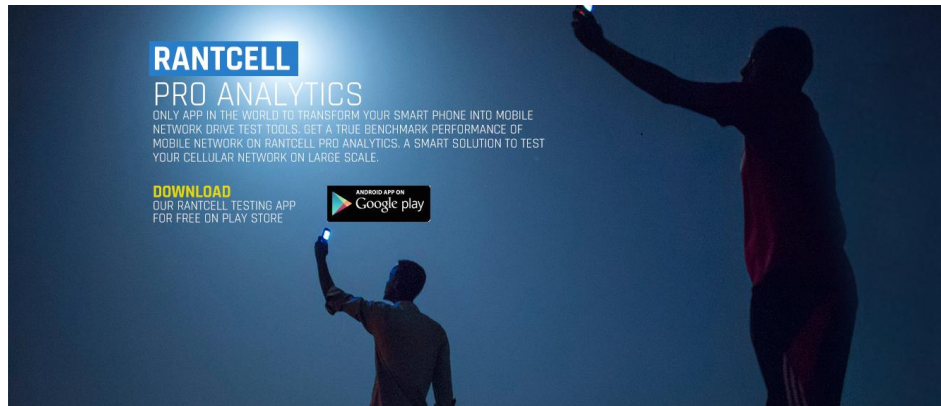


RantCell Pro App User Guide



Title: RantCell User Guide
Last edited: November, 2015
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<https://www.rantcell.com>
Email:support@rantcell.com



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Introduction



Mobile operators and the services offered over their network goes through a strict scrutiny everyday as mobile phone users' expectations has raised to a new level. Operators need to have a sense or measure of inadequacies of the network beforehand and be prepared to work upon the fixing the problems even before customers experience or complain about it.

In this kind of a scenario it's very important for operators to be ahead of the game and the best way to accomplish it is by having a real time sense of the "Mobile experience" of a user. One stop solution for these challenges is "Mobile Subscriber Experience Software".

RantCell is a top notch Mobile Subscriber Experience smart app which helps Mobile operators to measure the Quality of Service their network is offering to its customers. RantCell is a revolutionary application as it minimizes the operational costs involved to test a network to a great extent.

RantCell is a true network benchmark tool for telecom operators, small cell and field test engineers to check network performance and also to measure the key performance indicators (KPI) such as Ping test, data speed and Voice call test of 2G,3G, 4G (LTE),Wi-Fi and CDMA Networks. RantCell includes everything needed to test network coverage, performance and Signal quality. A smart way to test your cellular network on large scale and highly cost effective.

RantCell Cloud analytics is a service offered for RantCell pro app users who can check the test result and drill down test analysis in one place Rantcell.com. A rich graphical interface provided to users to analyse the test data in graphs, map and date time query.

What is RantCell Pro App?

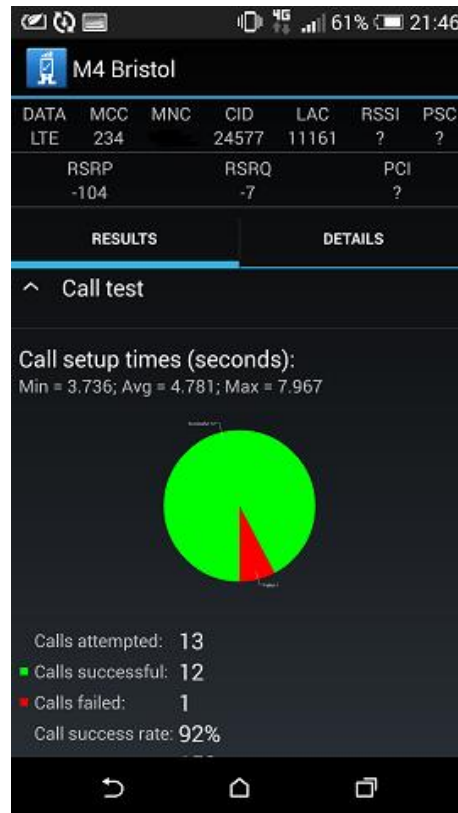
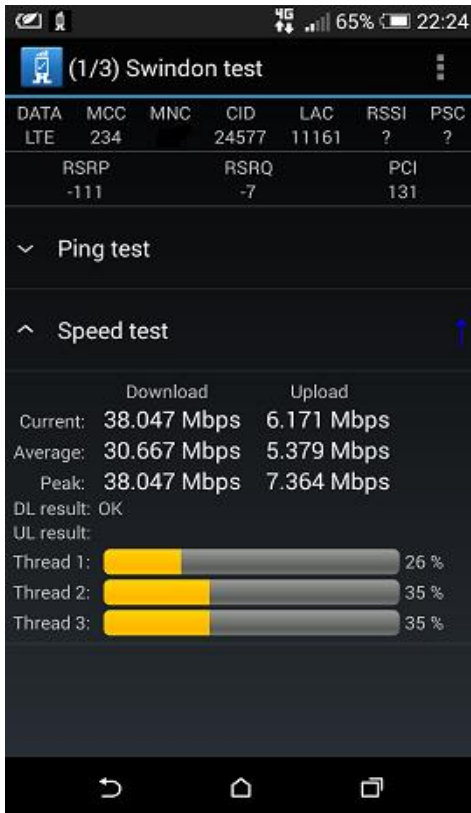
App can transform your smart phone into mobile network drive test device. It is a true network benchmark tool for mobile operators, labs, OEMs, Device testers, small cell and field test engineers to check network performance and also to measure the key performance indicators (KPI) such as Ping test, data speed and Voice call test of 2G,3G, 4G (LTE),Wi-Fi and CDMA Networks. RantCell includes everything that you need to test network coverage, performance and Signal quality. Get a true benchmark performance of mobile network on RantCell Pro Analytics.





Features of RantCell Pro App

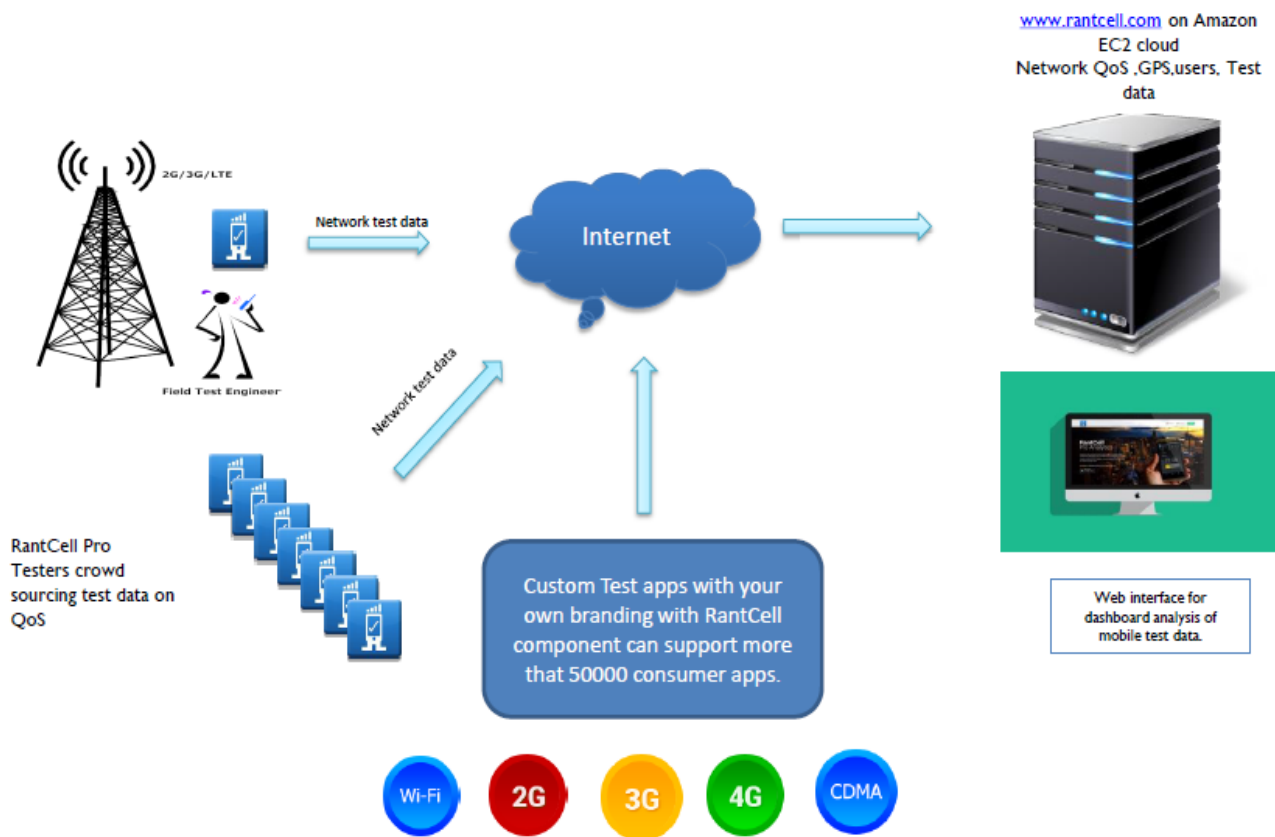
- ✓ Can be installed on any Android Smartphones
- ✓ Works on 2G,3G,4G LTE,VoLTE and CDMA networks , even WiFi
- ✓ Quick to download, install and simple to use which is available on Google Play Store
- ✓ Perform long repetitive tests of Speed test, Ping test and Voice call test, quick to setup tests.
- ✓ Uploads test data automatically to RantCell cloud server (www.rantcell.com) which can be accessed immediately.
- ✓ Test your network’s call performance, data speeds, Packet drops and latency and Voice call setup time
- ✓ Capture vital information about mobile network operator name and mobile network parameters such as MCC, MNC, Cell ID, LAC, RSSI (signal strength), RSRP, RSRQ, PCI ,PSC
- ✓ Capable of capturing ISP provider when on WiFi.
- ✓ Location based analysis included through drive test
- ✓ Supports remote scheduling of tests on the device from cloud server.
- ✓ Supports live tracking from the RantCell cloud server
- ✓ Ability to customize time interval between tests, the number of ftp connections and number of iterations
- ✓ Logs map information while running tests
- ✓ Graphical representation of the test results
- ✓ Maintains history of test results data
- ✓ Share test results instantly in excel format with the stake holders via email
- ✓ Configure up to 50 iterations of tests





What is RantCell test analytics cloud server

All the tests that are performed on RantCell Pro app is aggregated into the RantCell cloud server (www.rantcell.com) and the data can be retrieved for post analysis. The dashboard can be accessed by logging with user name and password through well-known web browsers. Dashboard provides users with rich graphical dashboard with interactive maps and graphs to analyse the test data. Following figure shows the interaction with cloud server and the apps. Typical user account can be paired up with up to 5 test devices. For more device licenses per account please contact support@rantcell.com





Features of RantCell Cloud Analytics:

- ✓ **RantCell Cloud Analytics** provides a great platform to analyse test results performed over various mobile devices.
- ✓ Perform test analysis on real time , as the test data are automatically updated into the cloud server.
- ✓ Supports 2G,3G,4G LTE ,CDMA and Wi-Fi test data analysis
- ✓ RCA helps in graphical representation test result data through Pie chart, Bar graph, Table view and Map view
- ✓ RCA dashboards gives historical views of tests performed and build a mobile network footprint. Variations thus observed between tests results and time conducted mobile operators can foresee their area of opportunities and address them on real time basis.
- ✓ Map View coverage can check performance network coverage, signal strength, download speed and upload speed etc.
- ✓ Users can also perform competitor analysis on network speeds, coverage maps, RAN technology, latency etc.
- ✓ Real time tracking capability of multiple test devices
- ✓ Remote test feature which can enable users to manage tests on remotely located devices
- ✓ Supports up to 5 devices for non-enterprise account. Please contact support for further devices.
- ✓ Share the test results in social media such as facebook or twitter.
- ✓ Share the test results in encrypted URL instantly with the stake holder.



Installation procedure for RantCell Pro app

Installation Requirements

Android based Smartphone
Android OS Version 2.3 or higher

Download and Install from Google play store

<https://play.google.com/store/apps/details?id=uk.co.megrontech.rantcell.pro>

1. Tap on Install on the RantCell pro app on Google play store
2. Please read through the “Terms of service” and “Accept”.
3. Login if already registered else tap on “Sign up” to reach RantCell.com registration page.
4. Fill all mandatory fields to register

Note: If mutiple attempts to register fails please contact us at support@rantcell.com

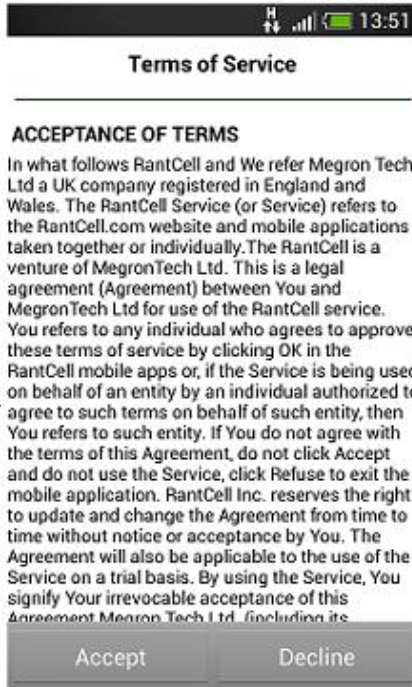


Installation Steps

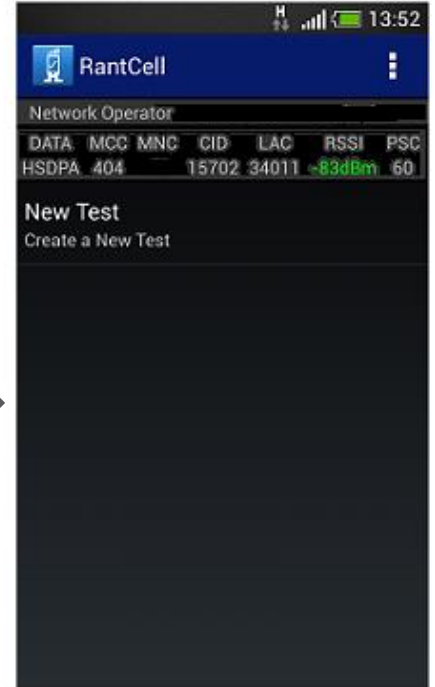
Select Install



Read terms and Select Accept



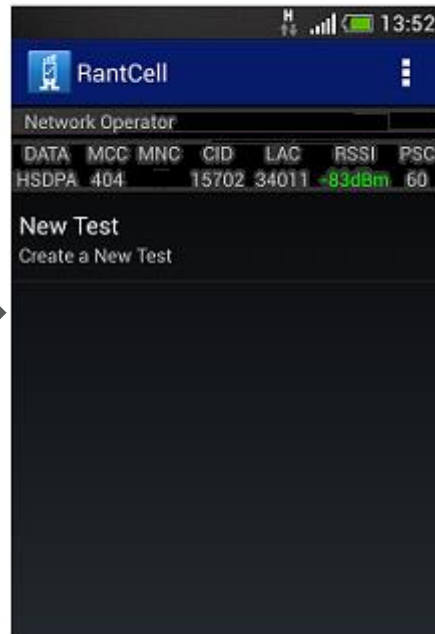
Home Screen of App



After entering details, Tap SignUp



Home Screen of App





Login to RantCell Pro App to pair the device (Mobile) with RantCell Cloud account

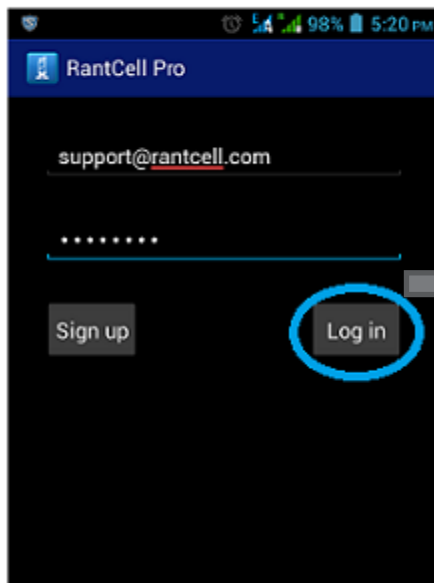
If you do not already have RantCell account please sign up at following link

<https://www.rantcell.com/register.html>

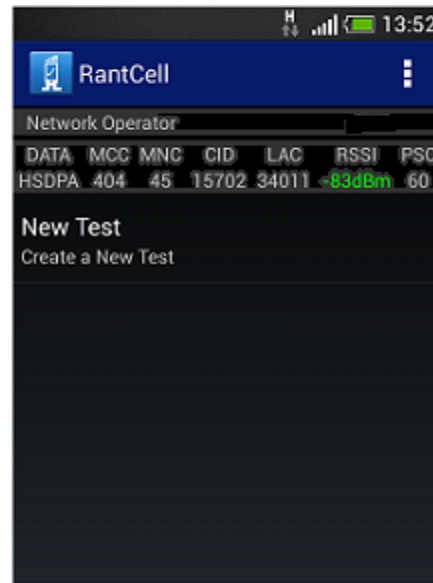
If you are already an existing user please follow the steps below:

1. Launch the RantCell Pro App to see the login screen.
2. Please enter the username (email ID) and password to login.
3. Once the login is successful the device (mobile) is now paired with RantCell.com account.
4. All tests that are performed from RantCell Pro on this device (mobile) shall be available in dashboard to view real time or for later analysis.
5. Please note that once the device is paired with account automatically one device licenses shall be consumed and this cannot be reversed either by uninstalling or logging out.
6. Please note that login might not be successful if the number of registered device exceeds the number of allowed devices licenses as per purchased subscription type. Maximum allowed limit of devices is 5 per user account.

After Entering Details, Tap Login



Home Screen of App





7. Once the login is successful in the RantCell Pro app on your device (Mobile phone) , please cross check in the RantCell account at www.rantcell.com if the device is visible on the dashboard as highlighted below under Test Data option.If the device is visible under your account then the device is successfully paied with RantCell cloud server. And tests performed using RantCell Pro app should be visible under the device tree on test as shown below



RantCell Test Analytics



Login

 Remember me
[Forgot Password ?](#)



Browser address bar: <https://www.rantcell.com/pages/dashboard.html#/app/mainview>

For quick access, place your bookmarks here on the bookmarks bar. [Import bookmarks now...](#)

Header: RantCell | sreenivas.midatala@megrontech.co.uk

Dashboard Metrics:

- 15536 Remaining Test Minutes
- 13 Registered Devices
- 33062 Total Test Conducted
- 15 Detected Networks

Left Sidebar (Test Data):

- Samsung Galaxy Nexus
- Samsung SM-G900F
- HTC One SV
- Samsung GT-N8000
- Samsung SM-G900F
- Samsung SM-N9005
- Samsung SM-G900F

Main Content:

- Map View: Shows a map of the region around Almonds, Stoke Gifford, and Frampton Cotterell. A green path is highlighted on the map.
- Graph View: Shows a line graph of RTTAVG (ms) over time. The y-axis ranges from 0 to 6,000. The x-axis shows dates from 2015-11-12 to 2015-11-25. A significant spike in RTTAVG is visible on 2015-11-25.

Browser address bar: <https://www.rantcell.com/pages/dashboard.html#/app/mainview>

For quick access, place your bookmarks here on the bookmarks bar. [Import bookmarks now...](#)

Header: RantCell | sreenivas.midatala@megrontech.co.uk

Left Sidebar (Test Data):

- Sony C5303
- Show All
 - test234
 - load call test
 - voice call
 - CS load test

Main Content:

- Map View: No test data found. Please try different date and time range.
- Graph View: No test data found. Please try different date and time range.

List of Campaigns: December 2, 2015 08:48 - December 2, 2015 09:48

<input checked="" type="checkbox"/>	Campaign Name	Test Name	Device	No of Iterations	Start Time	End Time	Ping Test	Speed Test	Call Test	Status



Configuring test on RantCell Pro App:

User needs tap to on “Create a New Test” to run various tests individually or in combination. The tests listed are Ping test, Speed test and Call test. Following part explains how to configure these tests.

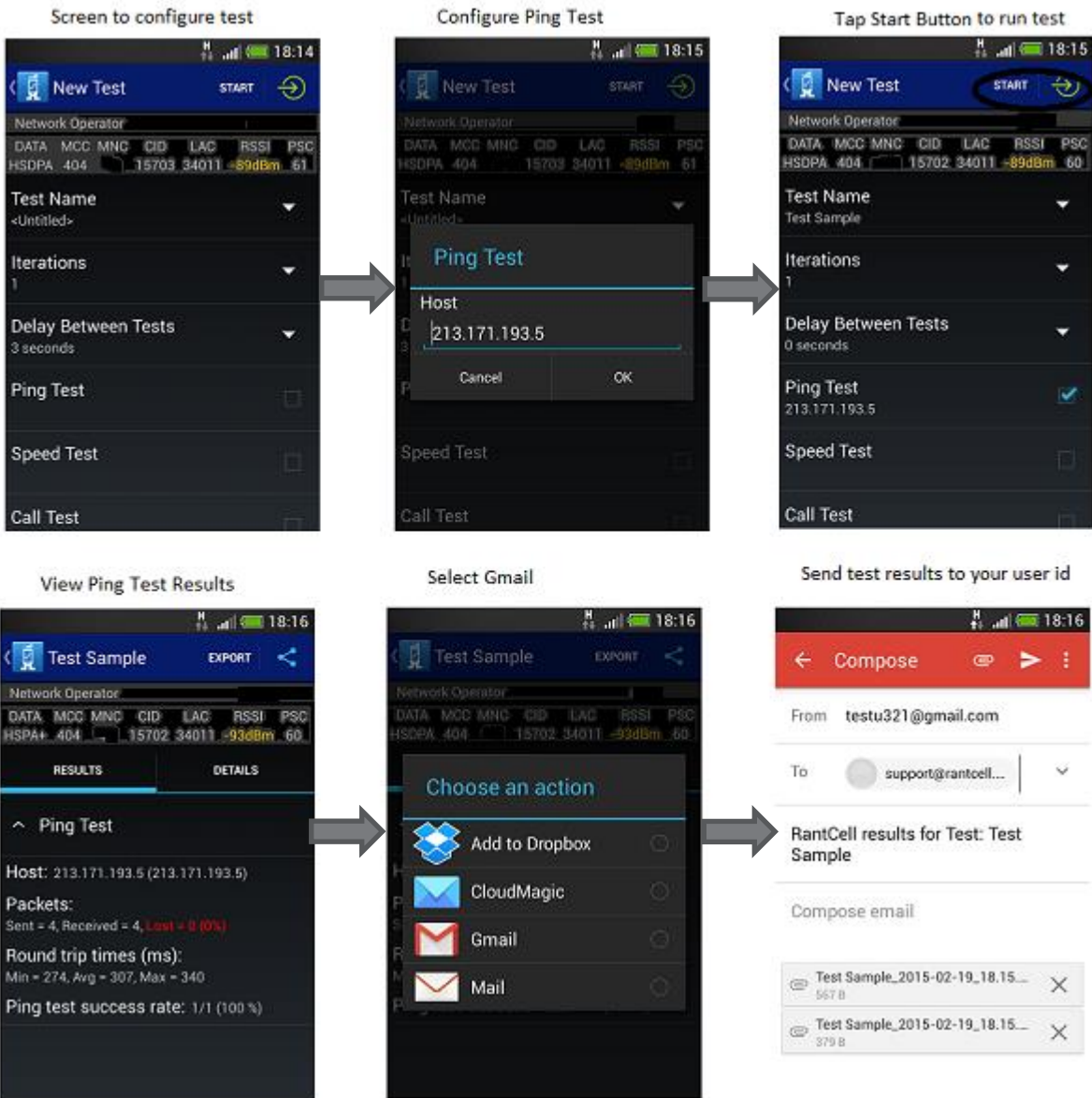
Ping Test

Ping test measurement tells how long it takes for a "packet" of data to travel from your computer to a server on the Internet and back. Whenever you experience delayed responses in Internet applications - it would be due to a higher than desired **ping**. Similar to packet loss, lower is better when it comes to **ping**. Ping test is measured in milliseconds (ms).

How to Configure Ping Test, view results and export results from app

- Select new test and enter test name ,Iterations(Number of test cycles) and “Delay Between tests”,you can change it according to your requirement.
- Configure ping test where you can change host IP Address if needed.
- Select the start test and turn on GPS which helps to know location of device.
- Check the test results and its details

Note: Once the test is completed user can login at www.rantcell.com to view the test results under this device in the dashboard.



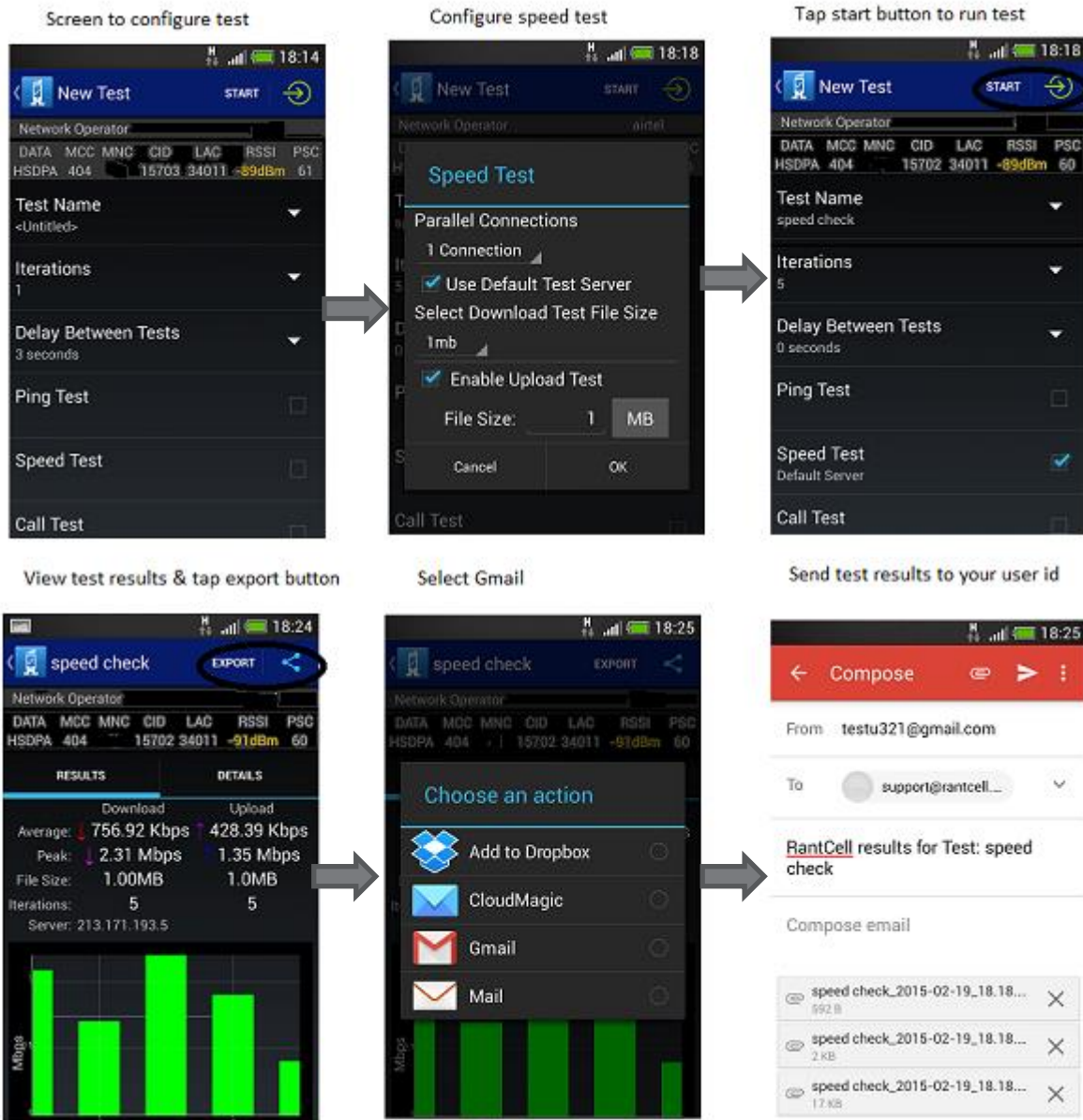


About Speed Test:

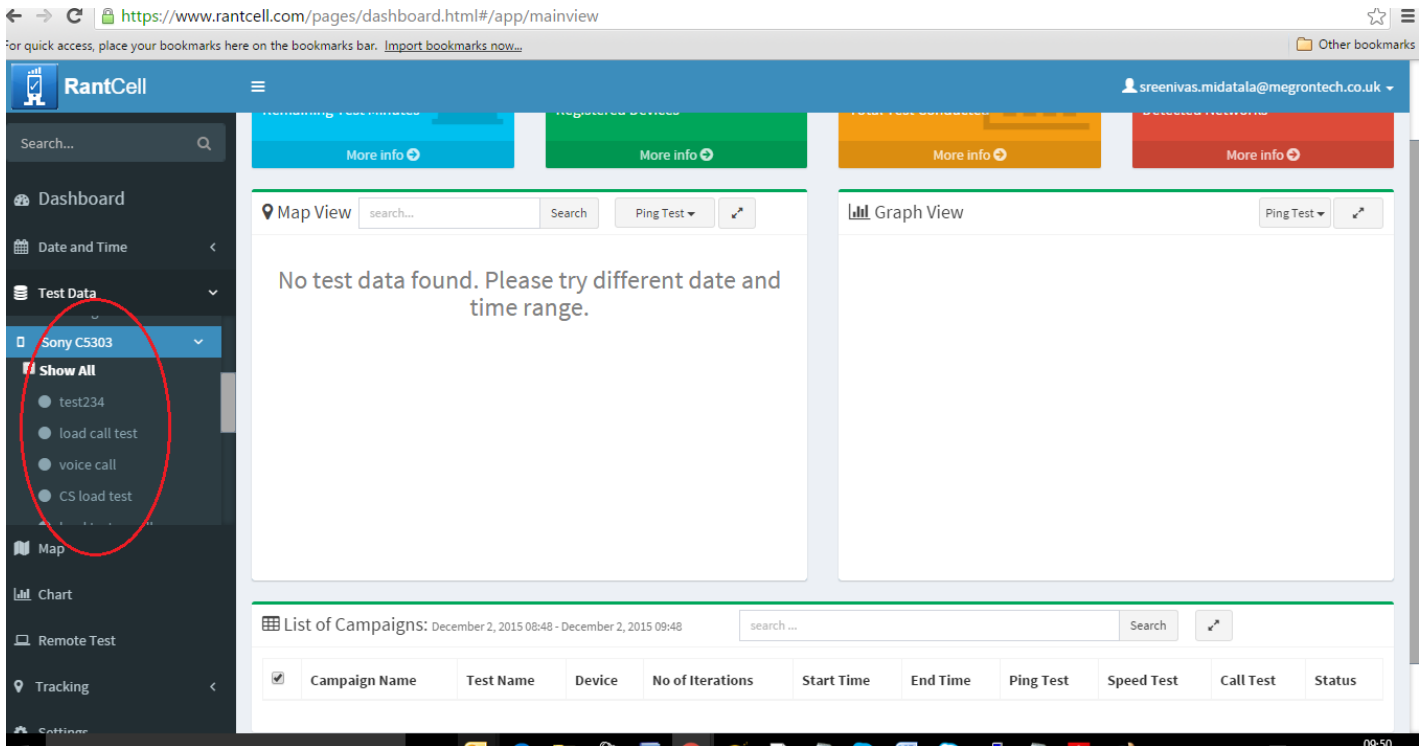
Speed Test measures your data connection speed in Mbps, meaning Megabits per Second over the mobile network .

How to configure speed test, view results and export results from the app

1. Select new test and enter test name ,Iterations(Number of test cycles) and Delay Between tests,you can change it according to your requirement.
2. Configure speed test by changing number of parallel connections, and number of iterations, enter your own FTP server if needed, alter download and upload file size (as shown below) as per the requirement which is set to 1mb by default
3. Select the start test and turn on GPS which helps to know location of device.
4. For GPS , please ensure your using “GPS only” options for highest accuracy.
5. Check the test results and its details



6. Login to the dashboard click on Test data -> Device Name -> to view the test data and load it onto the dashboard.



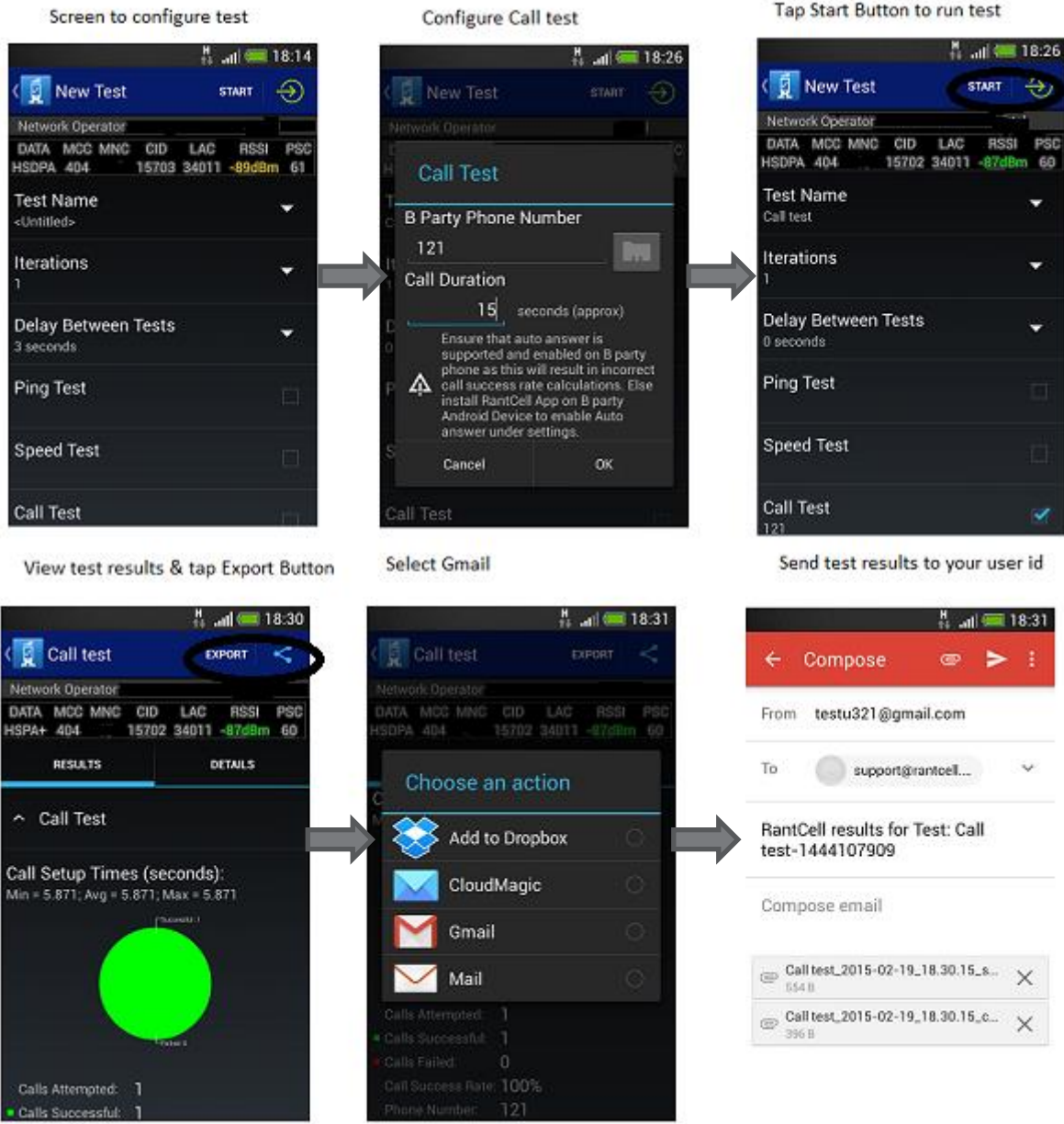
About Call Test:

Call test measures your call setup time, Dropped calls and call success rate.

How to configure call test and view results

1. Select new test and enter test name ,Iterations(Number of test cycles) and Delay Between tests,you can change it according to your requirement.
2. Configure call test by entering your B-Party number and Call duration time.
3. Select the start test and turn on GPS which helps to know location of device. (Please select “GPS only” for highest location accuracy under device settings in Android)
4. Check the test results and its details as shown in the figure below.

Note: In order to obtain accurate Call test results for calculation of call setup time the B-party phone needs to have their auto answer option enabled this can be done by installing RantCell app on the B-Party phone. Or you can choose short numbers (ex: voicemail or IVRs) as B party number.



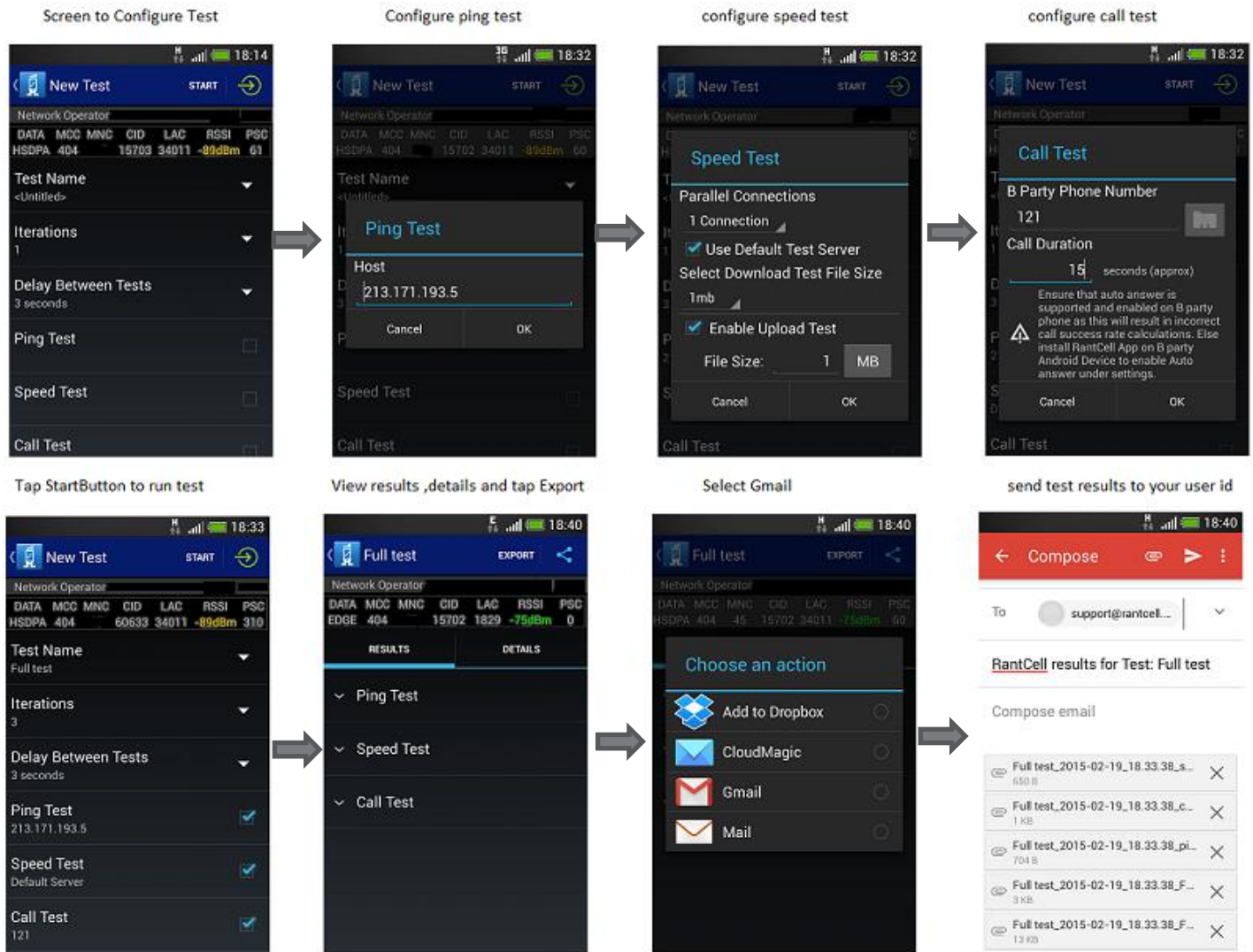


All Test:

Its possible to perform all the tests such as call test , speed test and ping test in a single campaign. Following steps explains the process to run these on RantCell Pro version.

How to configure All tests and view results

1. Select new test and enter test name ,Iterations(Number of test cycles),Delay Between tests.
2. Configure ping test where you can change host IP Address if needed.
3. Configure speed test by changing the number of parallel connections and option to enter your own FTP server if needed.
4. Configure Call test and enter your B-Party number and Time limit.
5. Select the start test and turn on GPS which helps to know location of device.
6. Check the test results and its details
7. Once the test is completed on the RantCell pro the results can also be viewed in the RantCell dashboard as explained in the previous sections.





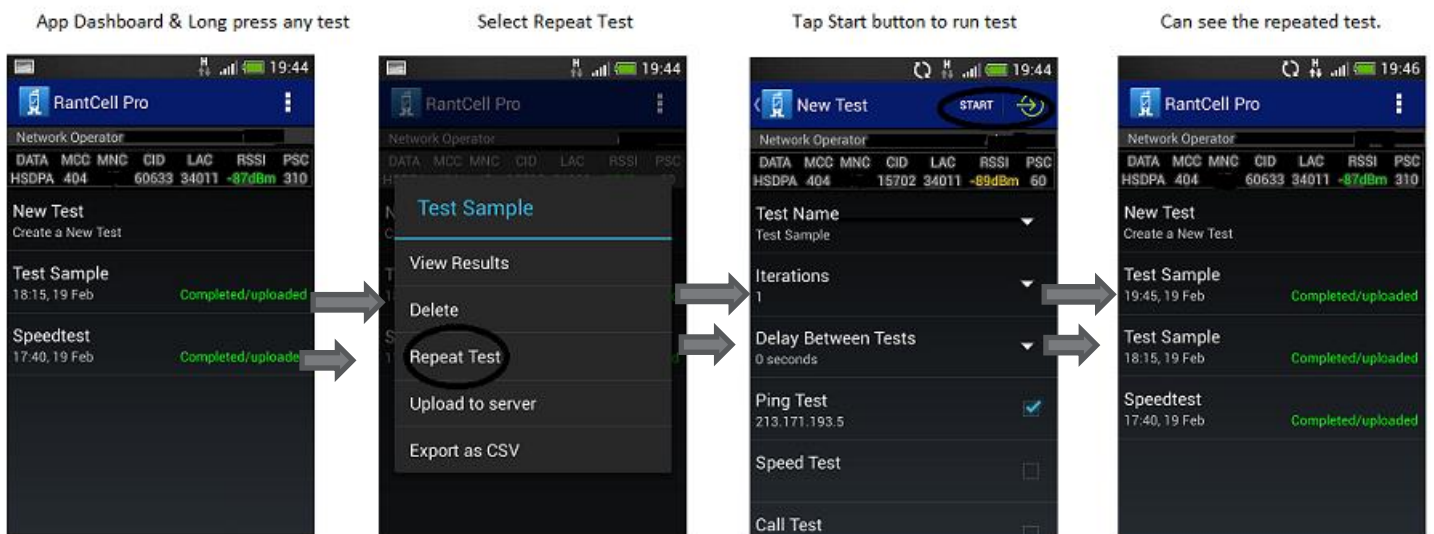
Quick Repeat Test feature on Pro app:

RantCell pro version provides a quick repeat test option for any of the previously executed tests, this will avoid entering the test configuration detail such as ftp server or ping url etc.

How to perform Repeat test on RantCell Pro app and view results

Step 1: Press and hold any previously executed test campaign until the pop up menu as shown below.

Step 2: In the pop-up menu tap Repeat Test to run the test as shown below.





Delete Test data on the RantCell Pro App

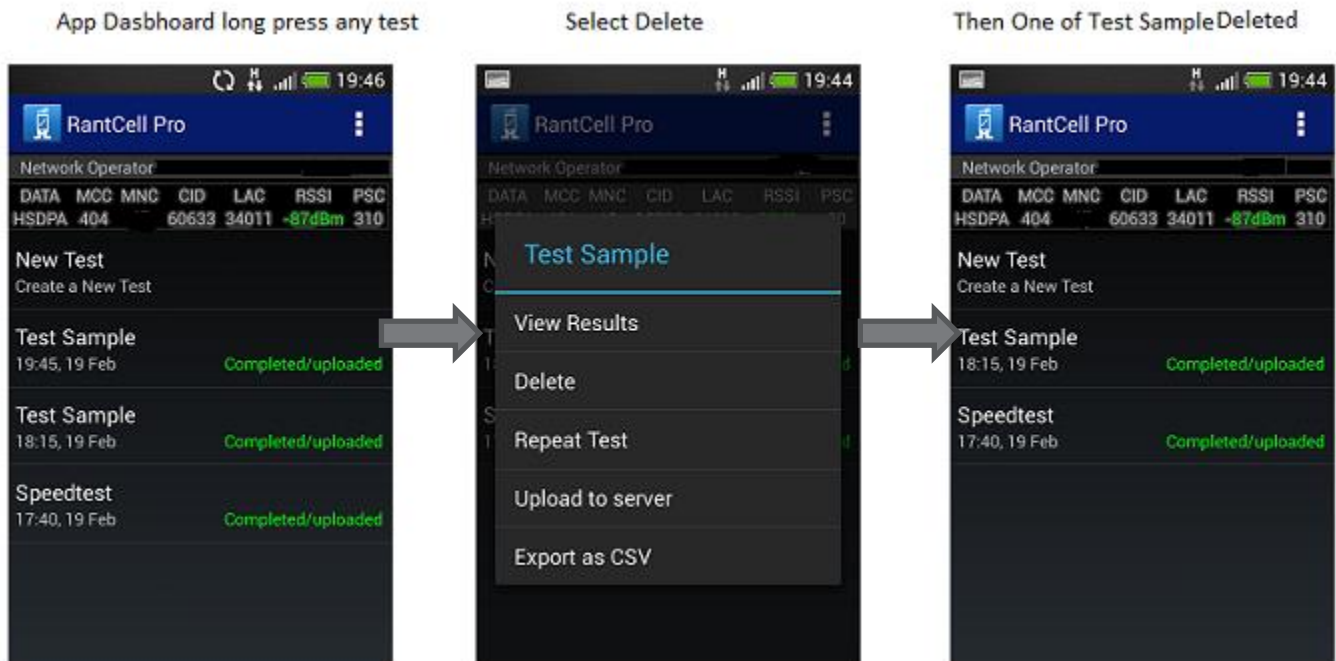
Delete test will help users to delete the test already performed on a given device individually. However please note that this will not delete the data from the RantCell Cloud server.

How to Delete test

Step 1: Press and hold any test that needs to be deleted until the pop up menu appears.

Step 2: In the pop-up menu select Delete

Steps to Delete test





Exporting test results in excel format on RantCell Pro App

Test results can be exported in excel CSV format and could be shared via email , following section explains the steps to perform export.

How to Export test results

Step 1: Press and hold any test that has been performed already until the menu pops-up.

Step 2: In the pop-up menu select Export to CSV and then Mail (or Gmail) to receive test results in mail in CSV format for analysis.

STEP 1

STEP 2

STEP 3

Exported Test Results

Timestamp	Iteration	Called	par	Call setup	Call durat	PSC	Latitude	Longitude	network	networkID	lac	cdmaRssi	cdmaEcNc	cdmaSnr	cdmaCellI	lteRup	lteRsq	lteRsr	CellID	RSSI			
2014-10-2	1	***		4.952	30	178;?;?	51.512721	-2.288396	23430	HSPA+	945	1116;617;?	?	?	?	-120	-11	?	50004	106	254	-55dB	
2014-10-2	2	***		2.94	32	252;119;11	51.511	-2.15379	23430	HSPA+	945	1116	?	?	?	-120	-11	?	14802	613	-678	6	
2014-10-2	3	***		3.966	31	243;11;11	51.51386	-2.13677	23430	HSPA+	945	1116;2143	?	?	?	-120	-11	?	22511	655	-698	6	
2014-10-2	4	***		5.944	29	243;?;?;?	51.513602	-2.136773	23430	HSPA+	945	1116;?;?;?	?	?	?	-120	-11	?	43458	?;?	-798	6	
2014-10-2	5	***		3.94	31		51.53066	-2.02166	23430	HSPA+	945	1116	?	?	?	-120	-11	?	22407	-758	6	7	
2014-10-2	6	***		3.943	31		463	51.54732	-1.95918	23430	HSPA+	945	1116	?	?	?	-120	-11	?	38716	-738	6	7
2014-10-2	7	***		3.961	31		463	51.54732	-1.95918	23430	HSPA+	945	1116	?	?	?	-120	-11	?	38716	-718	6	7
2014-10-2	8	***		3.961	31	134;77;77	51.551172	-1.867496	23430	HSPA+	945	1116;2143	?	?	?	-120	-11	?	38714	702	-798	6	
2014-10-2	9	***		23.926	13	69;97;97;6	51.546743	-1.849408	23430	HSPA		1116	?	?	?	-120	-11	?	9467	9221	-598	6	
2014-10-2	10	***		5.94	29		484	51.547200	-1.841411	23430	HSPA	1116	?	?	?	-120	-11	?	10802	-658	6	7	
2014-10-2	11	***		4.92	30	273;247;2	51.554900	-1.8122209	23430	HSPA+	945	1116	?	?	?	-120	-11	?	48721	212	-718	6	7
2014-10-2	12	***		3.872	31	273;?;?;?	51.55587	-1.79733	23430	HSPA+	945	1116;?;?;?	?	?	?	-120	-11	?	48721	?;?	-658	6	
2014-10-2	13	***		3.906	31		271	51.560418	-1.708746	23430	HSPA+	1116	?	?	?	-120	-11	?	48728	-658	6	7	

The above picture shows the format in which the data would be available when opened with MS Excel.



Settings:

Auto-Answer calls:

Auto-Answer calls is used to answer the call automatically while doing call test. Please note once enabled this will auto answer all incoming calls. This option can be enabled if the current device being used as the B party.

Enable/Disable GPS Logging:

Enable GPS is used to capture the current location of device while testing the RantCell pro application. This needs to be enabled on the Android device if the GPS needs to be logged while tests are running for example for drive testing. Its recommended to select **“GPS only”** for accurate drive test results under android settings.

Enable Share Data:

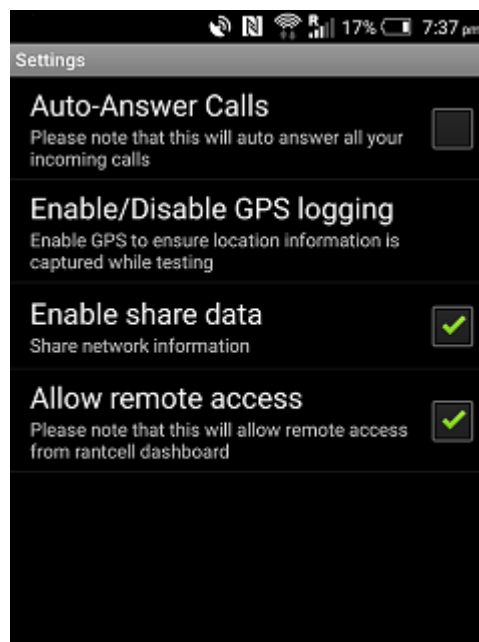
Enable share data enables real time upload of test to RantCell Cloud Analytics server . If you do not wish the data to be sent to RantCell Cloud analytics server then this option should be disabled. The data captured can be accessed by logging into RantCell.com with the registered username and password as explained in the earlier sections.

Note: If Share data is disabled no data will get transmitted from the user’s device to the RantCell Cloud Analytics and thus no data would be available for dashboard analysis.

Allow Remote Access:

This is to allow scheduling of tests on the RantCell Pro installed device remotely from RantCell Cloud server dashboard. This is specifically useful if you want to run tests on the RantCell Pro app devices where there is no physical access or located in remote location, or when you want to perform concurrent tests on many devices.

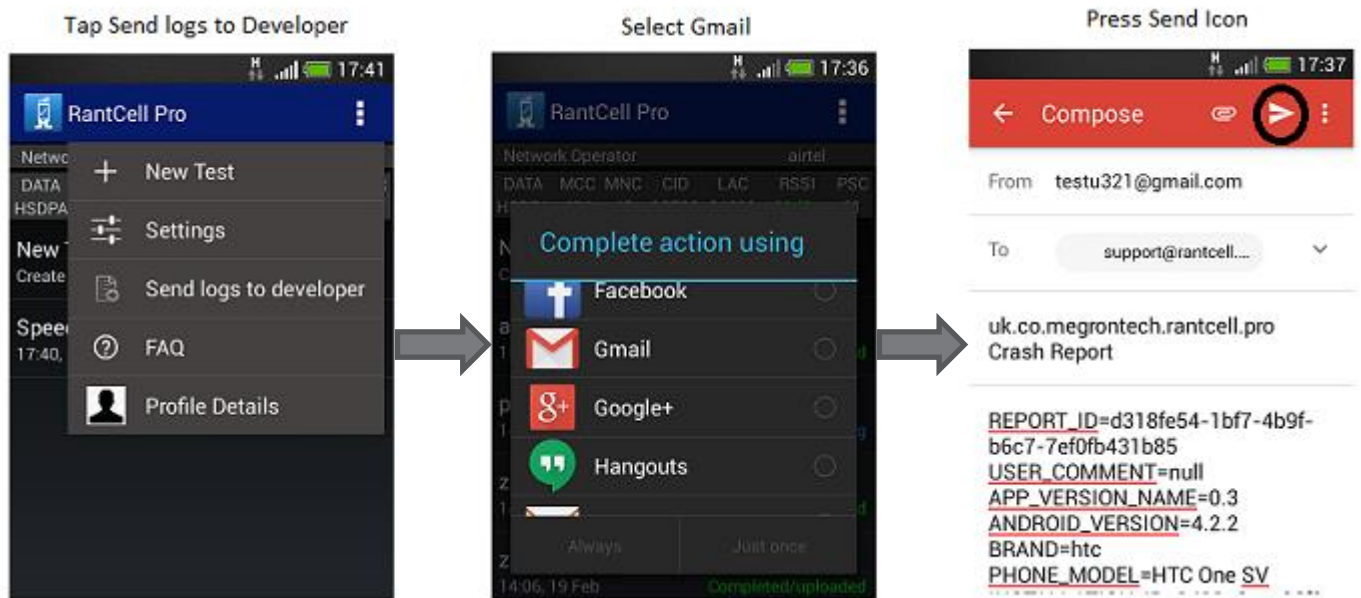
If this access disabled , the RantCell Pro app will not process any of the test requests from the RantCell Cloud dashboard.





Send Logs to Developer:

Send Logs to Developer empowers the users to contact our support team in case of any trouble or application crash via email. Select Send logs to developer from the App menu and then e-mail to send the logs to fix the issues if there are any. Users can also send their queries and suggestions via mail to support@rantcell.com





GLOSSARY:

- CID -Cell Identity
- MCC -Mobile Country Code
- MNC -Mobile Network Code
- LAC -Location Area code
- PCI -Primary Cell Identity
- PSC -Primary Scrambling Code
- RTT -Round trip-delay Time.
- UL -Uplink throughput
- DL -Downlink throughput
- RSSI -Received Signal Strength Indication
- RSRP -Reference Signal Received Power
- RSRQ -Reference Signal Received Quality
- GSM -Global System for Mobile Communication
- LTE -Long-Term Evolution
- CDMA-Code Division Multiple Access
- HSPA -High Speed Packet Access
- UMTS -Universal Mobile Telecommunications system
- HSDPA-High Speed Downlink Packet Access

Network parameters in GSM, LTE and CDMA Network

- 2G Network- GPRS, EDGE
- 3G Network- UMTS, HSDPA, HSUPA, HSPA and HSPAP
- 4G Network-LTE
- CDMA Network

GSM Phone 2G & 3G Network	GSM Phone 4G Network	CDMA Phone CDMA Network
Operator Name	Operator Name	Operator Name
Data	Data	Data
MCC	MCC	MCC
MNC	MNC	MNC
CID	CID	CDMA CID
LAC	LAC	CDMA SNR
RSSI	RSSI	CDMA RSSI
PSC	NS	NS
Latitude	Latitude	Latitude
Longitude	Longitude	Longitude
	RSRP	
	RSRQ	
	PCI	

Note:

- PSC value is available in only 3GNetwork
- PCI Value is available in only 4G Network



Appendix

MCC: Mobile Country Code which is used in wireless telephone networks (GSM, CDMA, UMTS, etc.) in order to identify the country which a mobile subscriber belongs to Example: MCC value for UK is 234 & 235. It varies depends on country.

MNC: Mobile Network Code which is in order to uniquely identify a mobile subscriber’s network the MCC is combined with a Mobile Network Code. Example for Operator British Telecom: MCC and MNC value for UK is 234 & 0

CID: Cell Identity which shows the identification number returned by the cellular base station to which the device is currently connected. Depending on the network owner the cell ID may refer to the complete base station or a specific sector on a base station. If you are conducting a survey while moving in a vehicle (e.g. car or train) the Cell ID will change as your device disassociates and associates with different base stations during the journey. This information is reported to RantCell.

LAC : Location Area Code, Each location area has unique number with network. This code is used to identify location of mobile subscriber.

PSC: Primary Scrambling code which is available only on 3G (UMTS) network.

PCI: Physical Cell Identity is mainly used by UE to decode physical layer data being transmitted by eNodeB. Cell ID in SIB1 is designed for eNodeB management within the core network, but this one is also used for UE to identify a specific cell in terms of RRC/NAS layer processing.

RSSI: Received Signal Strength Indication which is used to measure of the power level that a RF device, such as WiFi or 3G client, is receiving from the radio infrastructure at a given location and time. Usually, the higher the RSSI the better the quality and speed of the communication through the radio segment.

- **RSSI > -89dbm** **Signal quality is excellent**
- **RSSI < -90dbm & > -99dbm** **Signal quality is good**
- **RSSI < -100 dbm & > -112dbm** **Signal quality is average**
- **RSSI < -113 dbm** **Signal quality is bad**

RSRP : Reference Signal Received Power is the linear average of reference signal power (in Watts) across the specified bandwidth (in number of REs). This is the most important to measure for cell selection, reselection and handover.

- **RSRP > -89dbm** **Signal received power is excellent**
- **RSRP < -90dbm & > -99dbm** **Signal received power is good**
- **RSRP < -100 dbm & > -112dbm** **Signal received power is average**
- **RSRP < -113 dbm** **Signal received power is bad**

RSRQ: Reference Signal Received Quality is defined as $(N \times RSRP) / RSSI$, where N is the number of RBs over the measurement bandwidth. As you see from the definition of RSSI, RSSI contains all sorts of power including power from co-channel serving & non-serving cells, adjacent channel interference, thermal noise, etc.

- **RSRQ > -7 dbm** **Signal received quality is excellent**



- **RSRQ < -8 dbm &> -9 dbm** **Signal received quality is good**
- **RSRQ <-10 dbm** **Signal received quality is bad**

Network Data :which refers to 2G,3G,4G ,WiFi and CDMA network

Network Operator Name: Example : Vodafone,T-mobile etc.

Packet: A packet is the unit of data that is routed between an origin and a destination on the Internet or any other packet-switched network.

Throughput: Throughput is the amount of data that can be transferred over your Internet connection at one point in time.

Latency: that contributes to network speed.

RTT: round-trip delay time (RTD) or round-trip time (RTT) is the length of time it takes for a signal to be sent plus the length of time it takes for an acknowledgment of that signal to be received. This time delay therefore consists of the propagation times between the two points of a signal.

Downlink (DL) Throughput:

This shows the most recent download speed (in Mbps) obtained during a Throughput test. You must have a test in progress, and have selected to conduct throughput tests for this to display a metric. Downlink speed contributes to the overall performance of the connection. You can manually set the frequency of the Throughput tests when starting a test.

If user internet download speed has

- | | |
|-----------------------------------|-------------------------|
| Greater than 1.2 Mbps | Speed is good |
| Between 1.2 & 0.4 Mbps | Speed is average |
| Less than 0.4 Mbps | Speed is poor |

Uplink (UL) Throughput:

This shows the most recent upload speed (in Mbps) obtained during a Throughput test. You must have a test in progress, and have selected to conduct throughput tests for this to display a metric. Uplink speed contributes to the overall performance of the connection.

If user internet upload speed has

- | | |
|---------------------------------|-------------------------|
| Greater than 0.5 Mbps | Speed is good |
| Between 0.5 and 0.2 Mbps | Speed is average |
| Less than 0.2 Mbps | Speed is poor |

Setup time: Duration between the time user has pressed call button to time user hears the first ring from called person.

If Setup Time

- | | |
|--------------------------|--|
| Less than 4.5 | Network Connectivity is good |
| Between 4.5 and 8 | Network Connectivity is average |
| Greater than 8 | Network Connectivity is poor |