



**MOTOROLA**

# **RadioComm User Manual**

**Platform Development Operations Group (PDO)**

**Version 3.6**

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**Abstract:** This document provides an overview of the RadioComm software application. RadioComm is a manual test tool, which provides an easy to use GUI interface to the available test commands for a given product plus additional user convenience features. RadioComm currently supports CDMA P2K, CDMA1X, GSM (P2K and forward), TDMA (P2K and forward), and 3G products.

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## Revision History

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# 1 Introduction

## 1.1 Purpose

This document provides a general overview of the RadioComm test software. It will describe general setup and a description of the features for the different MAs on the various tabs within the application.

## 1.2 Scope

The RadioComm User Manual applies to CDMA P2K, CDMA1X, GSM (P2K and forward), TDMA (P2K and forward) and 3G products. The target audience includes anyone needing to communicate via test commands to a Motorola cellular phone.

## 1.3 Objectives

The objective of the RadioComm User Manual is to provide a general understanding on how the software works. After reading this document, the user should be able to navigate through the application and understand the basic features and how they work. The user, however, will need to have an understanding on how the actual phone works in order to use the software efficiently.

## 1.4 Overview of RadioComm and this user manual

RadioComm is graphical interface to the numerous test commands available for various Motorola cellular products. It contains an easy to use interface to the test commands, which would otherwise be very difficult to execute based on the number of options and protocol. The command data strings required to be sent to the phone for a given test command are formatted in the background so the user does not have to have knowledge of the test command format or protocol. RadioComm also contains user definable test scripts and many other features which make communicating to the phones much easier. The software is designed with the development engineer and cellular technicians in mind. This manual will describe the features of RadioComm and provide general setup information. For specific information on a given product, the user should consult that product's specific documentation, such as the Manufacturing 12M and Test Commands Document.

## 1.5 Table of Definitions

Acronym	Definition
MA	Major Architecture (i.e. CDMA, CDMA1X, GSM, TDMA, 3G)
PTEG	Product Test Engineering Group

## 1.6 References

Platform 2000 Test Command Specifications (CONN-TCMD-SIS-2329)

CDMA Platform 2000 Reference Architecture 12M (1209183A45)

CDMA 2000 Reference Architecture 12M (1209189A92)

GSM Platform 2000 Reference Architecture 12M (1209190A16)

TDMA P2K 12M (1209188A5)

## 2 General Information

### 2.1 Web Site

The latest version of RadioComm can be downloaded from the Motorola internal web site:  
<http://compass.mot.com/go/radiocomm>. Access will be required to view the website and download the application. Follow the instructions on the web page listing regarding contact information in order to get access to the site.

### 2.2 Installing RadioComm

Installing RadioComm is very simple. You can either run the install program when clicking on the file from the compass web site or double click on the install file, wherever you have placed it, and follow the on screen directions as you would installing any other program.

### 2.3 Running RadioComm

RadioComm should be installed as a registered program on your PC. Therefore, start RadioComm as any other Windows application from your Start → Programs menu or by double clicking on the provided desktop icon.

The first time RadioComm runs on a PC, it will prompt you to select two things. First select the MA that you would like to use. Second, select the communication mode you would like to use. After this first time, the last technology and communication mode used, along with other various settings, will be remembered and automatically defaulted when you launch RadioComm.



After selecting the desired technology, the specific screens for that technology will appear and you are ready to begin using RadioComm.

## 2.4 Menus

### 2.4.1 Main Menu

#### MA

MA allows the selection of the technology. Current supported technologies are CDMA, GSM, 3GSM, TDMA, CDMA1X – 5105/5100 Chipset, CDMA1X – 5105/5100 Chipset IDEN, CDMA1X – 6050 Chipset, CDMA1X – 6100 Chipset, CDMA1X – 6300 Chipset, CDMA1X – 6500 Chipset, CDMA1X – 6x50 Chipset and 3G. Selecting the technology will display the screens and features available for that technology.

#### Exit

Exits the RadioComm application.

### 2.4.2 Settings Menu

#### RS232

Selects RS232 as the communication protocol. The last used COM port will be opened by default.

#### USB

This sub-menu allows the user to select if they want to use the GNPO, PST SDK or MLink driver for USB communication. All selections close the open COM port (if applicable), then starts the selected USB communication driver. Typically, phones will be auto-detected and enumerate once detected. A visible red, green, blue or magenta prompt will be displayed in the upper right corner of RadioComm, with red meaning not enumerated, green meaning enumerated in P2K command mode, blue meaning enumerated as a Motorola Modem and magenta meaning enumerated as a BLAN socket connection. If a phone does not auto enumerate, try unplugging and then re-plugging in the phone. The first time a new phone is detected, Windows wizards will come up asking the user where the USB driver is located. Assuming RadioComm was installed in the default location, Browse to the C:\Program Files\RadioComm directory and choose the p2k.inf file.

#### TCPIP

This sub-menu allows the user to select if they want to use the GNPO, PST SDK or MLink driver for BLAN communication. All selections close the open COM port (if applicable), then starts the selected BLAN communication driver. Typically, phones will be auto-detected and enumerate once detected. A visible red, green, blue or magenta prompt will be displayed in the upper right corner of RadioComm, with red meaning not enumerated, green meaning enumerated in P2K command mode, blue meaning enumerated as a Motorola Modem and magenta meaning enumerated as a BLAN socket connection. If a phone does not auto enumerate, try unplugging and then re-plugging in the phone. The first time a new phone is detected, Windows wizards will come up asking the user where the USB driver is located. Assuming RadioComm was installed in the default location, Browse to the C:\Program Files\RadioComm directory and choose the p2k.inf file. Under this selection you can also choose the system simulator mode (GNPO Driver Only). This closes the open COM port (if applicable) the initiates a socket connection with the IP and Port that was either entered under the TCPIP Settings menu or retained in registry from the last setting. This setting is used to communicate with a phone using network sockets and does not require the phone to enumerate to work. This setting is used by the system simulator people.

#### RS232 Settings

Numerous sub-menus appear under RS232 Settings. This menu and its sub-menus are only enables when RS232 has been selected as the communication protocol.

Sub-menus under RS232 Settings:

##### Select COM Port

Allows the user to select COM1, COM2, COM3, COM4, or close the current open COM port

##### Desired P2K Baud Rate

Allows the user to select the desired baud rate for P2K mode of Qualcomm based phones. This menu item will be disabled on all non-CDMA1X MAs. Selecting a baud rate will be invoked when the user resets/recycles their phone and presses the AT+MODE command button on the CDMA1X header. The user's PC will be set to the Default Radio Baud Rate so that the PC matches the radios baud rate. If 115200 is selected, the correct AT command will be sent to the phone to set it to 115200 baud. The user's PC will then be set to 115200 and the AT+MODE=1 command will then be sent.

#### Desired QC Baud Rate

Allows the user to select the desired baud rate for Qualcomm modes (PhoneT, Diag) of Qualcomm based phones. This menu item will be disabled on all non-CDMA1X MAs. Selecting a baud rate will be invoked when the user resets/recycles their phone and presses the IsOnline or SetMode functions. The SetBaudRate command will be sent and the user's PC will then be set to the desired baud rate.

#### Default Radio Baud Rate At Power Up

Allows the user to select the radios default baud rate at power up. This menu item will be disabled on all non-CDMA1X MAs. Selecting this baud rate allows us to properly communicate with the phone when the user presses the AT+MODE or IsOnline buttons. If this selection is set to 115200, then the Desired P2K Baud Rate will also be forced to 115200 as well.

#### Force COM Port Baud Rate

In the event the phone and PC baud rates become mismatched, a user can manually select a baud rate. This will force the user's PC to the selected baud rate. This feature should only be used by the advanced user. It is recommended to just simply power cycle or reset your radio and allow RadioComm to auto-baud to your desired baud rate.

### USB Settings

This sub-menu will only be available if the GNPO USB driver has been selected as the communication protocol.

Sub-menus under USB Settings:

#### Enable Virtual Port

This enables the ability to communicate with a radio when it is enumerated as modem over a virtual com port. This is handy in development stages when the radio software does not support changing the mode of the radio to Composite device or if the PID's and VID's do not match. You will be prompted to enter the virtual port number when selecting this option.

#### Disable Virtual Port

This allows the user to disable the virtual com port communication mode. This returns the USB driver to normal mode of operation. The enable virtual port selection must have been selected prior to this option being available.

#### Set Virtual Port

This allows a user to change the virtual com port number if so desired to. The enable virtual port selection must have been selected prior to this option being available.

### TCPIP Settings

This sub-menu will only be available if either TCPIP (GNPO Driver Only) or TCPIP/System Simulator has been selected as the communication protocol.

Sub-menus under TCPIP Settings:

#### Set IP and Port

This allows the user to specify the desired IP address and Port number to use for the network sockets communication mode.

### Test Command Timeout

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Allows the user to select the amount of time the receive buffer will be polled when looking for a command response back from the radio. Some phones/commands take longer than others so users may want to increase the timeout in order to avoid getting command failures. Several pre-defined timeouts are listed plus the user can select 'User Def' and enter the desired timeout in seconds. Once this is set, the entered time will be displayed next to 'User Def'.

#### FSAC 'Clear All Files' Timeout

This is a unique timeout that only sets the max timeout for the FSAC test command when used to clear out the file system of the phone. So only the FSAC parameter to clear all files is affected. All other FSAC uses will fall under the normal Command Timeout setting.

#### Test Command Retries

This setting allows the user to select how many times the test command being sent will be re-sent upon a failure. This will only re-send a test command on a failure.

#### Test Command Format

This setting allows the user to select the correct test command format. Choices are either P2K or P2K05.

#### Port Polling

This allows you to poll the selected communication port for unsolicited responses from the phone. Any data returned from the radio will be displayed in the test command status window in the upper right corner. This selection will currently not work when the PST driver is selected.

#### Test Command Logging to File

This selection allows a user to log all steps in sending and receiving test commands to a log file on the local hard drive. If selected, test command details will be logged to either PhoneCommLogP2K.txt or PhoneCommLogQC.txt depending on what type of test commands are being used. The files will be in the directory where RadioComm is installed.

#### Toggle On/Off Line

This toggles the DTR line of the PC's serial port. If using an interface device such as the Junior Board, the Junior Board will translate the toggling of the DTR line as toggling the On/Off line of the radio.



### 2.4.3 Features Menu

This menu contains numerous items which are common between all or multiple MAs.

#### Flash

This will bring up the Flash form. It allows the user to flash software into a radio. There is no intelligence built into this flashing routine so take caution and ensure you are trying to flash the correct software into a given phone. See the appropriate section in Section 3 for complete details.

#### NV / SEEM

This will bring up the NV / SEEM form. It allows the user to read the SEEM from the radio and to write the SEEM into the radio via test commands. See the appropriate section in Section 3 for complete details.

#### Radio Backup/Restore

This will bring up the Backup/Restore form. This form is nearly identical to the NV/SEEM form, except this form is solely intended for CDMA1X phones only and only communicated in QC test commands. See the appropriate section in Section 3 for complete details.

#### Run Test Command Script

This will bring up the Run Test Command Script form. It allows users to run previously saved test command scripts with some options. See the appropriate section in Section 3 for complete details.

### 2.4.4 Common Applications Menu

This menu contains numerous items which are common between all or multiple MAs. The items in this menu are dynamically populated based on the presence of the DLLs. Each version of RadioComm may have different items in this list so details about each item are not in this manual.

If you wish to write your own application that is launchable from RadioComm, you can follow the guidelines for a PAL application. This allows flexibility in that you can design your own GUI to do something, and rely on the communication link to the radio to be handled by RadioComm. Complete documentation and sample code can be found at: <http://compass.mot.com/go/ptegpal>.

### 2.4.5 Help Menu

#### User Manual

Selecting this will open the RadioComm User Manual, which is in .pdf format. The user's PC must have a program associated with .pdf files in order to automatically open the manual.

#### Release Notes

Selecting this will open up the RadioComm Release notes, which is in a text file format.

#### About

Selecting this will open the 'About' screen, displaying various RadioComm information.

## 2.5 General Phone Setup

RadioComm supports both RS232 and USB communication to/from the phone.

### 2.5.1 RS232 Requirements and Setup

#### Requirements

- Either COM Port 1, 2, 3, or 4 must be available on your PC.
- A serial data cable. This may be a cable that connects directly from the COM port to the phone or a normal serial cable that connects to an interface device, such as a Junior Board. If an interface device such as a Junior Board is used, a second cable connecting from the Junior Board to the accessory connector of the phone is also needed.
- A working phone that supports RS232 communication.

#### Phone Setup

- Connect the phone to data serial cable, either directly or through an interface.
- Power up phone to the nominal voltage level specified for the phone. Note: certain phones may be required to be powered from the battery contacts due to current drain limitations.
- Select RS232 from the Settings Menu
- Select the desired COM port from the Settings Menu
- Press the desired test command. Note that different phones require different initial test command sequences to properly communicate.

### 2.5.2 USB Requirements and Setup

#### Requirements

- A USB port must be available on your PC.
- A USB data cable. This may be a cable that connects directly from the USB port to the phone or a normal USB cable that connects to an interface device, such as a Junior Board. If an interface device such as a Junior Board is used, a second cable connecting from the Junior Board to the accessory connector of the phone is also needed.
- A working phone that supports USB communication.

#### Phone Setup

- Select USB from the Settings Menu
- Connect the phone to the USB cable, either directly or through an interface.
- Power up phone to the nominal voltage level specified for the specific phone. Note: certain phones may be required to be powered from the battery contacts due to current drain limitations.
- The phone should be detected automatically. If the USB indicator is still red, try unplugging the phone and re-plugging it in. For phones being enumerated over USB for the first time, a Windows Wizard may appear asking for the location for the USB driver. Browse for the file – it should be located in your C:\Program Files\RadioComm directory, assuming you installed RadioComm into the default location.
- If RadioComm recognized the phone and initialized successfully, you may execute the other test commands. Note that some test commands may only be performed while the phone is in a certain mode. As the user, you should be familiar with what each test command does. For more specific information on a test command, refer to the test commands document for the given product.

### 2.5.3 Command Details

RadioComm is setup to send and receive test commands based on the Test Commands Document for the given products. All details about the commands can be found in the associated products Test Command Document. This user manual is for specific RadioComm help and help for features included in RadioComm.

RadioComm will show either a Red or Green background in the test command status window in the upper right hand corner to let you know when the executed command either fails or passes. However, depending on the command, the screen may turn green but the test command itself is a failure. This is because the Red/Green is based on whether the test command itself was formatted properly and a response was received from the radio. There are cases where the data coming back in the test command response is what determines if the command was successful or not. In these cases, we try to make the buttons in RC turn red or green. So if you see the header window showing green, this may not mean that the command was completely successful in all cases. The test command document will give details on those commands that do send back status or success data bytes as part of the command response.

### 2.5.4 Radio Modes

There are several different modes that the phone has and in each mode, the radio can act differently and accept different commands. The test command document will tell you if the commands that you want to send need the radio in a specific mode.

- 1) ATMODE. This is the base mode to communicate with a phone using Motorola test commands. If using RS232 communication, all you have to do to get into this mode is power up the radio and hit the ATMODE button in the header area of the screen. If using USB, then there is no need to hit this buttons as ATMODE is the default at power up.
- 2) SUSPEND. To put the radio into P2K suspend mode, simply press the SUSPEND button, no matter what type of communication you are using.
- 3) Diag. This mode applies only to CDMA1X, Qualcomm chipset based phones. This is a similar mode to ATMODE but no matter what communication method you use, you must hit Diag mode after powering the phone up to communicate with the radio.
- 4) FTM. This mode applies only to CDMA1X, Qualcomm chipset based phones. This is a similar mode to SUSPEND for P2K commands except this is the mode that all phasing is performed in for 6xxx based phones.
- 5) PhoneT. This mode applies only to CDMA1X, Qualcomm chipset based phones. This is a similar mode to SUSPEND for P2K commands except this is the mode that all phasing is performed in for 5x00 based phones.

## 3 Common Features

### 3.1 Custom Buttons Entry

The custom buttons entry allows users to link previously saved test command scripts to hot buttons. This is a convenient method of executing frequently used test scripts. To get to the custom buttons entry screen, press the 'Setup Buttons' button on the top right of the screen.

Process to associate a script with a button:

- 1) Select one of the hot buttons on the left that you would like to setup.
- 2) Click the Browse button and locate the script you want to associate with this hot button.
- 3) Type in a name for your new custom button, this name will appear as the button label when setup is complete.
- 4) Select whether the selected test command script is a Motorola type command script or a Qualcomm type script. Motorola is the default.
- 5) To aid in grouping buttons, the user can select a color that will be used as the button background. The default is the gray color of all buttons in RadioComm. If desired, select a different color.
- 6) Press the 'Set' button.
- 7) The button is now configured and will be retained so that even upon exiting RadioComm and re-starting, it will be remembered.
- 8) If you wish to clear a previously defined hot button, select the desired button to be cleared and press the 'Clear' button.
- 9) A 'Clear All' button is provided to return all the buttons to their default, unused state.
- 10) Click on the X in the upper right corner of the custom buttons entry window to exit the setup form.
- 11) When exiting, the buttons on the right side in RadioComm will be redrawn with the settings you just defined.

## 3.2 P2K Command Calculator

The P2K Command Calculator allows you to formulate the correct data string for a test command in either RS232 or USB format for either P2K or P2K05 test command format.

You can get to the command calculator screen by pressing the 'Calculate New Command' button under the Send Raw Test Command frame on any of these tabs: CDMA 2, GSM 2, TDMA 2, P2K 3 (CDMA1X MA's only) or 3G 6.

To create a command:

- 1) Enter the op-code in the OpCode window.
- 2) Enter the number of data bytes you will be sending with the command.
- 3) Press the 'Set' button.
- 4) Based on the number of data bytes you entered, the same number of data cells will appear in the middle section of the window. The default value in each cell will be 0x00. Double-click on a cell to enter edit mode. Change the data byte to a new value if desired.
- 5) Instead of entering the data byte by byte, you can also place all the data you wish to send in the box towards the bottom of the screen. The data in the grids, listed byte by byte, will be ignored if data is in this box.
- 6) When done entering the data bytes, select either RS232 Format or USB Format. If the command format is set to P2K05, then since there is no RS232 data format for P2K05, this selection will be removed.
- 7) Press the 'Calculate' button.
- 8) The data string will be shown in the Complete Data String window. If you check the checkbox, it will automatically copy the data into the To Radio text box in the Send Raw Test Command frame you are working on. If you don't check it, you will have to manually copy that string into the To Radio window of the original Send Raw Test Command frame.

### 3.3 NV / SEEM

The NV / SEEM form allows users to read/write the radios NV / SEEM from/to the phone. It also allows the users to save that information and recall it at a later time. User entry is allowed to change the NV / SEEM to whatever the user would like.

Check the checkbox if you would like AT+MODE=1 to be sent to the radio first, such as if this is done immediately after a power-up. If checked, this will also send the RESTART command when finished reading/writing the SEEM elements. For CDMA1X products, the phone cannot be in PhoneT mode.

**Select Product:** Use the pull-down selection box and choose the desired product from the list.

**Action:** Press *Read* to read out the SEEM elements of the phone based on the template currently open, either from selecting New or Opening an existing data file. Press *Write* to write the data in the current table back to the phone. Press *Insert Row* to add a new row to the grid. The new row will be added as the last row (bottom) of the grid. Press *Delete Row* to delete the current row which is highlighted from the grid.

**Table:** Press *New* to open a new table, based on the product selected. Press *Open* to open a table that was previously saved. Note that a valid table must be open in order to perform an action, such as Read or Write. Press *Save* to save the current table and data to a file. The default file extension that will be used is .NVM. The user will be prompted for a storage location and file name.

**Compare To File:** This feature allows the user to compare data between two separate files. The data in the SEEM Data column will be data from either using the Read action or opening existing data from the Open button. Press Compare and you will be prompted for a file name. To compare data, the data must have been previously saved. Once a file is chosen, the data from that file will be populated into the Compare Data column of the table and will be compared with the data in the SEEM Data column. Any differences in a data string will be highlighted in red. Press the Save Comparison button to save both sets of data being compared to a file. The user will be prompted for a storage location and file name.

**Options:** Select Stop On Fail if you wish the Read/Write process to stop on a command failure. Select Continue on Fail to continue trying to Read/Write on a command failure.

**Read Options:** Select Use Length from Table if you want to read using the data length that is specified in the table. This is what must be used for CDMA1X products all the time. Select Use length of 0x0000 if you want to read the entire SEEM at that specific ID. This option will NOT work with CDMA1X products.

**Editing Data:** To edit SEEM data, double-click on the cell containing data you wish to modify. A message box will appear with the current data. Edit the data as desired and press *OK*. At this time, only the SEEM Data column can be modified.

**Command Type:** Select whether P2K or QC Diag commands will be used to read/write from the phone.

**Graph:** When a user selects a graphable NV item on a CDMA1X product, the user can press this button to display a graphical representation of the data.

### 3.4 Run Test Command Script

**Run Custom Test Command Scripts:** See the description in the Header area of any MA on how to properly save a test command script. Once a script has been saved, you can either link it to a custom button or run it from this form.

To use:

- 1) First select whether the script is Motorola P2K Commands or Qualcomm Commands. This is crucial in order to know how to handle the commands inside the script. Choosing the wrong one will result in the commands not being sent to the radio properly.
- 2) Press *Browse* to find a previously saved script.
- 3) Select whether you would like the sequence stopped if any of the commands in the script fail.
- 4) Select whether you would like a log file of the script.
- 5) Select either No Log File, Basic Log File (reports failures only), or Complete Log File (reports all commands). The log file will be automatically saved in the directory that you installed RadioComm as ScriptLogFile.txt.
- 6) You can also choose the number of times you would like the script, as a whole, to be executed. This is very convenient for loop-testing commands for performance.
- 7) You may also enter the amount of time delay in between each individual test command. Enter the time in milliseconds. The default is set to 0 milliseconds, or basically as fast as the phone will accept the next command.
- 8) Press *Run Script* to run the script with the options chosen.

### 3.5 Status Bar Information

The status bar is the small bar at the bottom of the screen. This section will define the information that is displayed in this bar.

Mode: This section will display the communication mode that RadioComm is set to use.

Port: This section will display the RS232 communication port that RadioComm is set to use. This section is only used when RS232 communication mode is selected.

BR: This section will display the RS232 baud rate that RadioComm is set to use. This section is only used when RS232 communication mode is selected.

USB: This section will display if a device is found on the USB line to communicate with or not.

CR: This section will display the number of command retries that RadioComm is set to use.

CT: This section will display the command timeout that RadioComm is set to use in seconds.

MCP: This section just states that the RadioComm tool is MOTOROLA INTERNAL USE ONLY.

Copyright....: This section displays the RadioComm copyright information.

CF: This section will display the command format that RadioComm is set to use.

IP: This section will display the IP address that RadioComm is set to communicate with. This is only used when RadioComm is set to TCPIP / System Simulator communication mode.

Port: This section will display the port address that RadioComm is set to communicate with. This is only used when RadioComm is set to TCPIP / System Simulator communication mode.



### **3.6 USB Find Device buttons**

The USB Find Device buttons provides a way for the user to find out if RadioComm detects a radio to communicate with or not. Besides the Radio Detection status information, a user can press the USB Find Device button and the status will be displayed in the appropriate Status Bar location as described in the previous section.

### 3.7 Single / Keep History selections for test command status

All MA selections have a test command status window that will show the complete status of all test commands.

The Single selection is the default and this means that for each command that is sent, the status window will be erased and only the last command details will be shown.

The Keep History selection allows the user to select to save the status of all test commands. This slows the execution of test commands down due to the amount of data in the status window but is handy when debugging issues so that the status of every test command that is sent can be reviewed.

### 3.8 Radio Detection Status

In the upper right corner of RadioComm there is a Radio Detection status area. This area consists of a simple colored circle to show the connection status of a radio. This status will be displayed only when either of the USB or TCP/IP over USB (BLAN) communication modes is selected.

Red Circle: This status means that no radio is detected.

Blue Circle: This status means that a radio is detected and in Motorola USB Modem mode. (AT commands or QC test commands)

Green Circle: This status means that a radio is detected and in USB Composite Device mode. (Motorola P2K Test Commands)

Yellow Circle: This status means that a radio is enumerated as a USB LAN device but the socket connection is not yet successful. (Motorola P2K or QC test commands in USB LAN mode)

Pink Circle: This status means that a radio is enumerated as a USB LAN device and the socket connection was successful. (Motorola P2K or QC test commands in USB LAN mode)

White Circle: This status means that a USB to RS232 converter is detected and can be setup for use for project D phones.