TCPSER v1.0rc12-ssv6
Modem Emulator Software

User Manual

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CONTENT

1 INTRODUCTION

TCPSER turns a serial port into an emulated Hayes compatible modem that uses TCP/IP for incoming and outgoing connections.

It can be used to allow older applications and systems designed for modem use to operate on the Internet. TCPSER supports all standard Hayes commands, and understands extended and vendor proprietary commands (though it does not implement many of them).

TCPSER can be used for both inbound and outbound connections.

1.1 License

TCPSER is distributed under the GPL 2.0 or later

1.2 Conventions

Convention	Usage
bold	Important terms
`monospace`	Pathnames, Filenames, URLs, command lines and program code

Table 1: Conventions used in this Document

2 AT MODEM EMULATOR SOFTWARE

2.1 AT Commands

Command	Description
+	Overlook all following commands in this line
A	Answer incoming call, ring
O	Return online, answer ring
Bn	Select CCITT or Bell (n<1), dummy
Dn	Dial, followed by T = Touch Tone Dial, P =Pulse Dial, L = Dial last number
En	Echo commands to the computer (n = 0 off, n = 1 on)
Hn	Hook status (n = 0 hook, n = 1 unchanged)
In	Identification, (n = 0 product code, n = 3 software version)
Ln	Speaker loudness (1 <= n <= 3), dummy
Mn	Speaker control (0 <= n <= 3), dummy
Nn	Activate automode (automatic recognition of connection speed)
P	Set Pulse Dial as standard, dummy
Qn	Quiet mode (n = 0 off, n = 1 on)
Sn	Select register *n* as the current register
Sn?	Select register *n* as the current register, and query its value.
T	Set Touch Tone Dial as standard, dummy
Vn	Format result codes (n = 0 numeric, n = 1 text like “CONNECT” or “BUSY”)
Xn	Extended result code
Yn	Inactivity disconnect timer, dummy (also refer to register S30)
Zn	Reset modem, dummy
&Cn	DCD control (&C0 = permanent on, default, &C1 = at connection on)
&Kn	Data flow control (&K0 = none, default, &K3 = RTS/CTS, &K4 = XON/XOFF, &K5 = XON/XOFF+RTS/CTS
&Dn	DTR option, identically with S21 (&D0 = ignores DTR, default, &D2 = connection only when DTR)

Table 2: AT commands

Please note:
All unknown commands will be overlooked and answered with "OK".

2.2 Default Settings of S Register

Register	Default value	Description
S0	0	Number of rings before auto-answer
S2	43 ('+')	Escape character
S3	13 (CR)	Carriage return character (for all response messages and End of Command line)
S4	10 (LF)	Line feed character (for all response messages)
S5	8 (BS)	Backspace character (for deleting characters)
S6	2	Unused
S7	50	Unused
S8	2	Unused
S9	6	Unused
S10	14	Unused
S11	95	Unused
S12	50	Escape code guard time (fiftieths of a second, 50 = 1 second)
S21	0	Like &D0, with 0 DTR is ignored, with 2 calls are only answered when DTR is on.
S22	0	RI delay (n*10 Sec). If > 0, the output for CTS is also used as RI signal
S24	0	Delay between DCD and CONNECT message (n*10 milliseconds).
S30	0	Inactivity delay (n*10 seconds)

Table 3: S register definitions

Please note:
Only the used S registers are listed.

2.3 Program Parameters

Parameter	Description
-d	Serial device (e.g. /dev/ttyS0). Cannot be used with -v
-s	Serial port speed (default 38400)
-p	Port to listen on (default 6400)
-l	Loglevel (0 = NONE, 1 = Fatal, 2 = Error, 3 = Warn, 4 = Info, 5 = Debug, 6 = Enter/Exit, 7 = all)
-t	trace flags: (can be combined) 's' = modem input 'S' = modem output 'i' = IP input 'I' = IP output 'Y' = No Timestamp for syslog
-n	Add phone entry (number = replacement)
-i	Modem init string (defaults to '', leave off 'at' prefix when specifying) e0 Modem echo off (required for RCM and Linux prompt) s0 = 1 Answer incoming call after first RING s30 = 6 Hook connection automatically after 60 seconds of idle time
-P	Modem product code, String for response ATI

Table 4: Program parameters

2.4 Program Call

The program is called within the Linux start scripts and the parameters from the Web ConfigTool are added.

Example:

```
tcpser -d /dev/ttyAT0 -s 38400 -p 12345 -l 7 -tsSiIY \
-n "0,004999991111111=10.3.0.8:6400" \
-i "e0s0=1s30=6" -P "SSV GATEWAY"
```

3 CONNECTION CABLE

To connect the modem emulator with a terminal system a **crossed null-modem cable** must be used.

The numbers in the brackets are the pins of a 9-pole Sub-D connector.

Minimal version:

```
(8) CTS ------- RTS (7)
(7) RTS ------- CTS (8)
(3) SND ------- RCV (2)
(2) RCV ------- SND (3)
(4) DTR ------- DCD (1)
(1) DCD ------- DTR (4)
(5) GND ------- GND (5)
```

If the modem software needs DSR, it can be taken from DTR.

```
(8) CTS ------- RTS (7)
(7) RTS ------- CTS (8)
(3) SND ------- RCV (2)
(2) RCV ------- SND (3)
(4) DTR -----+- DCD (1)
(1) DCD -+    |
         |    +- DSR (6)
(6) DSR -+----- DTR (4)
(5) GND ------- GND (5)
```

Alternatively a single DTR can provide both sides with DSR.

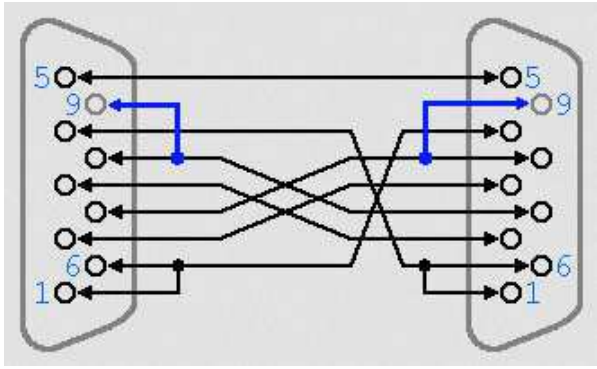
```
(8) CTS ------- RTS (7)
(7) RTS ------- CTS (8)
(3) SND ------- RCV (2)
(2) RCV ------- SND (3)
(4) DTR ------- DCD (1)
(1) DCD -+---+- DTR (4)
         |    |
(6) DSR -+    +- DSR (6)
(5) GND ------- GND (5)
```

IMPORTANT!
This cable is not symmetrical.

If RI is needed, CTS must be bridged with RI.

For this cable configuration the modem register S22 must be set to a value greater than 0.

```
(8) CTS -+----- RTS (7)
         |   +- RI  (9)
(9) RI  -+   |
(7) RTS -----+- CTS (8)
(3) SND ------- RCV (2)
(2) RCV ------- SND (3)
(4) DTR -----+- DCD (1)
(1) DCD -+   |
         |   +- DSR (6)
(6) DSR -+----- DTR (4)
(5) GND ------- GND (5)
```



4 PROGRAM VERSIONS

1.0rc12-ssv1:
Add option -P Name for modem product code response after "ati".
Add option -t..Y to suppressing timestamp in syslog.
Skip all AT+ sequences.
Add register S24 for DCD-CONNECT delay.
Handle &Dn mode set, store state in S21 (internal register), default &D0.
Connect incoming calls only if DTR is high, based on &D2.
Limit rings for S0 = 2.

1.0rc12-ssv2:
Use Toggle RI while sending RING via RTS/CTS, if enabled with register S22.

1.0rc12-ssv3:
Trim spaces from phone book.

1.0rc12-ssv4:
Do not send <LF> after <CR>, if in numeric mode (ATV0).
Do not send <CR><LF> before "OK", if echo is disabled (ATE0).

1.0rc12-ssv5:
Translate phone number "ATD99aaabbbcccddd" into IP address aaa.bbb.ccc.ddd:6400 or "ATD*a+b+c+d+p" into a.b.c.d:p.

1.0rc12-ssv6:
"AT&K3" has set RTSCTS+XON/XOFF, instead RTSCTS only. To use RTSCTS in older versions please do not send "&K3".
Simple do not change, because handshake RTSCTS is default.
"ATI3" answers software version, "1.0rc12-ssv6" in this case.

5 HELPFUL LITERATURE

- http://en.wikipedia.org/wiki/Hayes_command_set (Hayes command set)
- http://www.messagestick.net/modem/Hayes_Ch1-3.html (S register listing)
- http://support.microsoft.com/kb/164660 (AT command overview)

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DOCUMENT HISTORY

Revision	Date	Remarks	Name	Review
1.0	2016-03-03	first version	WBU	HNE