and be as close possible to the team benches and the 2<sup>nd</sup> referees position.

Once the IP address of the e-Scoresheet laptop has been finalised, in the software you must set [LAN Connection] and the IP address will be visible.

Options

General Federation Rules Data Video Shortcuts Share Data Scoresheet Referee LiteScore Video Challenge eScoresheet Bench

 ☐ Enable eScoresheet Bench

Server IP 10.0.0.58

LAN Connection Password 1234 LAN Port 50120

☒ Litescore Horn on Substitution Request

☒ Litescore Horn on Challenge Request immediately after the request arrive

Seconds the Challenge button is active on tablet after the end action 10 sec + -

**Reasons:**

<input checked="" type="checkbox"/> 1 BALL IN-OUT	<input checked="" type="checkbox"/> 3 NET TOUCH	<input checked="" type="checkbox"/> 5 CENTER LINE FAULT	<input checked="" type="checkbox"/> 7 ATTACK LINE FAULT
<input checked="" type="checkbox"/> 2 BLOCK TOUCH	<input checked="" type="checkbox"/> 4 ANTENNA	<input checked="" type="checkbox"/> 6 SERVICE LINE FAULT	

Ok Cancel

This IP address must be entered on the Tablet app.

Considering that each Tablet App will save this IP address to enable quick connection next time it is used, this IP address must also be fixed on the e-Scorers' laptop.

# Bluetooth

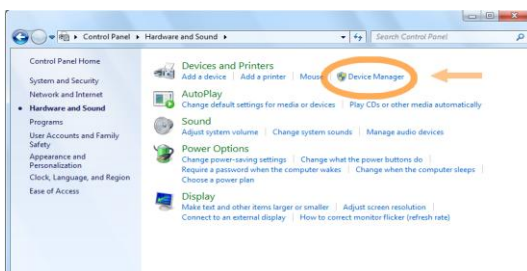
## How to install Microsoft driver for the adapter

Installations must be carried out by the host organiser prior to any technical meeting.

In order for e-Scoresheet to be run via Bluetooth, a **Class 1 Bluetooth adapter** must be installed on the EScoresheet Laptop using the generic windows driver.

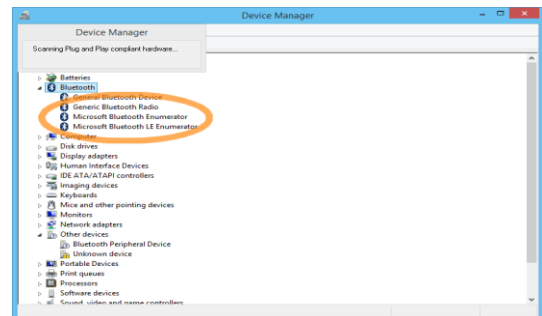
Follow the below instructions in order to verify what kind of drivers are installed and, if needed, how to install the correct one.

1. **DO NOT** plug in the USB adapter
2. Go to **Control Panel -> Hardware and Sound**



3. Click on **Device Manager**

4. Check to see if the Bluetooth adapter is already installed with a Microsoft driver, like the one circled.
5. Right click on the mouse and select **DISABLE** then confirm

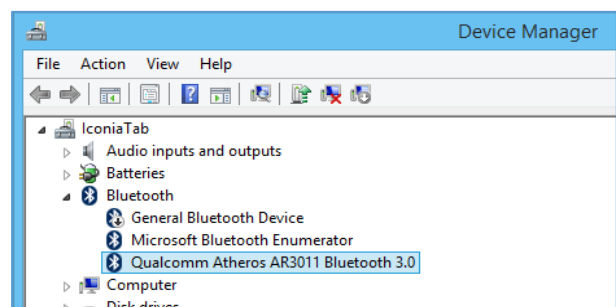


Please note only one Bluetooth adapter should be installed. It must be a Class 1.

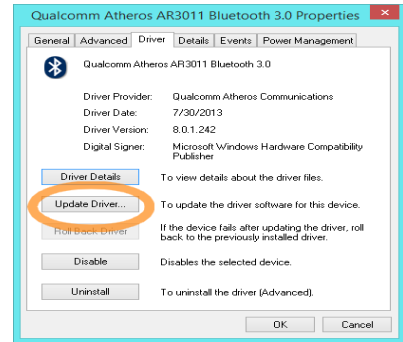


Once installed plug in the USB adapter

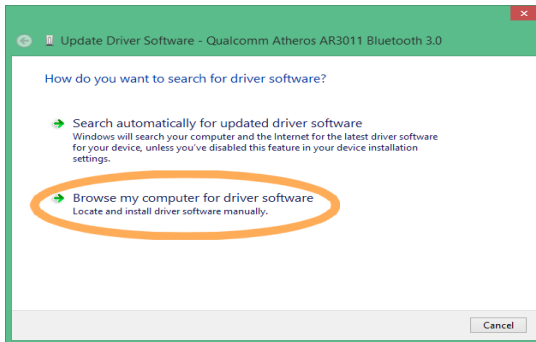
6. The Bluetooth adapter may install its own drives, they may look like this in the directory



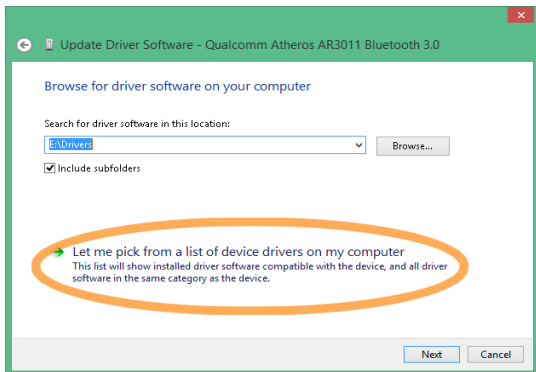
7. **Right click** with mouse on the Adapter name in the list and choose **Properties**.



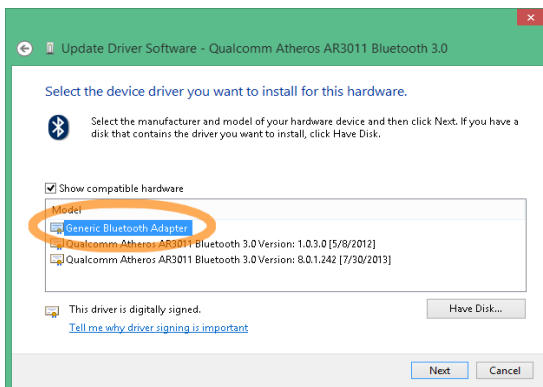
8. Click on the “**Update Driver...**” button:



9. Choose to **select the driver manually**:



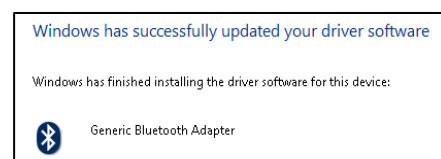
10. Select the driver from the local machine:



11. Select the **Generic Bluetooth Adapter** driver: and click **Next**.

Now the Bluetooth adapter is correctly installed.

A reboot may be required.





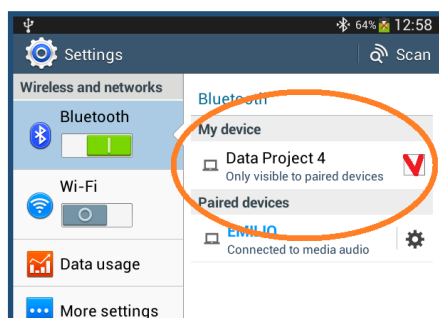
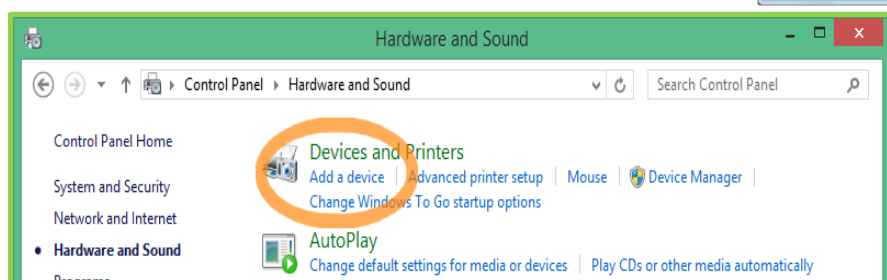
## How to pair the Android device.

In order to work with e-Scoresheet the Android device must be paired with windows on the EScoresheet Laptop. This operation should only be needed the first time a device is connected to a PC.

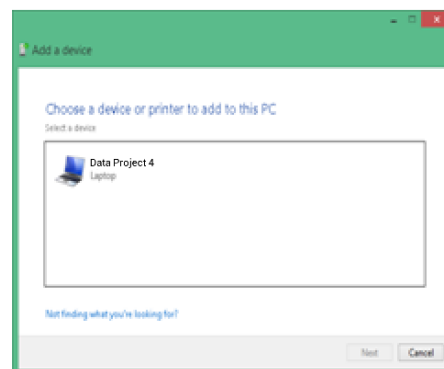
1. On the e-Scoresheet laptop go to **Control Panel -> Hardware and Sound**



2. Click on **Add a device**

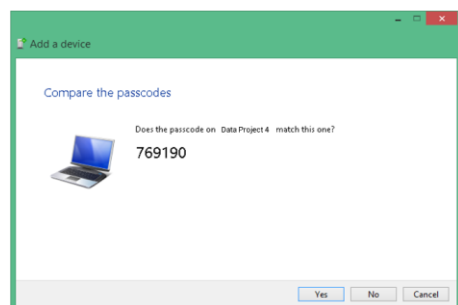


3. on the Android tablet go to Settings-> Bluetooth and click on the label **“Only visible to paired devices”**



The tablet is now discoverable and it should be listed in the this window on the laptop:  
Select the device in the list then click on the “Next” button.

4. A window with a passcode will be displayed.



Make sure the same code is displayed on the Android device too then click on **Yes**.

Repeat this process for all the Android devices needed.

The “pairing” process should only be initiated the first time a device is used with a laptop, however if different laptops or tablets are used they must paired as above.

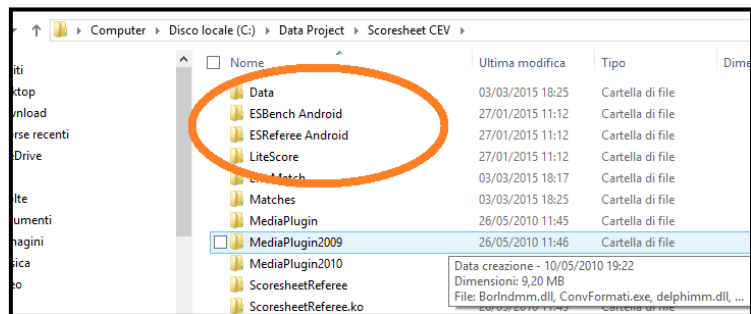
## How to install the first time the App on the tablet

Install e-Scoresheet on the laptop (or open and download a new version). The new files will be downloaded to the folder **C:\Dataproject\Scoresheet FIVB**. You will see two folders

- **ESBench Android**
- **ESReferee Android**

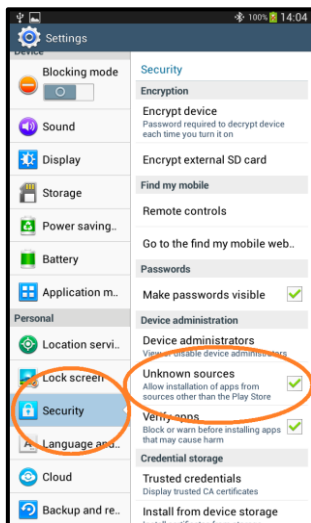
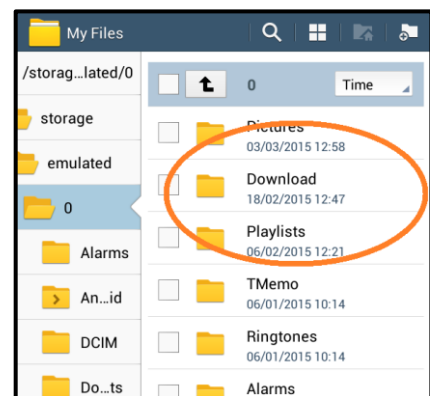
In each will be a specific application file, with extension **.apk**.

Copy these application files to each tablet that is to be used.



Then:

1. Connect the tablet with the USB cable to the e-Scoresheet laptop
2. Click on one of the new folders the first .apk file
3. Paste the .apk file into the tablet's file system >**Tablet** > **Download** folder
4. Repeat this procedure for both files



After that, on the Tablet home page check in the folder **Setting>Security** to see if it is possible to install applications from Unknown sources.

On the Tablet, enter the file system (My File icon) and install both ES Applications.

- Enter the Download folder
- click on each apk file (ES Bench and ES Referee)
- confirm the installation.

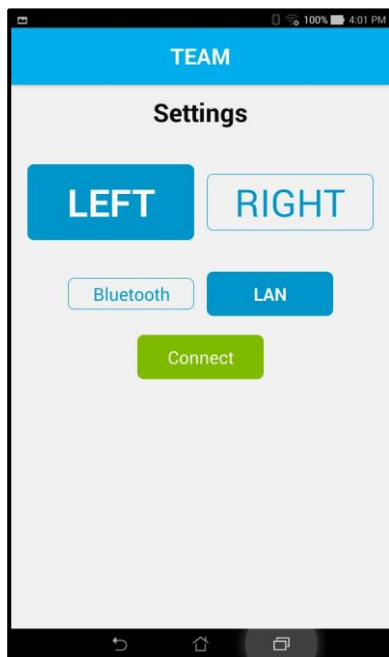
This procedure must be followed the first time an ES App is installed on a new Tablet.

And every time there is a e-Scoresheet automatic update: if running the ES Bench or ES referee app a white windows will advise that the app version is not compatible with the e-Scoresheet release, the previous procedure has to be applied.

Finally it is recommended to place the ES Beach and ES Referee icons in a clear and useful position on the home screen of each tablet.



## How to connect the Tablet to e-Scoresheet



Entering the Tablet application, either Bench or Referee, you must choose either **Bluetooth** or **LAN**

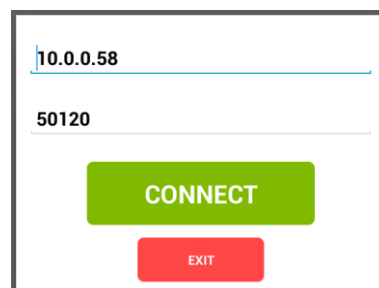
Given the tablets now remain at the benches and do not follow the teams you must also define if the tablet will be located on the **left bench** or on the **right bench**.

As the tablets will remain with on the respective sides of courts (at the team benches) e-Scoresheet that will automatically switch the team's data onto the correct tablets.

### LAN CONNECTION

In the next window you must type IP address of the e-Scoresheet laptop.

It will be possible to connect more than two ES Referee Apps (e.g. for the Video Challenge referee, and/or the Referee Delegate), but only two ES Bench Apps - one for each team.



### BLUETOOTH CONNECTION

Selecting this connection protocol, once you click on [Connect] the App will search for all the devices that are available.

When the e-Scoresheet laptop's name appears, all you will need to do is click on it (the laptop name) and wait for the pairing procedure (be patient as it will take time and may need 2/3 attempts).

The first time any Tablet App is connected to the e-Scoresheet laptop a password is required.

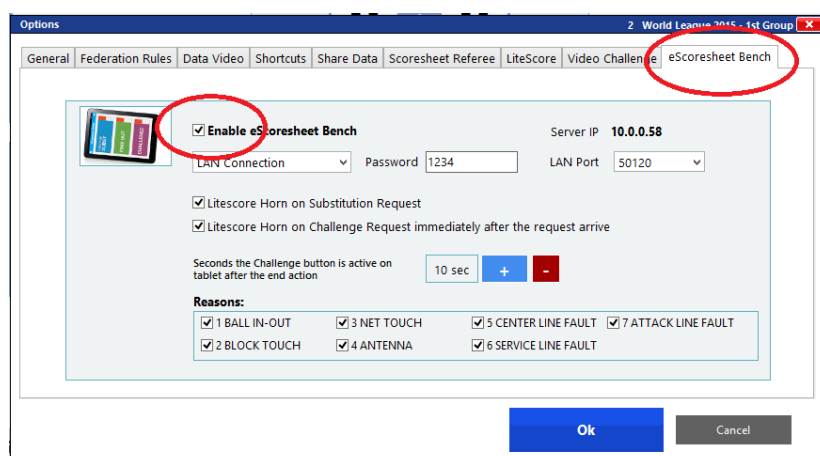
If it has not been modified in the e-Scoresheet Option the password will be : **1234**

## Before the match

### SETTING UP THE E-SCORESHEET TOOL

The EScorer must enter “Options” in EScoresheet and enable this function:

- Set the LAN or Bluetooth connection
- Set the Litescore options
- Set the Video Challenge requests

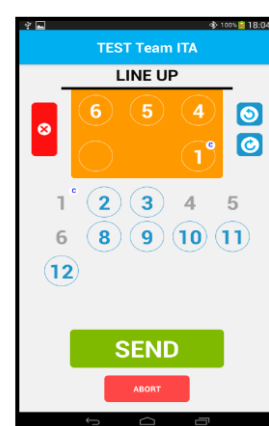
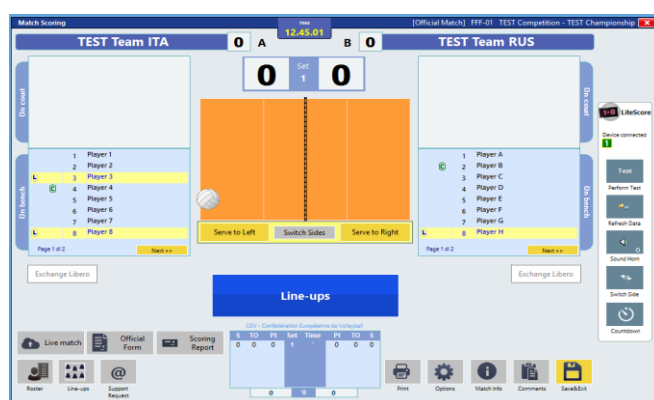


### CONNECTING THE TEAMS TABLETS TO E-SCORESHEET LAPTOP

1. The e-Scoresheet Bench App “**ES Bench**” must have been previously downloaded onto the (android) tablets
2. The scorer must first run e-Scoresheet on their laptop from the e-Scorers workstation
3. each tablet must be connected to e-Scoresheet laptop: one as the **Left** team and one as **Right**.
4. Once connected, they must stay on the respective bench for the duration of the match.

### STARTING LINE-UPS

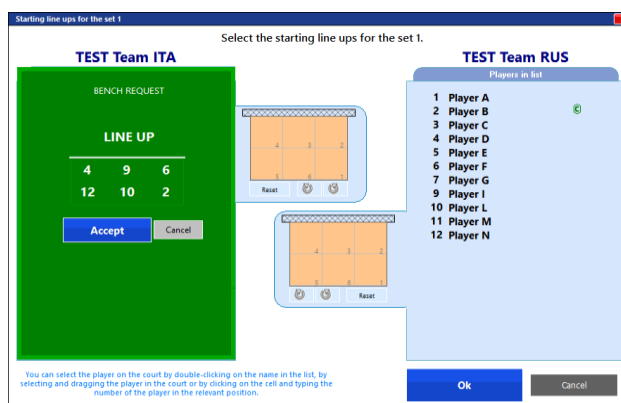
1. The Coaches or nominated Bench personnel member must transmit the starting line up to the e-Scorer via their paired tablets.
2. Line ups from each team must be visible on the e-Scoresheet and Referees tablet at least 12 minutes before the match. This image will also be shown on the FIVB Supervisors monitor. .



3. The Coach or nominated Bench personnel member presses the LINE UP button and enters the starting line-up.
4. He/she can change the player's number or, in any case, click on the red button **(X)** and reset the entire Line Up previously entered.

5. This is confirmed and transmitted by pressing “SEND”.

The starting line ups will show as below



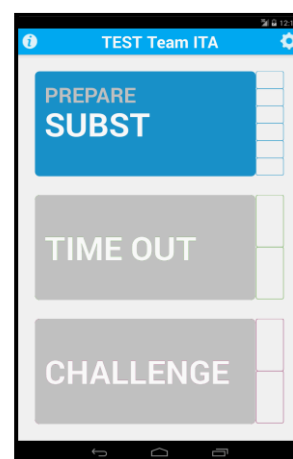
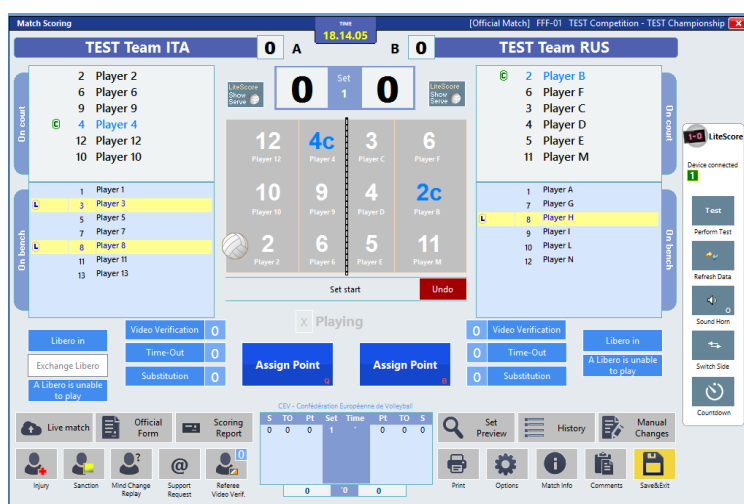
6. The eScorer can then choose to accept the submitted line-up in the main window
7. The starting Libero will be permitted to enter the court in the usual way after checking by the second referee
8. The first libero to enter the court is considered to be the starting Libero.
9. The Captain on court will be recorded by the e-Scorer following instructions from the 2<sup>nd</sup> referee
10. The 2<sup>nd</sup> Referee will use his/her tablet before the match to check each team's line up. Should modifications be needed following a mistake or requested correction, these must follow the FIVB Rules in force at the time.
11. The 1<sup>st</sup> Referee will also be able to view the line ups on his/her tablet fixed to the post.



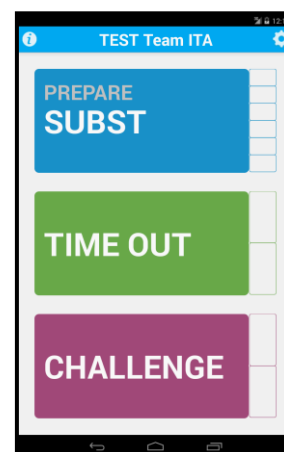
## During the match

During the match the tablet will have 3 buttons indicating Substitutions, Timeout and Challenge. Each of the buttons has a “progress” bar showing the number of requests made for each action.

1. A major change is that the eScorer must click on “START RALLY” when the 1st referee blows their whistle.
2. Pressing the “START RALLY” button will disable the Time Out and Challenge requests (Substitution preparations can still be made) on the coaches tablets.
3. Whilst enabled to prepare substitutions during a rally a request can only be made when a point has been awarded and the rally ended.

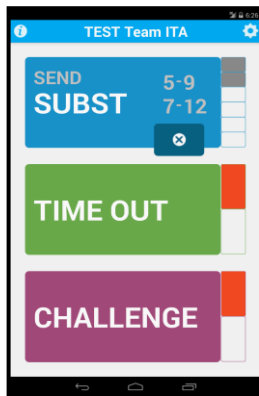


4. When a point is recorded, the buttons ‘START RALLY’, “TIME OUT” and “CHALLENGE” will be enabled once more.



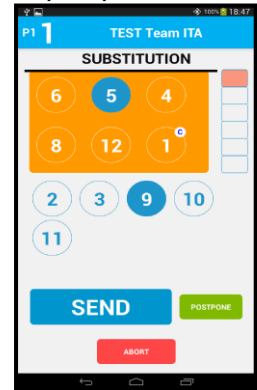
# SUBSTITUTIONS

1. The bench personnel press the “PREPARE SUBST” button on their tablet (see above)
2. A window with the current line-up will appear with the players eligible for substitution.
3. Using the tablet coaches request substitutions by clicking on the numbers of the players entering and leaving the court. They are then highlighted.
4. It's possible to enter 2 or 3 or more substitutions at the same time, in this window. It is not possible to enter another substitution once sent or one has been postponed.
5. If the players have been previously involved in a substitution the partner player will be automatically highlighted.
6. Once entered, the team can choose to send the substitution to the eScorer (if the rally is running) or postpone the request.
7. The pending substitution will be displayed in the “SUBST” button.



8. The team can also cancel pending substitutions by clicking “X” on the “SUBST” recap button

9. At the end of the rally, by clicking on the “SUBST” Send button again the coach can “SEND”



10. If used the LiteScore unit will sound and show the player's number to be substituted on the LED display.

11. the scorer will only accept a substitution request if the players enter the substitution zone and begin the quick substitution process.

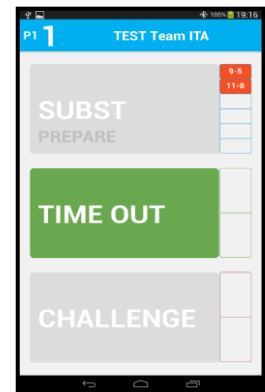
12. The e-Scorer upon seeing the players entering the substitution zone will “accept” the app request.
13. The substitute(s) must still enter the substitution zone without delay and with the appropriate paddle(s) raised high showing the player(s) to leave the court.
14. The official “REQUEST” for a substitution is the entrance of the substitute(s) into the substitution zone.



15. The Coach or Game Captain does not need to make a signal (Note: in case of a forced substitution due to injury the coach or indeed the game captain may, of course, make the substitution signal to the second referee who will authorise the substitution in this case.)
16. The quick substitution process must not be delayed in any way.
17. The substituting player goes immediately to the side-line close to the net post within the substitution zone, to make the paddle-exchange with the player on court. This process is observed by the 2nd Referee who will only intervene if the players create a delay or the coach does not send the information via the Tablet app – hence creating a delay – which will be signalled by the scorer again by use of a buzzer.
18. Once a player enters the substitution zone with the numbered paddle, and the buzzer/whistle is sounded, a substitution must be completed.
19. Once the buzzer/whistle sounds, a team which retracts its request for substitution automatically causes a delay, and a delay sanction will be charged against the team.
20. In the case where the player(s) enter but the coach has not sent this information via the tablet and a delay is caused, the substitution(s) are denied (refused) and the team is sanctioned for “delay”.



21. The instant the substitute player(s) enter the substitution zone, with the appropriate numbered paddle(s) the e-Scorer:
  - a) Then the e-Scorer will raise both arms to indicate that he/she is ready for the next rally. (Note: there is no necessity for the e-Scorer to raise one hand to signify at the start of the process that the substitution event has been recognized – the sounding of the buzzer carries out that function).
22. Using the eScorer bench app a coach cannot request an illegal substitution (please see below for exceptional substitution) however a substitution can still be denied should the wrong players enter or leave or a delay in the process occur.
  - a) The e-Scorer pushes the buzzer (again) and indicates the illegality of the substitution by waving one hand back and forth.
  - b) The Second Referee will blow the whistle to indicate the illegality of the substitution to the 1st Referee, who gives the team the appropriate delay sanction.
  - c) The substitution is rejected automatically in this instance.
23. In the case of multiple substitutions by the same team, all must be made at the same time.
24. In the case of both teams making a request, the e-Scorer will indicate which team should complete their substitution first.
25. In all cases, the 1st Referee has the right to authorise the next service after having seen the e-Scorer's two-handed "READY" signal at the completion of all team substitutions and both teams are ready to play.
26. The number of completed substitutions, and the player's numbers, will be indicated by the lighting of the progress bar slots in red.
27. The e-Scorer must report the 5<sup>th</sup> & 6<sup>th</sup> substitution of each team to the 2<sup>nd</sup> Referee, who will pass this information to the team Coach and the 1<sup>st</sup> Referee as per the Official Rules of the Game (24.2.7)
28. For the 5<sup>th</sup> substitution a yellow square will surround the Substitution button on the respective tablet.
29. Upon reaching 6 (or the maximum available) the substitution button will automatically be deactivated.
30. Should a coach need to make an exceptional substitution as provide for in the rules of the game this can be done by pressing the "EXCEPTIONAL" button.



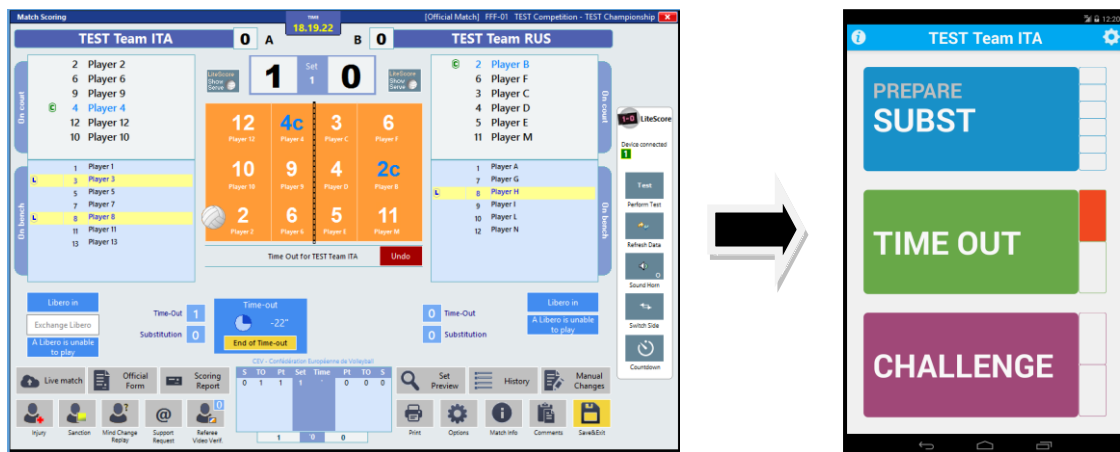


## TIME OUTS - REQUESTED BY THE TEAMS - 30 SECONDS

1. During the rally the Time Out button will be silver.
2. Once the request is made using a Tablet, the LiteScore unit will sound and a flashing LED light will indicate the team requesting the time out.
3. The LiteScore unit will sound and a flashing LED light will indicate the team requesting the time out.
4. One or two LED lights on the LiteScore will indicate the number of time outs a team has taken.
5. A countdown clock will display the remaining seconds of the time out.
6. A second time out or new request by the opposing team will be authorised during the same stoppage according to the official rules.
7. Any subsequent request must be made using the tablet and confirmed by the e-Scorer.



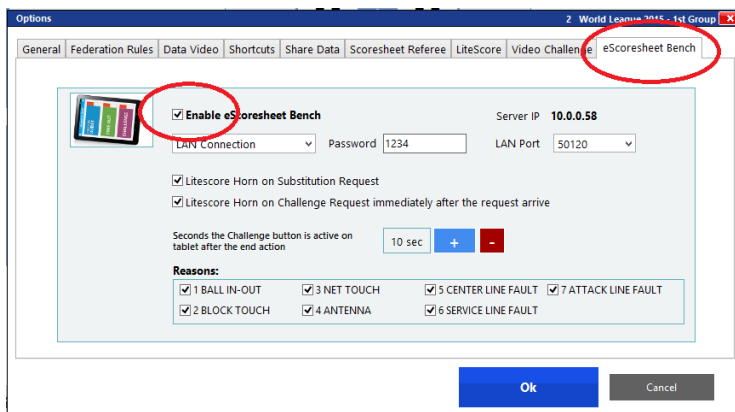
8. Once accepted the progress bar will indicate in red the number time outs taken
9. Upon reaching the teams requested time outs (two) the button will be deactivated.



## CHALLENGE SYSTEM

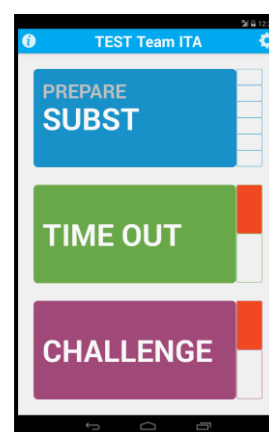
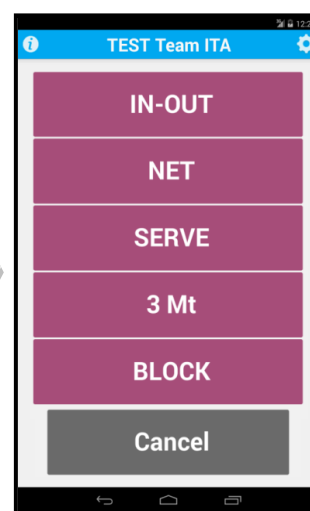
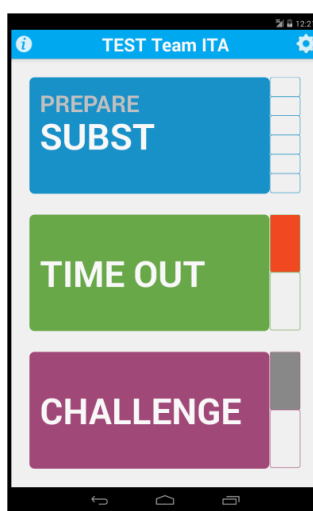
The FIVB Challenge System regulations in force at the time will be applied. The e-Scoresheet bench application in conjunction with LiteScore can be used to indicate a challenge as below.

Before the match the eScorer enters the options menu and turns on Challenge system



E-Scoresheet will have within it a function that will allow the type of Challenge system that is being used and will in turn ensure the correct configuration is shown on each tablet.

1. During the rally the Challenge button will be silver.
2. When a challenge is requested by a coach on their tablet the progress bar will change colour to silver indicating the request has been acknowledged.
3. A second window will appear where the coach must indicate the nature of the challenge they are making.
4. A request will appear on e-Scoresheet which the e-Scorer (directed by the reserve referee) can accept or deny.
5. Following a review of the video, should the challenge be denied then the progress bar for challenge will indicate red on the coach's tablet?
6. Upon reaching two incorrect challenges (progress bar red for both) the "CHALLENGE" button for this coach will be deactivated.
7. If the challenge is agreed then the silver progress bar indicator will become clear once more.



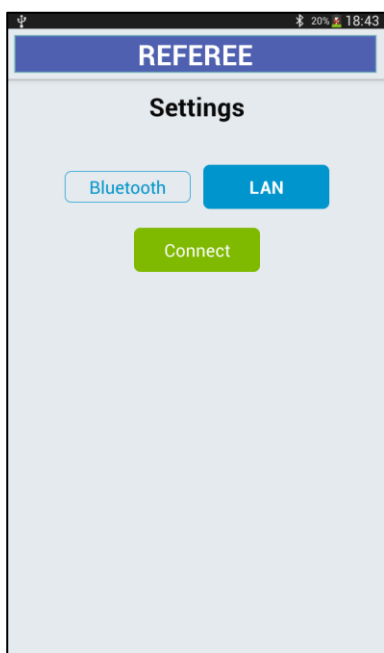
## Referee Application

On the post of the 1<sup>st</sup> and 2<sup>nd</sup> referees it is expected to fix two tablets where will run the ES Referee Application.

Tablets, same characteristics as the previous one used for the Bench App (Android OS, 7" display, Wi-Fi and Bluetooth), will be fixed on the post with special supports and elastics.

By the way any solution adopted to fix in a good and solid condition is welcome.

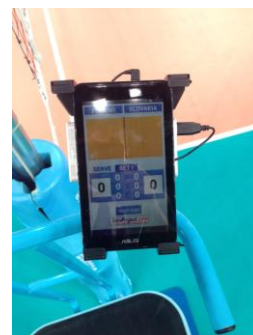
The App will be installed on the tablets in the same way described above.



Entering the Tablet application it has to be chosen [Bluetooth] or [LAN], as in the ES Bench App.

And then, in the next windows, has to be selected the recognized e-Scoresheet laptop or typed his IP address.

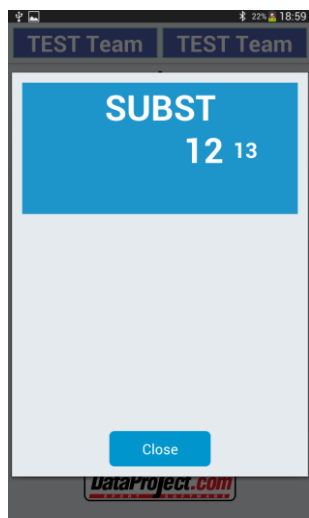
It will be possible to connect more than two ES Referee app (e.g. for the Video Challenge referee, or for the Referee Delegate), but only 2 Bench App one for each team.



Once connected, it will be presented the main windows with all the data regarding the team rotations, the score and the requests

- S (substitutions)
- T (timeouts)
- C (challenges).

The referee has only to [Switch Team] side, eventually, just at the beginning of the match.



When there is a request from the Coach, using the Bench Tablet, a window with all the relevant information will appear on the Tablets of the Referees.

They have to close this windows when the request is completed.

In case of simultaneous requests from both benches (e.g. Substitutions) a double sided window will appear.

## LITESCORE

LiteScore is a portable scoring system that is connected to e-Scoresheet. It automatically displays the official score, sets won, the number of time outs and substitutions for each team. During the match it can display:

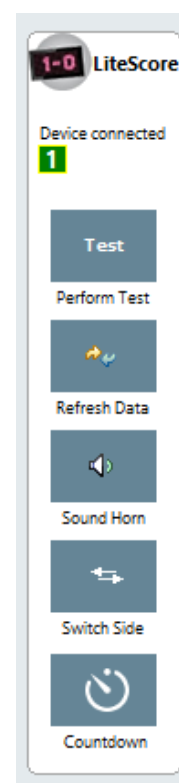


- The score of a volleyball match
- Indicate the serving team with a light below the respective teams score
- Show the number of the player serving upon request
- Sets won - indicated by LED lights
- Time outs - indicated by LED lights (flash during requested stoppage)

## LITESCORE INTEGRATION WITH E-SCORESHEET

LiteScore is designed to work with e-Scoresheet and display in real time the score and data of a match. Once LiteScore is successfully connected, via a USB stick, to the e-Scoresheet laptop (and the driver is correctly installed), a vertical box (see right) with information buttons will appear on the right of the e-Scoresheet main window. The functionality of each button is clearly shown and is easy to understand. These functions are clearly described in the e-Scoresheet handbook.

When the background colour of this box turns red it indicates that LiteScore is disconnected or turned off. Once LiteScore is reconnected or turned on, e-Scoresheet will rebuild the connection in just a few seconds.

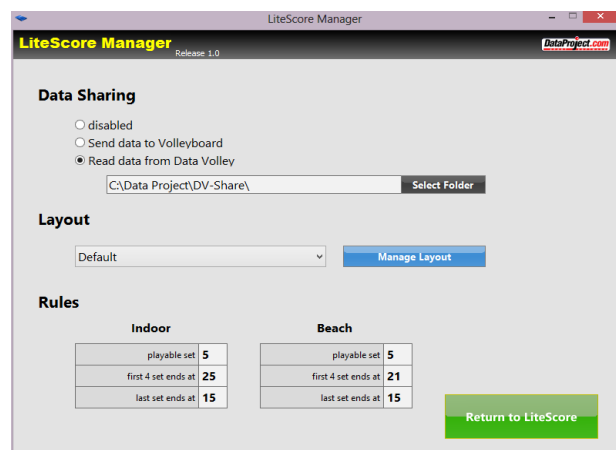


## LITESCORE INTEGRATION WITH DATA VOLLEY

LiteScore Manager is a windows based software that enables an interface between Data Volley and the LiteScore software - this means it can also receive the score directly from the statistical software

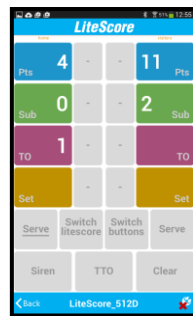
It's enough to run LiteScore manager in the background and to define in the [Option windows] the path of the Data Volley Share folder on the Data Volley laptop for the systems to work.

LiteScore Manager can be used to manually change the score and the other LED fields that are connected to LiteScore

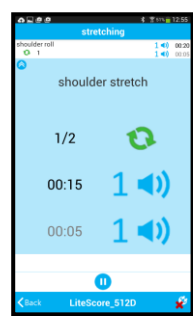
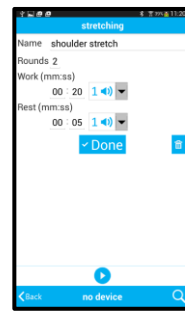
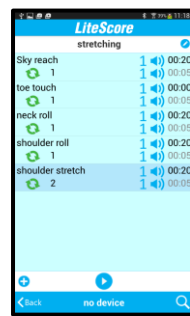


## LITESCORE VIA BLUETOOTH

The Android LiteScore App to drive the LED data with any Android Smartphone is available for free in the Google app store. This is a great tool to support coaches during training sessions and friendly matches.



**MATCH**



**DRILLS**