

# **NRC7292 Evaluation Kit**

## **User Guide**

### **(AT-CMD Test Tool)**

**Ultra-low power & Long-range Wi-Fi**

**Ver 1.1.4**  
**Mar 31, 2020**

**NEWRACOM, Inc.**

## **NRC7292 Evaluation Kit User Guide (AT-CMD Test Tool)**

### **Ultra-low power & Long-range Wi-Fi**

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# 1 Introduction

**NRC7292 AT-CMD Test Tool** is a GUI program that allows users to easily test out NRC7292 AT-commands in graphical manner. All testable command sets supported by the program are all based on the **NRC7292 Evaluation Kit User Guide (AT-command)** document. Although the usage of the program should be mostly self-explanatory, this manual will nevertheless serve as a supplementary document that clarifies the usage of more advanced features of the program.

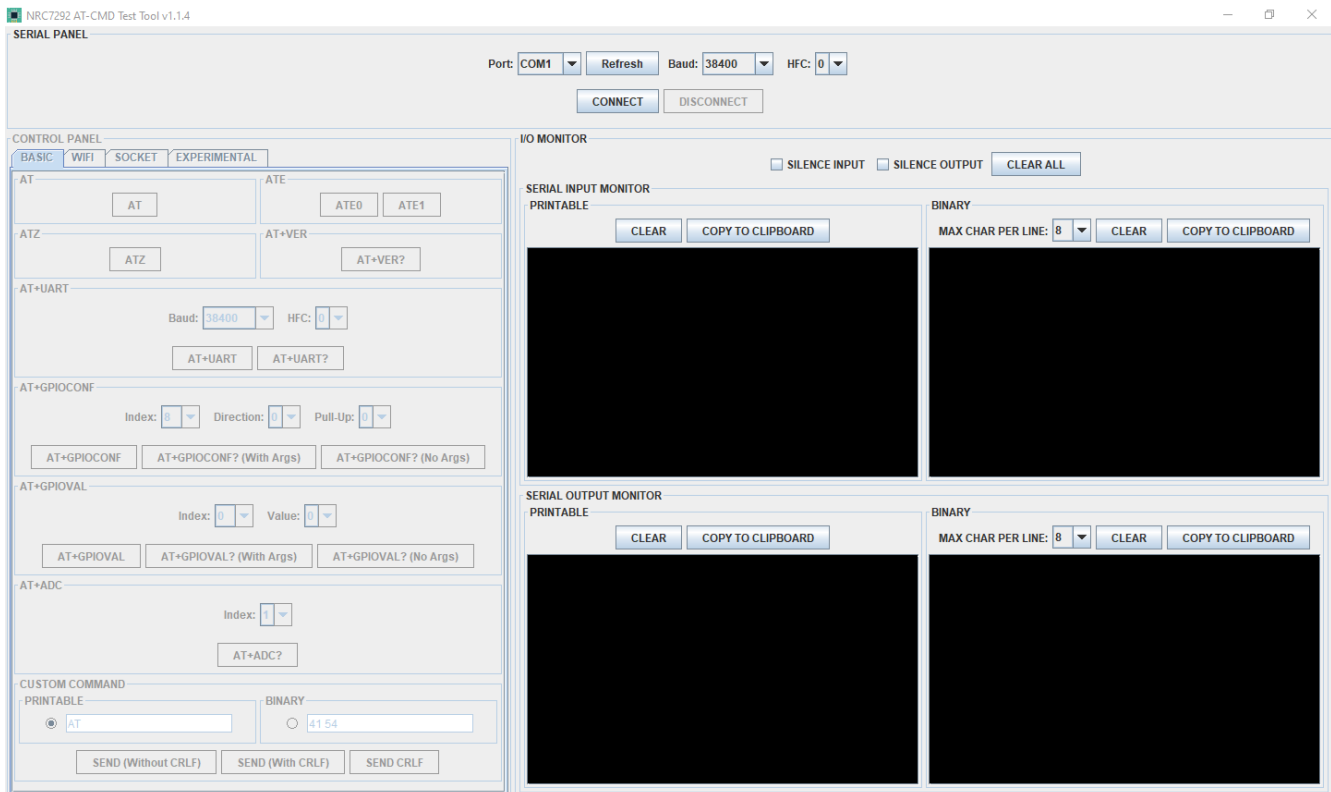


Figure 1.1 AT-CMD Test Tool

## 2 Usage

The program window is divided into the **Serial Panel**, **I/O Monitor** and **Control Panel**.

### 2.1 Serial Panel

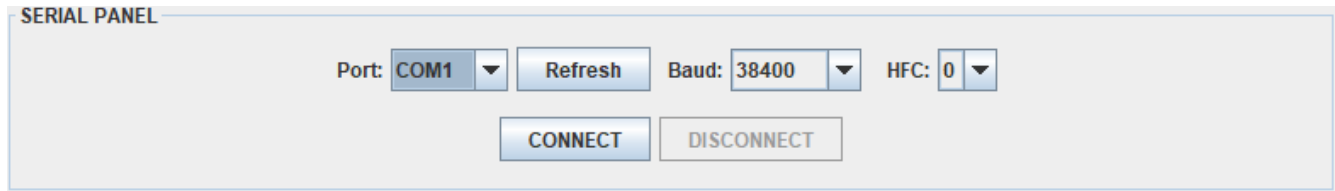


Figure 2.1 Serial Panel

The **Serial Panel** can be used to configure UART-serial parameters (serial port, baud rate, data bits, parity bits, stop bits and H/W flow control option) and connect the PC to, or disconnect it from, the NRC7292 module. The default parameter values in the program correspond to the default UART parameters used by the AT-firmware. Successful connection will enable the **Control Panel**.

### 2.2 I/O Monitor

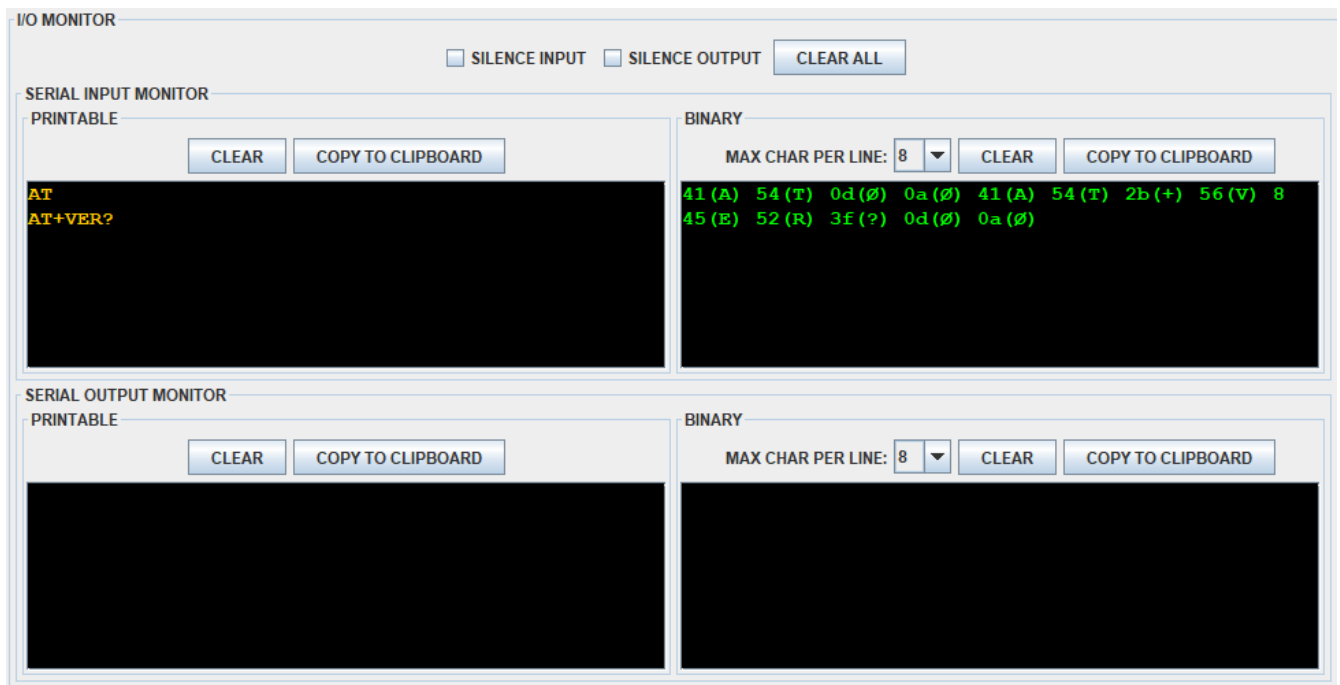


Figure 2.2 I/O Monitor

The **I/O MONITOR** can be used to monitor the input/output serial byte-streams between the PC and the NRC7292 module. Each of the two byte-streams is separately examined as both printable characters (0x9 (TAB), 0x10 (LF), 0x20~0x7E) and raw bytes (0x00~0xFF) simultaneously.

## 2.3 Control Panel

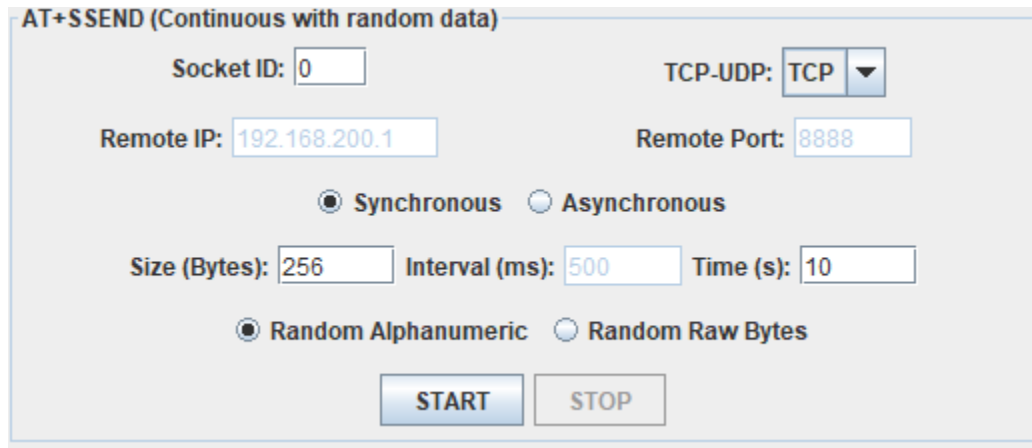
The screenshot shows the 'CONTROL PANEL' application window. It features four tabs: 'BASIC', 'WIFI', 'SOCKET', and 'EXPERIMENTAL'. The 'BASIC' tab is selected. The interface is organized into several functional groups, each with a title and associated controls:

- AT**: A single button labeled 'AT'.
- ATE**: Two buttons labeled 'ATE0' and 'ATE1'.
- ATZ**: A single button labeled 'ATZ'.
- AT+VER**: A single button labeled 'AT+VER?'.
- AT+UART**: A 'Baud' dropdown menu set to '38400' and an 'HFC' dropdown menu set to '0'. Below these are two buttons: 'AT+UART' and 'AT+UART?'.
- AT+GPIOCONF**: Three dropdown menus for 'Index' (set to '8'), 'Direction' (set to '0'), and 'Pull-Up' (set to '0'). Below these are three buttons: 'AT+GPIOCONF', 'AT+GPIOCONF? (With Args)', and 'AT+GPIOCONF? (No Args)'.
- AT+GPIOVAL**: Two dropdown menus for 'Index' (set to '0') and 'Value' (set to '0'). Below these are three buttons: 'AT+GPIOVAL', 'AT+GPIOVAL? (With Args)', and 'AT+GPIOVAL? (No Args)'.
- AT+ADC**: A dropdown menu for 'Index' (set to '1') and a button labeled 'AT+ADC?'.
- CUSTOM COMMAND**: Two radio buttons, 'PRINTABLE' (selected) and 'BINARY'. The 'PRINTABLE' section has an input field containing 'AT'. The 'BINARY' section has an input field containing '41 54'. Below these are three buttons: 'SEND (Without CRLF)', 'SEND (With CRLF)', and 'SEND CRLF'.

Figure 2.3 Control Panel

Following the categorization of commands in the **NRC7292 Evaluation Kit User Guide (AT-command)**, the **Control Panel** is divided into four tabs: **BASIC**, **WIFI**, **SOCKET** and **EXPERIMENTAL**. The usage should be mostly self-explanatory; users simply click the desired command button after configuring the desired parameters. The description of the parameters is delineated in full detail in the NRC7292 Evaluation Kit User Guide (AT-command) document.

## 2.4 Synchronous / Asynchronous Transmission



The control panel for AT+SEND (Continuous with random data) includes the following fields and controls:

- Socket ID: 0
- TCP-UDP: TCP (dropdown menu)
- Remote IP: 192.168.200.1
- Remote Port: 8888
- ☒ Synchronous ☐ Asynchronous
- Size (Bytes): 256
- Interval (ms): 500
- Time (s): 10
- ☒ Random Alphanumeric ☐ Random Raw Bytes
- START button
- STOP button

Figure 2.4 Control Panel

Continuous transmission test modes including random data transfer, file transfer and echo integrity test support synchronous and asynchronous transmission types. Under synchronous mode, the next packet is sent only after receiving the “OK” response from the previous response except for the first packet, with no delay in between the acknowledgement of the “OK” response and the transmission of the next packet. Under asynchronous mode, packets are simply transmitted periodically with the user-configured inter-packet **Interval** in millisecond.



## 2.5 Echo Integrity Test

The screenshot shows a software window titled "Echo Integrity Test". At the top, there are two radio buttons: "Synchronous" (selected) and "Asynchronous". Below these are three input fields: "Socket ID:" with the value "0", "Block Size (Bytes):" with the value "256", and "Interval (ms):" with the value "100". Underneath these fields are two more radio buttons: "Random Alphanumeric" (selected) and "Random Raw Bytes". A checkbox labeled "Enable File Dump" is located below the radio buttons. The panel is divided into two sections for file paths. The "Incoming Payload Dump Path" section has a text box containing ".INCOMING\_PAYLOAD.txt" and a "Set" button. The "Outgoing Payload Dump Path" section has a text box containing ".OUTGOING\_PAYLOAD.txt" and a "Set" button. At the bottom of the panel, there are two large text boxes for "Received Byte Count" and "Sent Byte Count", both displaying the value "0". At the very bottom, there are three buttons: "START", "PAUSE/UNPAUSE", and "STOP".

**Figure 2.5 Echo Integrity Test Panel**

The echo integrity test is used to perform a TRX integrity test by transmitting a random byte sequence which, upon reaching the destination, is echoed back to the source and compared against the original byte sequence for any possible mismatch between the transmitted sequence and the received sequence. The test will terminate with an error message if a mismatch is detected.

Before starting the echo integrity test on the test tool, the user must first run the echo-server script in the 'experimental' subdirectory included in the program package. This will start an echo-server that runs on TCP/IP port 12345 but the port may be easily modified by editing the script, if necessary.

### 3 Revision History

Revision No	Date	Comments
Ver 1.0.1	9/27/2019	First version for external document release
Ver 1.1.3	1/31/2020	Updated texts and figures.
Ver 1.1.4	3/31/2020	Updated figures.