

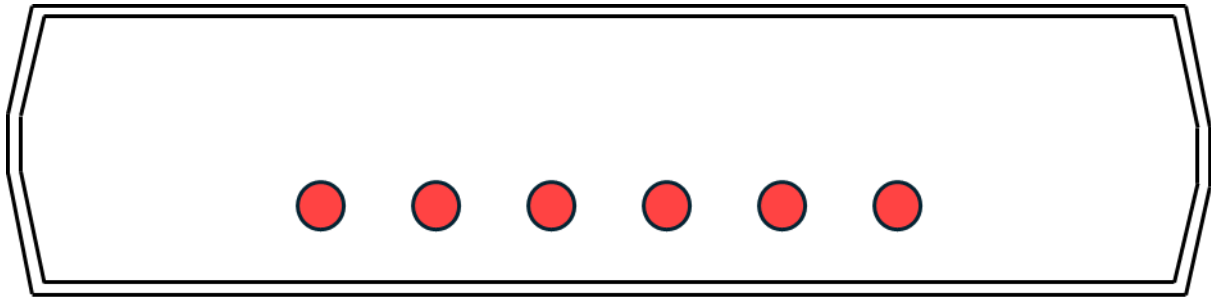
8080 Computer System

**WIFI Modem User Manual**

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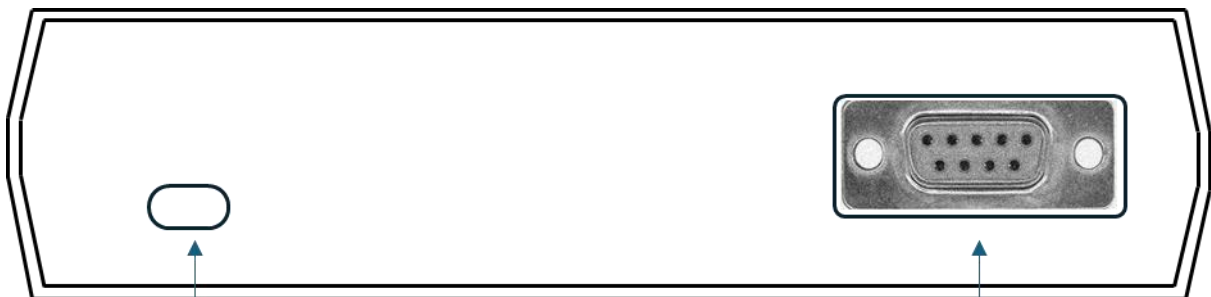
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## WiFi Modem Front/Back Panel



WIFI AA RI DCD TX RX

- WIFI Illuminates when connected to a wireless network.
- AA Illuminates when listener process is running.
- RI Illuminates when incoming connection request to listener process is received.
- DCD Illuminates when outbound connection (telnet, etc.) is established.
- TX Illuminates when characters are transmitted to the network.
- RX Illuminates when characters are received from the network.



USB-C  
POWER

RS-232

## Specifications

Size	1.65" x 4.75" x 6"
DC Power Input	5V @ 1A (max)
DC Power Connector	USB-C
Operating Temperature	-40C to +85C
WiFi Band	2G (2412 – 2484 MHz)
Serial Connector	DB-9
Serial Type	RS-232C
Serial Baud Rates	300 – 115200 Baud
Serial Data Format	Async, 7/8 data bits, 1/2 stop bits, odd/even/none parity
Modem Command Set	Hayes AT Compatible
Modes	Auto-Answer, Auto-Dial

## Zimodem 4.0 Modem Software

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## Introduction

This firmware code provides an API for communication between a serial terminal and the ESP8266 or ESP32. It simulates the old-style Hayes "AT" commands, so that the ESP8266 appears to the terminal as if it were a Hayes modem. These "AT" commands may then be issued to the ESP8266 to force it to connect to a wireless access point, and from there to make one or more manageable connections to the internet. It also includes a streaming serial "telnet" mode, and server/port listener capabilities.

The default baud rate that the firmware establishes is 1200. Be sure to use the commands below to set this to the proper baud rate for your terminal/host computer. If you plan on using the Commodore 8-bit utilities, keep the firmware baud rate saved at 1200.

## Building from source

To build this firmware for the ESP-01 or ESP-12, I used the Arduino IDE rev1.8.10 with the 2.7.4 Arduino ESP8266 libraries using the Generic ESP8266 Module. Versions newer than 2.7.4 may not work.

Install the libraries from the Boards Manager using:

[http://arduino.esp8266.com/stable/package\\_esp8266com\\_index.json](http://arduino.esp8266.com/stable/package_esp8266com_index.json)

Both versions of the firmware are built with SPIFFS enabled. On the ESP8266, I used settings of 1M/160k, but you may want to alter that depending on your hardware and needs. To build this firmware for the ESP-32, I also used the Arduino IDE rev 1.8.10 with the Arduino ESP32 Dev Module installed from the board manager with the following settings:

QIO, 8MB, 80MHZ, 921600, NONE, Avrisp Mk II, and 3MB App space.  
Currently on library version 2.0.17.

\*\* Before you build, you'll want to go through the file zimodem.ino and configure the various #defines to reflect hardware pin assignments and features. These especially include:

```
INCLUDE_IRCC
SUPPORT_LED_PINS
INCLUDE_SD_SHELL
INCLUDE_OTH_UPDATES
DEFAULT_BAUD_RATE
PIN_FACTORY_RESET
DEFAULT_PIN_* assignments for your hardware
INCLUDE_SSH
MAX_PIN_NO
```

In addition, at the top of pet2asc.h is where the default main and debug UARTs are assigned (MAIN\_UART\_NUM). Make sure those reflect your wiring as well.

## General Usage

Upon initialization, or any time the ESP module is reset, the modem will display its version, and some information about the host hardware, and then read a configuration file from the internal SPIFFS to re-establish the previously set baud rate, and to attempt to re-connect to the previously connected wireless router. The first time it is run, the firmware will set a baud rate of 1200 and display INITALIZED to let you know that no previous WiFi configuration was found. Once the serial terminal displays READY, it is ready to receive commands.

### **AT+CONFIG**

The first command you'll probably want to enter is used to connect to a wireless router and set your flow control and other command mode settings.

#### *Linefeeds*

If you plan to use this primarily from a computer that doesn't need linefeeds, such as the C64, you'll want to enter ATR0 to go into carriage-return only mode, and then AT&W to save this setting as well.

#### *Baud Rate*

If you want to operate at a higher baud, you'll want to enter ATB9600 (or whatever baud rate you want to try) and then reconnect your terminal program to the modem at that new baud rate. If everything looks good, and you want to keep the new baud rate across restarts, save the new baud rate with AT&W. Warning though: Most of the example C64 programs assume the modem defaults to 1200 baud.

### **AT+PRINT**

If you want to try printing to a CUPS/IPP-printer, enter "AT+PRINT?:<host>:<port>/<path>" followed by your data; where "?" is A)scii, P)etscii, or R)aw. A 5 second pause in incoming data completes the document and returns to command mode.

Example: AT+PRINTR:192.168.1.10:631/ipp/printer

Followed by ENTER and then the data to print, without any pause longer than 5 seconds. Entering AT+PRINT again will repeat printing to the previous URL.

### **AT+IRC**

If you want to chat on IRC, enter AT+IRC, enter a nickname and an irc host as a phone number entry, then /join channels, chat, or /quit.

### **AT+SHELL**

ESP32 Modem users with SD-cards can enter AT+SHELL to get a shell command prompt. Enter a "?" to get a list of shell commands.

### **AT+PING**

To check if your WiFi is connected and DNS resolution is working.

Example: AT+PING"google.com"

An OK means a response was received.

### **AT+COMET64**

For modems with SD-cards, this puts the modem into 2400 bps, CSIP protocol mode for reading/writing directly to the card (for V-1541). Use "+++" to exit.

**AT+HOSTCM**

For modems with SD-cards, this puts the modem into HOSTCM protocol mode for reading/writing directly to the card (for Commodore SupetPET SP9000). Use “+++” to exit.

**AT+1650, AT+1660, AT+1670**

Puts the modem into an emulation mode for Commodore 1650, 1660, and 1670. Changes baud rates accordingly. Use AT&L or AT&F to clear emulation settings.

**AT+SLIP**

Puts the modem into SLIP mode (or ATDT5517545). Baud rates under 57600 will not receive broadcast/multicast packets. Reset modem to exit.

**AT+PPP**

Puts the modem into PPP mode (or ATDT5517546). Baud rates under 57600 will not receive broadcast/multicast packets. Reset modem to exit.

*Telnet Dialing*

If you want to connect to a remote telnet server, eg coffeemud.net, port 23, you'll want to enter AT&S62=1DT"coffeemud.net:23". Don't forget to set your terminal program to the proper translation mode (ANSI, ASCII, or whatever).

*Normal Dialing*

If you are using a Commodore Graphics terminal program and want to connect to a Commodore BBS, or a standard ASCII terminal program for a non-Commodore BBS, you'll want to enter e.g. ATD"cottonwoodbbs.dyndns.org:6502". The "T" in "ATDT" is optional if register 62 is 0 (default).

*Q-Link Setup*

If you want to use Q-Link, you need to add a phone number alias first. To do this, enter ATP"5551212=q-link.net:5190" or enter it from the config menu AT+CONFIG. From the C64 Q-Link client, select "Hayes compatible" 1200 baud modem when prompted.

*BBS/Port Listeners*

If you want to run a Commodore BBS program using the modem, you'll want to configure the BBS program to the same idle baud rate that your modem is using (1200 baud by default), configure it for a Hayes style modem (or the C=1670), and either create a persistent listener using AT+CONFIG, or use an initialization string of "ATROE0S0=1S41=1A6400" plus any other recommended settings from the BBS program. This creates a listener at port 6400 that switches directly to stream mode on the first ring, with no linefeed carriage returns, and no keystroke echo. Your BBS program may require you add certain other settings, such as V0 or X1.. which you should also do.

## AT Command Set

The command set is as follows (not case sensitive):

### **ATZ**

Closes all open socket connections (preserving the Access Point connection), stops all listeners, and resets the state of the Command processor to the saved configuration, preserving the current baud rate and WiFi connection.

### **A/**

Repeats the previous command.

### **ATI**

Show the startup message, including WiFi connection information.

### **ATI0**

Same as ATI.

### **ATI1**

Show the current common variable settings and common 'S' registers.

### **ATI2**

Show the modem's current IP address.

### **ATI3**

Show the modem's current Wireless Router connection.

### **ATI4**

Show only the firmware current version.

### **ATI5**

Show all the current variable settings, all 'S' registers.

### **ATI6**

Show the current mac address.

### **ATI7**

Shows the current formatted time (see AT&T).

### **ATI8**

Show the firmware build date/time.

### **ATI9**

Same as ATI3 but also includes any static settings in the same order as ATW.

**ATI10**

Show the last printer URL used.

**ATA**

If a server listener has generated a RING, then ATA will switch the last rung connection to Stream mode (see ATD).

**ATAn**

Create a server listening on port n. When a connection is received, the terminal will generate 1 or more RINGs according to the ATS0 register, followed by a normal CONNECT response. At this point, all other commands related to connections may be used normally, unless ATS41 is > 0, in which case incoming connections are automatically sent to Stream mode as per ATD or ATA. ATC0 shows listeners and other connections using ATC0.

**ATAPn**

Same as ATAn but causes all incoming connection input to be translated to PETSCII.

**ATATn**

Same as ATAn but causes connection streaming input to be translated to TELNET when changed to Stream mode.

**ATAEn**

Same as ATAn but causes connection terminal ECHO ON when changed to Stream mode.

**ATAXn**

Same as ATAn but causes connection XON/XOFF flow control to be enabled when changed to Stream mode.

**ATN0**

Shut down all listeners leaving client connections open.

**ATNn**

Close server listener with id number n. Does not close any connections received by that listener.

**ATE0**

Turn serial terminal ECHO OFF for command mode.

**ATE1**

Turn serial terminal ECHO ON for command mode.

**ATV0**

Turn off verbose response mode (uses terse numeric response mode).

**ATV1**

Turn on verbose response mode (uses word response mode).

**ATX0**

Turn off extended response codes (1/CONNECT instead of 5/CONNECT 2, etc).

**ATX1**

Turn on extended response codes (5/CONNECT 2 instead of 1/CONNECT, etc).

**ATF0**

Turn on RTS/CTS flow control.

**ATF1**

Turn on XON/XOFF flow control.

**ATF2**

Turn on XON/XOFF flow control and set XON mode. In command mode, immediately go to XOFF when a single connection packet is received. This is very useful when the client wants to ensure it only receives one packet to process. This is an alternative way to use XON/XOFF by having XOFF automatic between packets.

**ATF3**

Similar to ATF2 except that the default is XOFF mode. In command mode, a XON code from the user will immediately trigger either an empty packet response [ 0 0 0 ], or a real packet if one is available. After this, as in ATF2, XOFF is automatically set.

**ATF4**

Turns off flow control for command mode. Affects AT+1670 mode - ATF0 will instead turn on stream mode echo, and ATF1 will turn it off.

**ATQ0**

Turn off quiet mode (sends response codes).

**ATQ1**

Turn on quiet mode (stops sending response codes).

**ATR0**

Suppress linefeed (\n, hex 0A) for end of line. Will only send carriage return (\r, hex 0D).

**ATR1**

Send \r\n (hex 0D0A) for end of line.

**ATR2**

Send \n\r (hex 0A0D) for as end of line.

**ATR3**

Suppress carriage return (\r, hex 0D) for end of line. Will only send linefeed (\n, hex 0A).

**ATBn**

Set new serial Baud Rate. Takes effect immediately.

**ATB"n,xYz"**

Set baud rate n, bits x, parity Y (E, O, M, or N), and stop bits z.

**ATW**

List all wireless network access points scanned within range. The response for each entry is the SSID, followed by the RSSI, followed by an \* character if the connection is encrypted.

**ATWn**

Show up to n wireless network access points scanned within range. The response for each entry is the SSID, following by the RSSI, followed by an \* character if the connection is encrypted.

**ATW"[SSI],[PASSWORD]"**

Connect to a wireless access point with the given SSI and password.

**ATW"[SSI],[PASSWORD],[IP],[DNS],[GATEWAY],[SUBNET]"**

Same as ATW, but with options for static IP, DNS, Gateway, and Subnet (non-DHCP networks).

**ATWP**

Same as ATW but displays result in PETSCII.

**ATD**

Start streaming mode between the current opened connection. Use "+++" to exit back to Command mode.

**ATDn**

Same as ATD but for a connection with ID n. Use "+++" to exit back to Command mode.

**ATD"[HOSTNAME]:[PORT]"**

Open a streaming connection between the terminal and the given host/port. Use "+++" to exit back to command mode.

**ATDP"[HOSTNAME]:[PORT]"**

Same as ATD"[HOSTNAME]:[PORT]" but translates connection input to PETSCII during the streaming session.

**ATDT"[HOSTNAME]:[PORT]"**

Same as ATD"[HOSTNAME]:[PORT]" but translates connection input to TELNET during the streaming session (see S62).

**ATDE"[HOSTNAME]:[PORT]"**

Same as ATD"[HOSTNAME]:[PORT]" but causes terminal echo to be enabled during the streaming session.

**ATDX"[HOSTNAME]:[PORT]"**

Same as ATD"[HOSTNAME]:[PORT]" but causes XON/XOFF flow control to be enabled during the streaming session.

**ATDS"[NAME]:[PASS]@[HOSTNAME]:[PORT]"**

Same as ATD"[HOSTNAME]:[PORT]" but causes SSH connection with username and password during streaming session.

**ATDnnnnnnnn**

Open a streaming connection between the terminal and the given host specified in the modem phone book (see ATP). If the 7-digit phone number "nnnnnnnn" matches a phone book entry, the modem will try to connect to the host defined in the phone book.

**ATC**

Show information for the current network connection in the following format:

[CONNECTION STATE] [CONNECTION ID] [CONNECTED TO HOST]:[CONNECTED TO PORT]

**ATC0**

List information for all network connections in the following format:

[CONNECTION STATE] [CONNECTION ID] [CONNECTED TO HOST]:[CONNECTED TO PORT]

Including any Server (ATA) listeners.

**ATCn**

Change the current connection to the connection identified by ID n. If no connection exists with the given ID, "ERROR" is returned.

**ATC"[HOSTNAME]:[PORT]"**

Create a new connection to the given host and port, assign a new id if the connection is successful, and make this connection the current connection.

**ATCP"[HOSTNAME]:[PORT]"**

Same as ATC"[HOSTNAME]:[PORT]" but causes connection input to be translated to PETSCII when in streaming mode.

**ATCT"[HOSTNAME]:[PORT]"**

Same as ATC"[HOSTNAME]:[PORT]" but causes connection input to be translated as TELNET when in streaming mode.

**ATCE"[HOSTNAME]:[PORT]"**

Same as ATC"[HOSTNAME]:[PORT]" but causes terminal echo to be enabled when in streaming mode.

**ATCX"[HOSTNAME]:[PORT]"**

Same as ATC"[HOSTNAME]:[PORT]" but causes XON/XOFF flow control to be enabled when in streaming mode.

**ATH**

Hang up (disconnect and delete) all open connections. Does not close Server listeners.

**ATH0**

Hang up (disconnect and delete) the current opened connection.

**ATH1**

Put server listeners in “busy” mode if no client connection with ID 1 is open.

**ATHn**

Hang up (disconnect and delete) the open client connection with the given ID n.

**ATO**

Re-enter a streaming session (see ATD) using the previous settings, with the current or previous connection.

**ATP**

List all phonebook entries, using the format:  
Phone number, ATD modifiers, host and port.

**ATP?**

Same as ATP but display notes column.

**ATP"[NUMBER]=[HOSTNAME]:[PORT],[NOTES]"**

Add or Modify an entry to the phone book with the given 7 digit number, host, port, and notes. Use “ATDnnnnnnn” to connect.

**ATPP"[NUMBER]=[HOSTNAME]:[PORT],[NOTES]"**

Same as ATP"[NUMBER]=[HOSTNAME]:[PORT],[NOTES]" but causes connection input to be translated to PETSCII when connected to that entry.

**ATPT"[NUMBER]=[HOSTNAME]:[PORT],[NOTES]"**

Same as ATP"[NUMBER]=[HOSTNAME]:[PORT],[NOTES]" but causes connection input to be translated as TELNET when connected to that entry.

**ATPE"[NUMBER]=[HOSTNAME]:[PORT],[NOTES]"**

Same as ATP"[NUMBER]=[HOSTNAME]:[PORT],[NOTES]" but causes terminal echo to be enabled when connected to that entry.

**ATPX"[NUMBER]=[HOSTNAME]:[PORT],[NOTES]"**

Same as ATP"[NUMBER]=[HOSTNAME]:[PORT],[NOTES]" but causes XON/XOFF flow control to be enabled when connected to that entry.

**ATP"nnnnnnn=DELETE"**

Remove phone book entry for the given phone number “nnnnnnn”.

**ATS0=n**

Change the number of RING messages received by a server listener before a CONNECT response is sent.

**ATS2=n**

Change the escape command mode character (n = 0-255). Defaults to ASCII decimal 43 ("+").

**ATS3=n**

Change the Carriage Return character (n = 0-127). Defaults to ASCII decimal 13 (Carriage Return).

**ATS4=n**

Change the Line Feed character (n = 0-127). Defaults to ASCII decimal 10 (Line Feed).

**ATS5=n**

Change the Backspace character (n = 0-32). Defaults to ASCII decimal 8 (Backspace).

**ATS40=n**

Change the size of the connection packets. Defaults to 127 bytes.

**ATS41=n**

Set all server listener connections to streaming mode when n > 0. If n=0, connections remain in normal command mode (default).

**ATS42=n**

Check the CRC8 value for an attached Transmit command. Example: ATS42=123T"[MESSAGE]" returns error unless 123 is CRC8 of "[MESSAGE]".

**ATS43=n**

Set a standby baud rate n for the next incoming or outgoing connection. ATZ clears.

**ATS44=n**

Set an automatic delay of n milliseconds after most bytes written to the Serial port. This is for computers that support a baud rate, but can't really keep up, and you don't want to use flow control.

**ATS45=n**

Change how packet and AT&G data is delivered. n=0 for normal binary with normal headers; n=1 for 78 char HEX digit streams followed by EOLN with hex digit headers; n=2 for decimal digits followed by EOLN, with decimal digit headers; n=3 for normal without SUM header; n=4 to add packet numbers.

**ATS46=n**

Change DCD line status. n=0 (DCD active HIGH, default), n=1 (DCD active LOW), n=2 (DCD always HIGH), n=3 (DCD always LOW).

**ATS47=n**

Change DCD pin number (n=2 is default).

**ATS48=n**

Change CTS line status. n=0 (CTS active HIGH, default), n=1 (CTS active LOW), n=2 (CTS always HIGH), n=3 (CTS always LOW).

**ATS49=n**

Change CTS pin number (n=0 is default on ESP01, n=5 is default for all others).

**ATS50=n**

Changes RTS line status. n=0 (RTS active HIGH, default), n=1 (RTS active LOW), n=2 (RTS always HIGH), n=3 (RTS always LOW). Not available on ESP01.

**ATS51=n**

Change RTS pin number (n=4 is default). Not available on ESP01.

**ATS52=n**

Changes RI line status. n=0 (RI active HIGH, default), n=1 (RI active LOW), n=2 (RI always HIGH), n=3 (RI always LOW). Not available on ESP01.

**ATS53=n**

Changes RI pin number (n=14 is default). Not available on ESP01.

**ATS54=n**

Change DTR line status. n=0 (DTR active HIGH, default), n=1 (DTR active LOW), n=2 (DTR always HIGH), n=3 (DTR always LOW). Not available on ESP01.

**ATS55=n**

Changes DTR pin number (n=12 is default). Not available on ESP01.

**ATS56=n**

Change DSR line status. n=0 (DSR active HIGH, default), n=1 (DSR active LOW), n=2 (DSR always HIGH), n=3 (DSR always LOW). Not available on ESP01.

**ATS57=n**

Changes DSR pin number (n=13 is default). Not available on ESP01.

**ATS60=n**

Save existing server listeners and restore them later when n > 0. n=0 to clear.

**ATS61=n**

Set print job (AT+PRINT) timeout in seconds (default is 5).

**ATS62=n**

Enable (n > 0) telnet support on the ATD command. Default is 0 (disabled).

**ATS63=n**

Set hangup method while in streaming mode. +++ (n=1), DTR inactive (n=2), or OTH/PDP (n=3).

**ATSn?**

Show current value of status register n.

**+++**

Disconnect current open connection. 1 second pause with no other characters afterwards.

**ATT"[MESSAGE]"**

Transmit the given text string in "MESSAGE", terminated by \r\n, on the current connection.

**ATTn**

Transmit exactly n bytes to the current connection. After sending this command the n bytes to transmit must be sent.

**ATTP"[MESSAGE]"**

Transmit the given text string in "MESSAGE", translating PETSCII to ASCII, with \r\n at the end, on the current connection.

**ATTPn**

Transmit exactly n bytes to the current connection, translating PETSCII to ASCII. After sending this command the n bytes to transmit must be sent.

**ATT+ "[MESSAGE]"**

Transmit the given text string in "MESSAGE", translating PETSCII to ASCII, with \r\n at the end, on the current connection but return the CRC8 of the message instead of OK when successful.

**ATLO**

Re-send the most recently sent data packet.

**ATLn**

Re-send the most recently sent data packet for connection ID n. Prefix n with 0 for earlier packet.

**AT&H**

Show a help file from the web, or brief help otherwise. Use &H6502 to enforce web download.

**AT&L**

Reload the saved configuration.

## **AT&W**

Save the current configuration including:

WiFi (ATW)	Verbose response (ATV)	Hangup mode (S63)
Baud rate (ATB)	Quiet response (ATQ)	Operating mode (AT+16xx)
End of line (ATR)	PETSCII mode (AT&P1)	Listener restore (ATS60)
Flow control (ATF)	Pin status (ATS46 - S58)	Printer spec (AT+PRINT)
Echo mode (ATE)	Rings (ATS0)	Busy message (AT&S"42)
Extended response (ATX)	Listener Stream-mode (ATS41)	Telnet (S62)

## **AT&F**

Restore the modem to factory default settings. Use &F86 to reformat the SPIFFS.

## **AT&On**

Set log configuration. n=1 to turn on internal serial-reception log, n=0 to turn off or view a previously turned-on serial-reception log, n=88 to turn on ESP32 debug port.

## **AT&U**

Check the firmware home page for new version.

## **AT&U6502**

Update firmware from the home page.

## **AT&U=x**

Update firmware from the web to custom version x.

## **AT&Kn**

Flow Control setting similar to ATFn. n=0,1,2: disable, n=3,6: rts/cts, n=4,5: Xon/Xoff

## **AT&Pn**

Translate input and output to/from PETSCII before internal processing. This will not affect received packet data, or the stream mode.

## **AT&Nx**

Show status of ESP module I/O pin x

## **AT&Mn**

Add the byte denoted by n to a list of mask-out bytes. These are bytes that are not transmitted to the serial port in command mode incoming packets. If this command is followed by a C, N, or A command on the SAME LINE, then the setting will apply ONLY to that connection or listener.

## **AT&M**

Reset the mask-out bytes list. No bytes will be masked out. If this command is followed by a C, N, or A command on the SAME LINE, then the setting will apply ONLY to that connection or listener.

## **AT&Dn**

Add the byte denoted by n to a list of delimiter bytes. These are bytes that will compose the last byte in a command-mode incoming packet that is still shorter than the limit set by ATS40. This is useful for CR-LF formatted data. If this command is followed by a C, N, or A command on the SAME LINE, then the setting will apply ONLY to that connection or listener.

## **AT&D**

Reset the delimiter bytes list. No bytes will be delimited, and packets will contain as many bytes as are received and allowed by ATS40. If this command is followed by a C, N, or A command on the SAME LINE, then the setting will apply ONLY to that connection or listener.

## **AT&S"40=[HOSTNAME]"**

Change the modem hostname.

## **AT&S"41=[TERMTYPE]"**

Change the telnet 'termtype' response string.

## **AT&S"42=[BUSYMSG]"**

Change the stream connection 'busy message'.

## **AT&T"[TIMEZONE],[TIME FORMAT],[NTP URL]"**

Set up the NTP clock. DISABLE to disable. Format is like Java SimpleDateFormat, but with % escapes. Each argument is optional.

## **AT&G"[HOSTNAME]:[PORT]/[FILENAME]"**

Stream a file from an HTTP/FTP/GOPHER source on the internet. The header contains channel 0, file length, and an 8-bit sum of all the bytes in the forthcoming file, followed by the bytes of the file, all formatted as a normal packet. An ASCII 3 (CNTRL-C) received during the transfer will abort. The S44 register can be used to create artificial delays in this output. XON/XOFF Flow control also remains in effect with, on a byte-by-byte basis for the auto and manual flow control systems. Requires flash space for caching, or S45=3 to eliminate the SUM header.

## **AT&Y**

Reset the state machine string. No state machine will be executed.

## **AT&Yn**

Change the current state (for command mode AND current connection) to state n, where n is a decimal number.

## **AT&Y"[CODED STATE MACHINE]"**

Add the coded format string to a state machine. If this command is followed by a C, N, or A command on the SAME LINE, then the setting will apply ONLY to that connection or listener. State Machine Format: MMCCNN ... States are numbered by their order in the list starting with 00. Non-matches automatically go to the next state until a match is made. 'MM' is hex byte to match (or 00 to match all). 'c' is one of these commands :e=eat byte, p=push byte to que, d=send byte, q=send all queued, x=flush queue, r=replace with byte represented by hex CC. 'C' is either '-', one of the command letters above, or a hex byte value if the first command was 'r'. 'NN' is the next state to go to, with 00 being the first state.

# WiFi Modem Schematic

