

## PROCEDURE FOR AUTOMATIC DRIVE TEST

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### ABSTRACT:

At present Drive test in GSM RF optimization is being performed manually for the improvement of performance of the network. Instead of doing Drive test manually, there may be a scope of ANMS(Automatic Network Management System) process. In this system Drive testing equipment can be attached to a moving vehicle to serve in BSNL test area and it can be monitored by the server. By using the internet all the drive data can be simultaneously collected up to date to the server.

### 1.1 RCU STRUCTURE INTRODUCTION:

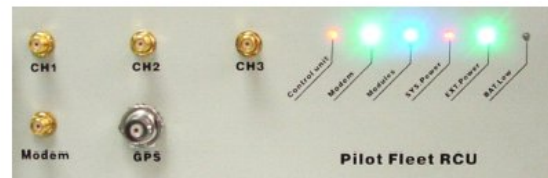


RCU Appearance

1. RCU antenna connector
2. Antenna for RCU module
3. Power button
4. working-status-indicator light

5. Power supply connector
6. Network Connection port
7. Connecting port for external test phone
8. Connecting port for external Scanner
9. Connecting port for external GPS
10. RCU GPS antenna

Status light Color



RCU status-indicator light

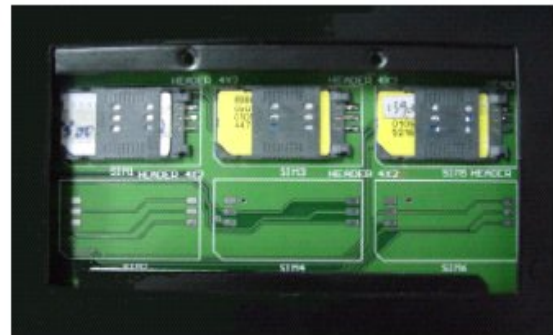
Status light	Color	Definition	Normal working state
Control unit	Red	System state	glitter
Modem	Green	Modem state	glitter
Modules	Blue	Modules test state	Light on all the time
SYS.Power	Red	System power state	Light on all the time
EXT.Power	Green	External power state	Light on when external power access in
BAT.Low	Blue	Low battery	Light on when with low battery

### 1.1 GUIDE FOR RCU INSTALLATION

#### 1.2.1 Overview on RCU installation

Generally, we place RCU on vehicle to proceed with outdoor test automatically. However, to ensure the stability of test performance, you are required to install and debug RCU before putting it into normal practice.

1. Make sure all the accessories have been well-prepared, such as GPS antenna, test module antenna, power supply cable, SIM card, UIM card and vehicle.
2. Antenna connection
3. Placing SIM/UIM card
4. Placing RCU



SIM/UIM card slot

### 1.2.2 RCU antenna installation

1. Five antenna connectors placed on the top left of RCU, the three of which marked with GPS, MODEM, GSM respectively.
2. Check if antenna connectors are all good without any block of each eyelet.
3. Insert antenna into corresponding eyelet and tighten it.
4. Make sure antenna installation are all tight joints.
5. The proper interval between antennas shall be less than 20mm.

### 1.2.3 Placing SIM/UIM card

1. Remove the slot cover at the bottom of RCU to show six SIM/UIM card slot in push-pull way.
  2. Insert SIM/UIM card into the popped card slot.
  3. Replace the popped card slot to fix SIM/UIM card successfully.
- SIM/UIM card slot

### 1.2.4 Guide for Placing RCU

1. make sure the vehicle can run well and with stable power supply of 12V.
2. Steadily Place the well-configured antenna and RCU equipped with SIM card into test vehicle to against humidity, dusty and harsh environment.
3. Attach RCU antenna to antenna bracket outside vehicle to achieve a better fix.
4. Connect power supply cable.
5. Plug power source in cigar lighter to realize power supply.
6. Switch on power supply to begin test.

## 2. RCU CLIENT

RCU Client is a type of software used to operate RCU by specific data cable. It possesses the following characteristics:

- . Check the settings of RCU test devices
- . Read, delete, save and send test data files in RCU,
- . Control RCU to stop collecting data and to reset
- . Update RCU
- . Read ESN of CDMA handset and write MIN

## 2.1 PREPARATIONS

### 2.1.1 Data transmission port

RCU is connected directly to the network card in PC using standard network wire by data transmission port.



### 2.1.2 Run RCU Client

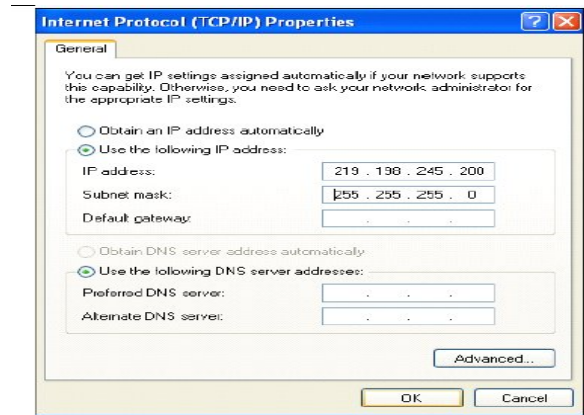
Click Start---Program File---Pilot Fleet---RCU Controller---

RCU Client to pop up the following figure.



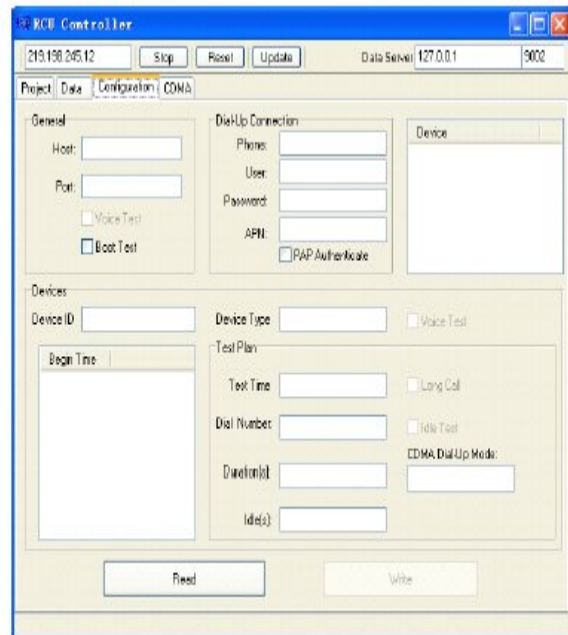
### 2.1.3 Change RCU IP

It is necessary to change RCU IP address to make communications smooth when data files are transmitted directly between RCU and PC. Go to Local Connection---Properties---Internet Protocol (TCP/IP) to open below figure. The default IP is set as 219.198.245.200 .



### 2.2 RCU CLIENT CONTROL RCU

This section is major to guide how to control RCU by using RCU Client, including stop testing, reset RCU and update RCU.



#### 2.2.1 Stop top testing

Enter the IP address of the connected RCU in the box of top left corner, then press stop to terminate testing seen in above figure.

#### 2.2.2 Rest RCU

Enter the IP address of the connected RCU in the box of top left corner, then press Reset to restart RCU.

#### 2.2.3 Update RCU

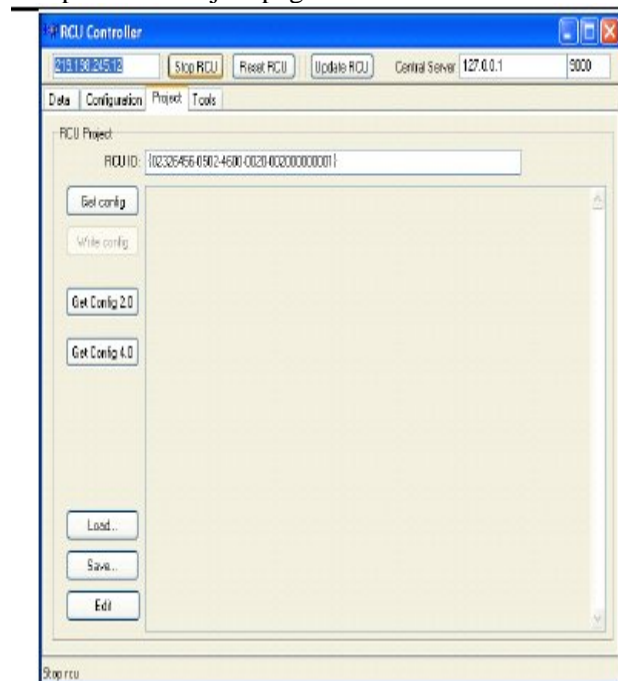
To update RCU goes to above figure, in the up left box input the IP address of connected RCU, then press Update to choose updated file in \*.upg.

### 2.3 RCU CONFIGURATIONS

In above section, operations to RCU, such as stop RCU test, reset RCU and update RCU, have been described. In this section we will guide you how to read and write RCU configurations, upload and download data files, get and write configurations and read the ESN of the CDMA handset and write MIN.

#### 2.3.1 Project

The view and maintenance of server will be completed in Project page



RCU ID	The current RCU ID which is identical with that in project file in server
Get Config	Click it to get configurations file for current RCU ID from server
Write Config	Write new configurations file to the current RCU configurations
Load	Import RCU configurations file
Save	Save the Get RCU configurations file
clear	Remove the content of current configurations file

The operations to the configurations files are followed the below steps:

Step1: enter server IP and corresponding port in Date Server in top right of above figure

Step2: ensure the connection between PC and server is OK.,

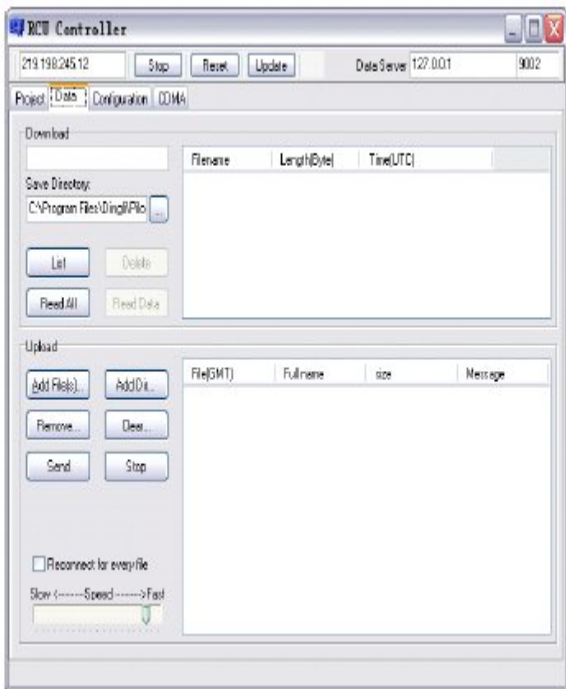
Step3: type the required RCU ID in RCU ID box

Step4: click Get to show the configurations file in right box

Step5: click Load to import new configurations and click Save to store the current configurations to the appointed RCU.

#### 2.3.2Data

The following is the Data figure. You can view all test data files in RCU, and unnecessary data files are available to be deleted so as to save the free space. Furthermore, test data files are able to be stored to hard disk of local PC. In case data files can not be transmitted because of the network trouble, a storage path is set to store the data file, and latter data files are uploaded to other appointed server.



Download	Filename	The compressed original file name in RCU
	Length(Byte)	The size of original file
	Time(UTC)	The time to generate the original file
	Save Directory	The path to store the compressed original data file in RCU
	List	List all original files in RCU
	Delete	Remove the selected original files from RCU
	Read All	Read all original data files to the appointed path
	Read Data	Read the selected original data file to the appointed path.
	File(GMT)	The original file name after uploaded and decompressed. it is named as the current time in .msg

Upload	Full name	The compressed original data file name before uploading (.rcu)
	Size	The size of the original data file
	Message	The state during uploading: Sending, OK, skip and Error
	Add file(s)	Add the original data files required to upload (.rcu)
	Add Dir	Add the file folder which the original data files are stored
	Remove	Remove the selected original data file
	Clear	Remove all original data files
	Stop	Stop uploading original data files
	Send	Upload original data files to server
	Reconnect for every file	Upload data files again. If click it, first software will check each data file, in case one data file has been transmitted completely, the file will be skipped, or else it will be uploaded continuously.
Speed	Adjust the upload speed.	

**Download**

Please follow the below steps if you want to edit or read the data files in RCU.

Step1: enter RCU IP: 219.198.245.12 in top left and change PC IP to 219.198.245.200.

Step2 connect RCU and PC using standard network wire.

Step3 press List to show all data files in RCU in right box, including file name, length, and time.

Step4 click Read All to store all data files in RCU to the appointed path.

Step5 click Delete to remove the data files in RCU Upload



Please follow the below steps to upload data files to server from PC.

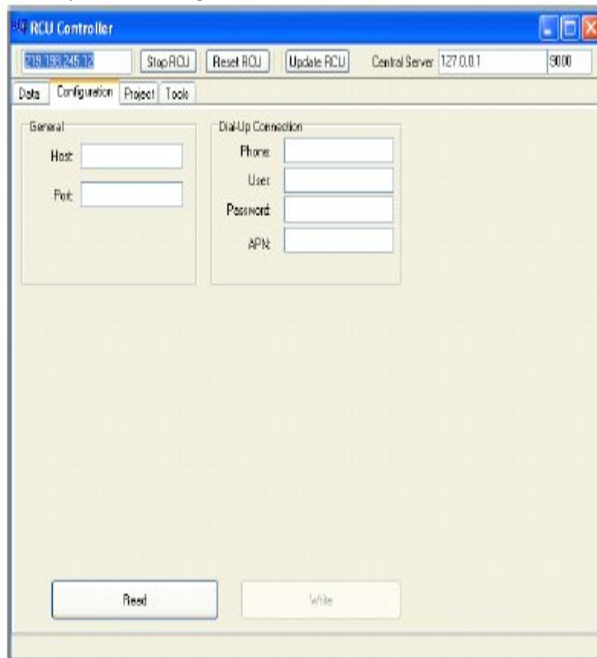
Step1 enter server IP and corresponding port which is used to receive data file in Data Server.

Step2 connect PC to internet and ensure the normal communications.

Step3 click Add File or Add Dir to add uploaded data files

### 2.3.3 Configuration

This section provides the functions to view and modify the configurations file in RCU.



General	Host	The data server IP address
	Port	The corresponding port
Dial-up Connection	Phone	The dial-up number
	User	The dial-up user name
	Password	The password of dial-up user
	APN	The APN for data call
Read	Click it to read the configurations file in RCU	
Write	Click it to write the modified configurations to the configurations file in RCU	

### 2.3.4 CDMA

The major functions in this section are to read ESN of CDMA handset and write MIN. The following is the figure



ESN	The number used to mark the mobile device only
MIN	The identifier of mobile device

#### Read ESN

Click Read ESN to show the ESN of CDMA handset in the left box in the state that test stops

#### Write MIN

First write the MIN in the left box and then press Write MIN.

## 3. TROUBLE SHOOTING

### 3.1 RCU PROBLEMS

1. Operator name: Each RCU channel is assigned an operator name in the test plan, and the operator name is added to the test data during decompression after receipt from the RCU. It is essential that the names correlate prior to data collection otherwise the statistics calculations will be invalid Modification of any Test Plan does not require the restarting of any related service.

If the Phone Numbers and Service Provider are changed in the RCU Information, all Fleet service must be stopped and restarted. Other changes to RCU settings, including modifications to test plans, do not require service restart.

2. The RCU Device Model name defined in the RCU Information is an identifier for decoding. Subsequent changes will cause problem in RCU data collection.

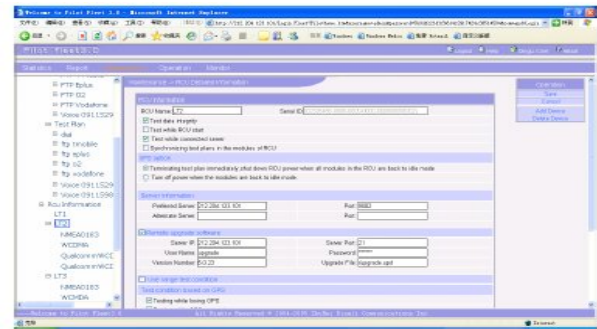
a) If an error occurs in an RCU connection with a server (e.g. the wrong IP or dial phone number is configured in the RCU), an SMS with the correct information can be sent to the RCU modem to correct the setting. SMS information may change one or multiple items each separated by the Enter (Return) symbol. Setup corrections are defined below:

- A) IP address
- B) Port number
- C) APN information
- D) Dial phone number
- E) User name
- F) Password
- G) 1 | 0 indicates the PAP dial mode

3. If an RCU is seen, or suspected, to be malfunctioning when examining data on the Web Client, (eg no data upload, showing offline, frequent disconnects), follow the recommendations listed below:

- a) Logon to Fleet Web Client
- b) Click on Operation page.RCU, select problem RCU, click Restart RCU
- c) If resetting RCU remotely fails, then turn-off RCU power supply, wait for 3-5 minutes and turn-on RCU again.
- d) If RCU is still not working after b) and c), the next step is to stop all Fleet services on the Central server, then restart them again.
- e) If d) fails it is recommended to restart the Data Server PC server.

4. Upgrade RCU Log on to Fleet Web Client' Maintenance .RCU Information.select the RCU to be upgraded.

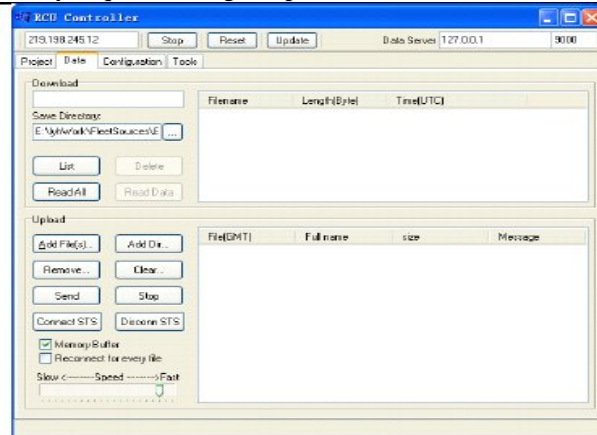


Check the box labelled “Remote upgrade software”, and fill in all related server information. The RCU will download the upgrade software through FTP PASV download.

1. Direct connect transfer of RCU test data can be implemented as follows:

- A) Connect the RCU and computer using an RCU connect internet cable (Ethernet crossover)
- B) Assign computer IP address as 219.198.245.10
- C) Turn-on the RCU, Run RCUClient software on the computer, select Data TAB and click on the List button to display the list of data files in the RCU. Select the data files to be downloaded, then click Read Data button (Read all for downloading all data files).

Note: The downloading process may take few minutes, the software application will not respond to any request during the period



D) Disconnect the RCU, Turn-off RCU power (RCU may be activated to upload data to data server by RCU client software through the computer LAN connection)

E) The next step is to transfer RCU data from the local computer to data server. In RCU client –Data page, click Add Files/Add Dir in Upload

section to select files to transfer (the saved RCU file is located in Save Directory in Download section), then click on Send button, the files listed in Upload section will be sent in order. Note: RCU client will read the existing files in the Data Server and will not send duplicates.

a) The send speed is adjustable, if the server is not busy, faster sending speed may be selected. If the server is busy with other tasks, it is recommended to select slower sending speed in order for the server to better serving other active RCU.

### 3.2 PESQ PROBLEMS

#### 3.2.1 No Voice quality (PESQ) scores (uplink):

Check if the caller phone number is correct (the caller ID display function can be ordered from the telephone provider), the caller number needs to be matched with the number specified in the RCU device page. After correction of the caller number, all Fleet services must be restarted.

#### ABOUT THE AUTHOR:

I am **V.S.PAVAN KUMAR** pursuing M.Tech in communication systems in S.V.University, tirupati. I am greatly indebted to our **Sri Venkateswara University** that has provided us a healthy environment to drive us to achieve our goals and ambitions.

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V.S.Pavan Kumar

