# MODEL RX10

# Telephone CPE Tester


# User's Manual

**Revision 4.0**

**April 2004**

**Important Safety Instructions**

The following safety instructions apply to the Model RX10 Telephone CPE Tester

1. Read and follow all warning notices and instructions marked on the product or packaging, or included in the manual.
2. The Model RX10 should not be operated in environments where the ambient temperature exceeds 122° F (50° C).
3. Do not attempt to service this product yourself. Refer all servicing to Rochelle Communications or an Authorized Rochelle Distributor, Dealer, or Agent.
4. Use only the included power adapter. Use of other power adapters voids the warranty and can damage the RX10.

**Product Warranty**

Rochelle Communications, Inc. warrants that the Model RX10 Telephone CPE Tester will be free from defects in material and workmanship under normal installation for a period of one year from the date of original purchase.

The obligation of Rochelle under this warranty shall be limited to repair or replacement (at our option) during the warranty period. Any part which proves to be defective in material workmanship under normal installation, use, or service, is covered under the warranty, provided the product is returned to Rochelle or an Authorized Rochelle Distributor, Dealer, or Agent.

*NOTE:* TRANSPORTATION OR SHIPPING CHARGES ARE NOT THE RESPONSIBILITY OF ROCHELLE.

The above warranty shall not apply to defects resulting from misuse, abuse, neglect, accident, destruction, alteration of the serial number, operation outside of the environmental specifications for the product, improper electrical voltages or currents, unauthorized modifications, or repair, alteration, or maintenance by any person other than Rochelle or a Rochelle Authorized Distributor, Dealer, or Agent.

This warranty is in lieu of all other expressed warranties, obligations, or liabilities. Rochelle makes no expressed or implied warranties regarding the quality, merchantability, or fitness for a particular purpose beyond those that appear in the applicable manual.

In no event will Rochelle be liable for any special, incidental, consequential or punitive damages for breach of this warranty, expressed or implied, including, but not limited to, loss of profits or damages to business or business relations.

**Warranty Service**

To obtain warranty service, products must be returned to Rochelle or to an Authorized Rochelle Distributor, Dealer, or Agent. All product returns require a Return Material Authorization (RMA).

Customer shall prepay shipping charges for products returned to Rochelle for warranty service. Rochelle shall pay shipping charges associated with the return of the serviced products to the customer. However, Rochelle cannot assume liability for duties and taxes for products returned to customers located outside the USA.

**Address for Service**

Rochelle Communications, Inc.
Attn: Product Service
8906 Wall Street, Suite 205
Austin, Texas 78754

USA

**Non-Warranty Service**

Rochelle will either repair or replace (at its option) any defective product not covered under warranty.

Repair charges are available from the Rochelle Product Service Department upon request. Out-of-Warranty repair charges are based upon service rates in effect at the time of return.

The warranty on a serviced product is ninety days measured from the date of service.

**Rochelle Customer Service**

When contacting Rochelle Customer Service Department, make sure to have the following information available:

- Product name and model
- Serial Number
- Description of the problem

**Customer Service Contact Information**

| | |
|---|---|
| **Telephone** | +1 512.339.8188 (8:30AM to 5:30PM CST Monday through Friday) |
| **Fax** | +1 512.339.1299 |
| **E-mail** | techsupport@rochelle.com |

**Technical Specifications**

| | |
|---|---|
| **Telephone Line Simulation** | 2-Wire, Loop Start |
| AC Impedance | 600 ohms |
| DC Voltage | -28VDC unit-controlled polarity |
| Line Current Feed: | 24 mA typical |
| Ringer: | 50 Vac (rms) @ 25 Hz |
| **Audio Playback and Record** | 4-Bit ADPCM coding |
| **Country Emulation** | USA, China, France, Italy, Sweden, and UK. |
| Country Parameters: | Ringing Cadence, Dial Tone, Ringback Tone, Caller ID |
| **Caller ID Simulation** | Type I and Type II |
| Signaling: | Bell 202 or ITU V.232 FSK |
| Data Rate: | FSK: 1200 bps; DTMF: 10 digits/sec. typical |
| Levels: | -24 dBm to -13.5 dBm in 1.5 dB increments (+/- 2 dB accuracy) |
| **DTMF Receiver** | |
| Frequency Deviation Accept: | +/-1.5%, +2 Hz nominal |
| Frequency Deviation Reject: | +/- 3.5% |
| Amplitude for Detection: | -32 dBm to 0 dBm per tone |
| Minimum Duration: | 40 ms or greater |
| **Power** | |
| Battery: | 9VDC Alkaline Battery |
| External AC Adapter | 100 to 220 Vac 50/60 Hz Input, 9VDC @ 500mA Output, center pin positive |
| **General** | |
| Dimensions: | 4.75" by 3.0" by 1.3" (12 by 7.5 by 3.5 cm) |
| Weight: | 0.5 pounds (225 grams) |
| Operating Temperature: | 32°'F to 122°'F (0°C to 50°C) |
| Operating Humidity: | 10 to 90 % non-condensing |

**FCC Part 15** This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will have to correct the interference at his or her own expense.

## GETTING STARTED

Install the 9-V battery in the battery compartment and switch on the RX10 .The RX10 will execute a self-test sequence and display the following screens in sequence:

| | | | |
|---|---|---|---|
| RX10-A<br>TESTER | VERSION<br>1.0 USA | SELFTEST<br>OK | READY<br>ON-HOOK |

***Note:*** The RX10 will display an error message if the self-test fails.

## OVERVIEW

The RX10 is a handheld Central Office (CO) simulator that provides DC voltage and loop current, call progress signals, Caller ID generation, DTMF detection, and other functions.

Selection of a country in the Programming Mode sets all call progress signals appropriately. The RX10 has three operational modes; these modes are described in detail in this manual.

**Call Progress Mode:** This mode allows the RX10 to function as a CO simulator with dial tone, ringing, ringback, Caller ID, and other call progress signals specified for the country selected in the Programming Mode.

**Keypad Mode:** This mode allows access to the primary function in the RX10:

1. Ringing simulation
2. Caller ID (Type I and Type II) generation
3. Message Waiting simulation (Stutter Dial Tone or FSK)
4. Fixed-Line SMS
5. Reverse Polarity
6. Extension phone simulation
7. FAX CNG tone generation and CED tone detection
8. 20-second message recording
9. 20-second message playback

**Programming Mode**: This mode allows RX10 configuration through an external telephone.

## Call Progress Mode

Connect a Device Under Test (DUT) to the RJ-11 jack on the RX10. When the DUT goes off hook, the RX10 will provide dial tone and loop current. The LCD on the RX10 will display:

| |
|---|
| READY<br>OFF-HOOK |

***Note:*** The red LED on the left of the keypad indicates the DUT is off-hook.

(Continued on next page)
Enter DTMF digits (manually or automatically) with the Device Under Test (DUT). The RX10 will stop sending dial tone as soon as the first digit is detected. ***Note:*** Do not use the * and # characters in the Call Progress Mode; these are reserved for programming. The LCD on the RX10 will display the entered digits. For instance, entering 3398288 on the DUT will display:

```
3398188
(DTMF)
```

The RX10 provides ringing signals starting five seconds after the last digit is entered. Ringing will continue until the call is completed or a function key is pressed. Should hook-flash occur during the call, the RX10 will detect it, and the LCD will display "FLASH" for one second:

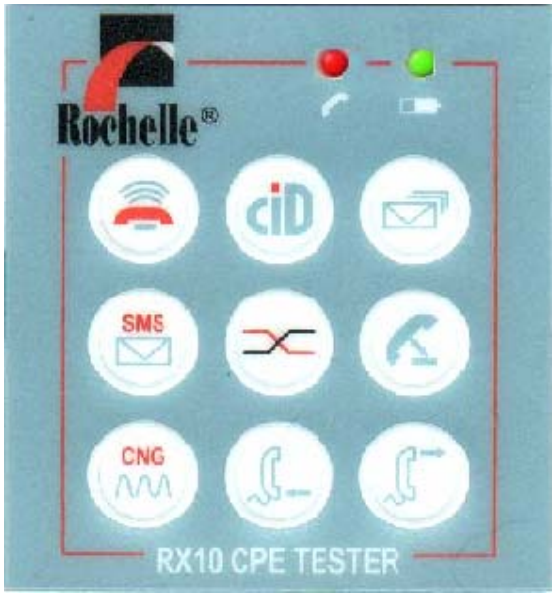
```
3398188
(FLASH)
```

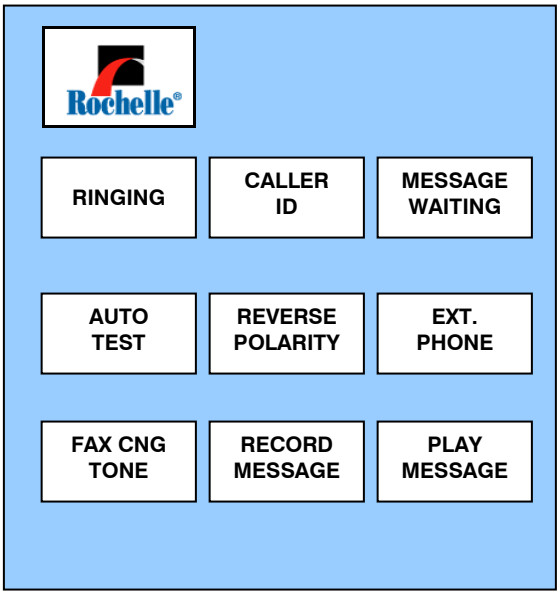
The LCD of the RX10 will revert to the READY mode when the call is completed.

***Note:*** All signals are transmitted with the frequencies and cadences specified for the selected country. Default signal levels are -18 dBm, but can be changed in the Programming Mode.

**Keypad Mode**

The keypad of the RX10 has nine keys that correspond to the functions in the unit. The red LED on the left indicates the DUT is off-hook. The LED on the right indicates battery status. The green LED on the right indicates it's time to recharge the battery.



**RINGING:** Press the **Ringing** key to send a ringing signal as defined for the selected country. Press the key a second time to stop ringing. The RX10-A will only send ringing if the DUT is on-hook.

The LCD of the RX10 will display

```
RINGING
ON-HOOK
```

**CALLER ID:** Press the **Caller ID** key to send a Caller ID signal as defined for the selected country. The RX10-A will send **Type I Caller ID** if the DUT is on-hook. The RX10-A will send **Type II Caller ID** if the DUT is off-hook.

**Type I Caller ID**: The caller ID message comprises the Date & Time, Name, and Number. The Date & Time will always be 12:30 02-28. The Name will always be John Smith. The Number will default to 0987654321, though can be changed in the programming mode (see below).

After the **Caller ID** key is pressed, the LCD of the RX10 will display:

```
CALL ID
ON-HOOK
```

then

```
CI = 0987
65432
```

then

```
RINGING
ON HOOK
```

The Caller ID function terminates when the DUT goes off-hook or the **Ringing** key is pressed.

---

**Type II Caller ID (Caller ID on Call Waiting):** The RX10 will send Type II Caller ID if the DUT is off-hook. The Caller ID message will be the same as described above for Type I Caller-ID.

After the **Caller ID** key is pressed, the LCD of the RX10 will display:

```
CALL ID
OFF-HOOK
```

If the RX10 receives acknowledgement from the DUT, then the LCD of the RX10 will display:

```
CI = 0987
65432
```

If the RX10 does **not** receive acknowledgement from the DUT, then the LCD will display:

```
**FAIL**
NO ACK
```

The Caller ID function terminates when the DUT goes on-hook

**MESSAGE WAITING:** Press the **Message Waiting** key to send either a **Stutter Dial Tone** or **FSK** signal as defined for the selected country. The DUT must be off-hook for this function.

**Stutter Dial Tone:** If the selected country specifies Stutter Dial Tone, the RX10 will transmit eight short burst of dial tone, followed by continuous dial tone. The LCD will display:

```
STUTTER
OFF-HOOK
```

If the DUT is on-hook, then the LCD will display:

```
GO
OFF-HOOK
```

Dial tone is transmitted until the DUT goes on-hook.

---

**FSK:** If the selected country specifies FSK signaling, the RX10 will transmit an FSK signal using the Caller ID format for the selected country. The LCD of the RX10 will display:

```
MSG
WAITING
```

After the message is sent, the LCD will display:

```
MESSAGE
SENT
```


**Fixed-Line SMS:** Press the **SMS** key to send an SMS signal as defined for the selected country. The RX10 currently supports **Protocol I SMS** for the UK, and **Protocol II** for Italy and China. The DUT must be on-hook before pressing the **SMS** key.

**SC Number:**

The correct Service Center (SC) number must first be programmed into the RX10. See the **Programming Mode** section of the manual for instructions on programming the SC number.

(Continued on next page)

**Protocol I (UK):** After pressing the **SMS** key, the LCD of the RX10 will display the SC number. For example, if 01612749990 is programmed as the SC number, then the LCD of the RX1 will display:

```
SC = 0161
2745990
```

If the DUT does not recognize the SC number, then the LCD of the RX10 will display:

```
WAITING
```

until the **SMS** function times out.

The DUT will go off-hook if it recognizes the SC number, and the LCD of the RX10 will display

```
SMS P-1
ON-LINE
```

The DUT will then send an acknowledgement (ACK) signal. When the RX10 receives the ACK signal, the LCD of the RX10 will display:

```
SMS P-1
1ST ACK
```

When the RX10 receives the ACK signal, the RX10 will transmit an SMS message, and the LCD of the RX10 will display:

```
MESSAGE
SENT
```

The SMS function terminates when the DUT goes on-hook.

---

**Protocol II (Italy and China):** After pressing the **SMS** key, the LCD of the RX10 will display the SC number. For example, if 042111 is programmed as the SC number, then the LCD of the RX1 will display:

```
SC =
042111
```

If the DUT does not recognize the SC number, then the LCD of the RX10 will display:

```
WAITING
```

until the **SMS** function times out.

The DUT will go off-hook if it recognizes the SC number, and the LCD of the RX10 will display

```
SMS P-2
ON-LINE
```

(Continued on next page)

When the RX10 receives the ACK signal, the RX10 will transmit an SMS message, and the LCD of the RX10 will display:

```
MESSAGE
SENT
```

The SMS function terminates when the DUT goes on-hook.

**REVERSE POLARITY:** Press the **Reverse Polarity** key to reverse the polarity of the DC voltage and loop current. Press the key a second time to return to normal polarity.

The LCD will display

```
READY
REV POL
```

after the 1st press, then

```
READY
NRM POL
```

after the 2nd.

**EXTENSION PHONE:** Press the **Extension Phone** key to simulate an extension phone (with 600 Ohms impedance) in parallel with the RJ-11 jack. Press the key a second time to return to normal polarity.

The LCD will display

```
READY
EXT. ON
```

after the 1st press, then

```
READY
EXT. OFF
```

after the 2nd.


**FAX CNG TONE:** Press the **FAX CNG Tone** key to send a FAX CNG tone comprising five sequential 1100 Hz tone bursts of 500 ms separated by three seconds of silence.

During the CNG tone transmission, the LCD of the RX10 will display

```
CNG TONE
```

If the RX10 detects a CED tone (2100 Hertz) from a FAX machine connected to the RJ-11 jack, then the LCD of the RX10 will display

```
CNG TONE
CED OK
```

The RX10 will return to the READY mode after the last tone burst.

**AUDIO RECORD:** Press the **Audio Record** key to record up to 20 seconds of audio from a telephone connected to the RJ-11 jack. Press the key, and go off-hook; the RX10-A will play a short beep, then speak normally into the handset.

The LCD of the RX10 will display

```
--------
RECORD
```

during the recording.

Recording will end after 20 seconds, or press the **Audio Record** key a second time to end the recording sooner. The RX-10D will then return to the READY mode.

**AUDIO PLAYBACK:** Press the **Audio Playback** key to play up to 20 seconds of a telephone connected to the RJ-11 jack. Press the key, then go off-hook. The RX10-A will play the recorded message from the telephone handset.

The LCD of the RX10 will display

```
--------
PLAYBACK
```

during the playback.

Playback will end after 20 seconds, or press the **Audio Playback** key a second time to end the playback sooner. The RX-10D will then return to the READY mode.

**Programming Mode**

To change RX10 parameters, connect a telephone to the RJ-11 jack on the RX10, go off-hook, and press the star key twice (**). The LCD will display:

```
PROGRAM
```

Once in the **Programming Mode**, the following parameters may be adjusted:

- ✓ Country Selection
- ✓ Caller ID Number
- ✓ Dial Tone Signal Level
- ✓ Ringback Signal Level
- ✓ CAS Alert Tone Signal Level
- ✓ FSK Signal Level
- ✓ FAX CNG Signal Level
- ✓ DTMF Signal Level

Press the pound key (#) after each parameter is changed, then go on-hook. You must then press the star key twice (**) to re-enter the **Programming Mode** to change other parameters.

**Programming Mode: Country Selection**

Press ** to enter the **Programming Mode,** then enter the country code followed by a **#**. The six valid Country Codes for the RX10 are:

| | |
|---|---|
| USA | 001 **#** |
| UK | 0044 **#** |
| FRANCE | 0033 **#** |
| ITALY | 0039 **#** |
| SWEDEN | 0046 **#** |
| CHINA | 0086 **#** |

After pressing **#**, the LCD of the RX10 will display a message with the country code. For example, entering 001 **#** will display:

```
COUNTRY
001 USA
```

If you enter a country code not supported by the RX10, the LCD of the RX10 will display:

```
INVALID
ENTRY
```

If you would like to change more parameters, go on-hook and off-hook with the telephone, then press ** to enter the Programming Mode. Otherwise, the RX10 will return to the READY mode.

**Programming Mode: Caller ID Number**

Press ** to enter the **Programming Mode,** then enter "11" followed by the desired Caller ID number followed by a **#**. Numbers may have up to 16 digits.

After pressing **#**, the LCD of the RX10 will display a message with the new Caller ID number. For example, entering 115123398188 **#** will display:

```
CI = 512
3398188
```

If you enter an invalid number, the LCD of the RX10 will display:

```
INVALID
ENTRY
```

If you would like to change more parameters, go on-hook and off-hook with the telephone, then press ** to enter the Programming Mode. Otherwise, the RX10 will return to the READY mode.

**Programming Mode: SC Number**

Press ** to enter the **Programming Mode,** then enter "22" followed by the desired Caller ID number followed by a **#**. Numbers may have up to 16 digits.

After pressing **#**, the LCD of the RX10 will display a message with the new Caller ID number. For example, entering 22621479990 **#** will display:

```
SC = 621
479990
```

If you enter an invalid number, the LCD of the RX10 will display:

```
INVALID
ENTRY
```

If you would like to change more parameters, go on-hook and off-hook with the telephone, then press ** to enter the Programming Mode. Otherwise, the RX10 will return to the READY mode.

**Programming Mode: Signal Levels**

You may adjust the Signal Level of any of the RX10 signaling parameters: Dial Tone, Ringback, CAS Alert Tone, FSK, FAX CNG, and DTMF

Press ** to enter the **Programming Mode**, then enter appropriate code followed by a **#**.

| Level | Dial Tone | Ringback | CAS Alert | FSK | FAX CNG | DTMF |
|---|---|---|---|---|---|---|
| -24.0 dBm | 331 # | 441 # | 551 # | 661 # | 771 # | 881 # |
| -22.5 dBm | 332 # | 442 # | 552 # | 662 # | 772 # | 882 # |
| -21.0 dBm | 333 # | 443 # | 553 # | 663 # | 773 # | 883 # |
| -19.5 dBm | 334 # | 444 # | 554 # | 664 # | 774 # | 884 # |
| -18.0 dBm | 335 # | 445 # | 555 # | 665 # | 775 # | 885 # |
| -16.5 dBm | 336 # | 446 # | 556 # | 666 # | 776 # | 886 # |
| -15.0 dBm | 337 # | 447 # | 557 # | 667 # | 777 # | 887 # |
| -13.5 dBm | 338 # | 448 # | 558 # | 668 # | 778 # | 888 # |

After pressing **#**, the LCD of the RX10 will display a message with the appropriate Signal Level. For example, entering the code for -18.0 dBm will display one of the following messages:

| | | | | | |
|---|---|---|---|---|---|
| DIALTONE<br>-18 DBM | RINGBACK<br>-18 DBM | ALRTTONE<br>-18 DBM | FSK<br>-18 DBM | FAX CNG<br>-18 DBM | DTMF<br>-18 DBM |

If you enter an invalid number, the LCD of the RX10 will display:

```
INVALID
ENTRY
```

If you would like to change more parameters, go on-hook and off-hook with the telephone, then press ** to enter the Programming Mode. Otherwise, the RX10 will return to the READY mode.