

User Guide for NewTELnet 9200

Version 3

John Read,
NewNet Marketing
Waldweg 15
83558 Maitenbeth
Germany
Tel: +49-8076-8879818
email: info@newnet-marketing.de

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Figure 1: Main window when offline

1 Overview

NewTELnet9200, the TELNET terminal emulator, is the ideal tool for the system manager to access his system remotely and work interactively via the command line. He does not need to be near his office, or even have a power plug near him. He just uses the TELNET connection via the TCP/IP stack in the Communicator 9210/9290. NewTELnet9200 has been fully tested with all the standard LINUX utilities, and supports all major escape sequences. The newTELnet application from **NewNet Marketing** for the Communicator gives remote access to a system via Internet connected over the mobile telephone. Another important feature is connecting via the serial port, which is supported for direct connection to a host at baud rates up to 115Kbps. This is often used to configure network switches, and microcomputers via their console ports.

NewTELnet 9200 is compliant to all the important ANSI, VT100, VT2xx, VT52, TVI950, WYSE60, and ADM3A escape sequences and is therefore ideal to access a remote LINUX, or any other UNIX system.

Figure 1 shows newTELnet9200 after starting. The program version and registration status are shown at the bottom of the main window. The CBA buttons on the right can be set to meet the user convenience to either send texts, or perform commands.

NewTELnet9200 has been fully tested against most "escape sequence heavy" applications, eg. Top - the system display, Joe - the editor, Pine - the e-mail client. In figure 2 you can see a running session connected to a remote LINUX system.

The screen on the PDA is typically smaller than the complete terminal screen, and this will mean that the user must scroll to be able read all the screen content. This can be done by either using the direction block whilst pressing the *Chr* key, or automatically using the "follow" mode.

The received, and transmitted data can be dumped into a trace file, for a complete analysis, should problems occur. This data can be stored either in an easily readable format, or in an image copy of the received data. This second form allows the file to be used for a replay at a later date.

Control characters, e.g *Ctrl-C*, can be entered directly in newTELnet9200. In addition to this, hotkeys are defined for easy access of standard texts. These hotkeys are preloaded with the F1..F10, but can be changed by the user.



Figure 2: Connection to remote system

To ease the entry of standard text blocks, these can be stored in buffers within newTELnet9200 for direct entry, and selected onto one of the CBA buttons. Commands or stored texts can be placed on the CBA buttons. Two sets of buttons are available, and these change when the *ctrl* key is pressed. This gives a total of 8 buttons that can be used for quick entry of texts or commands.

The last command that was entered from the keyboard can be easily recalled by pressing the recall button, this function is normally called being linked to a CBA button.

NewTELnet9200 is available as a shareware program both in English and German. The shareware version is fully functional with an additional information screen displayed when going online. This screen disappears after the registration code has been entered. The registration is done easily via one of the online registration companies listed on our web site <http://www.newnet-marketing.de> or directly there online.

2 Features of newTELnet9200

2.1 History Screen

A history screen can be selected to display the data collected since the program was started. The history is limited to a maximum size, which can be set by the user. The history collection can be enabled, or disabled per default via the "History" menu found under "Capture".

The default mode records all data received, and attempts to format the text in an approximation to the original data. This is, however, not possible when the data was formatted by direct cursor addressing.

When full mode is selected, then all data sent and received will be recorded. The data will be expanded so that all binary data can be analyzed. This mode is normally only used for debugging purposes.

To display the data in the history select the "display history" menu, or press the "history" CBA button. A new screen will appear covering the terminal window showing the text stored in the history buffer. It will be noted that escape sequences are not processed on this screen as it is not a terminal emulation. They are, however, removed from the text, when collecting in default mode.

If you wish to copy the data into the clipboard for use within other applications, you can either select sections of the text by pressing up-arrow and the direction key, or you select all the text by using the CBA button. The selected text can be copied into the clipboard by pressing the CBA button "copy".

To return to the default operation this screen must be removed. To do this just press the CBA button "close". The buffer contents are not removed, and will continue to fill unless cleared, or turned off.

The history buffer will fill to the maximum level, and will then stay at this size. To clear the history buffer, press the "clear" CBA button. The screen will then be cleared, and the data will be at the start of a new buffer

2.2 Escape Sequences

NewTELnet9200 supports the ANSI standard escape sequences including the colour formatting statements.

- In ANSI mode, newTELnet9200 will also process any DEC VT200 control sequences. This mode is shown as ANSI/VT2xx.
- VT100 , VT52 , TVI950 , WYSE60 , and ADM3A are not compatible to each other, and must be selected via the menu.

2.3 Scrolling within the Terminal Screen

The PDA screen is smaller than the corresponding terminal screen. This will probably mean that you can only display a part of the emulated terminal on the newTELnet9200 screen, depending on the selected font size. To scroll within the terminal screen press the *Chr* key whilst using the direction block.

When the "follow" mode is selected, either from the menu or a button, then the screen will always scroll to display the cursor. This can, depending on the the remote application, ease user entry considerably, and is described in section 2.9.

2.4 Definition of the Cursor Keys

The cursor key escape sequences for the various terminal types, stored in newTELnet9200, normally work with most remote products. However, sometimes they have to be modified for special needs. They can be directly edited in the dialog. All control characters can be entered by using the entry methods as shown in Figure 1.

2.5 CBA Buttons

The buttons on the right of the screen are linked to either stored text buffers, or functions. The menu "buffers", under the main point "buffers", will show you the links at present, and allow you to change them. Each button can be linked to either a stored text, or a command.

There are 2 sets of buttons, allowing a total of 8 buttons to be allocated. During normal operations pressing the *ctrl* button will select the second button set.



Figure 3: Autoconnect icon on desktop

2.6 Hot Keys

The buttons *ctrl+chr+1..10* will automatically send a stored string. The default string is the ANSI F1..F10 escape sequences. The string can, however, be changed to store any other.

A typical use for one of these hotkeys is to store the UNIX *"pipe"* character, which cannot be entered directly from the Nokia Communicator keyboard.

Note The UNIX *"pipe"* command can be easily stored and sent from a hotkey. An example of storing the *"pipe"* command in hotkey 1: Using Menu-Buttons - *"Stored Codes"* (as described in section 2.8, change text in field *"Hot1"* to `\x7C`. The *"pipe"* character can now be sent by pressing *Ctrl+Chr+1* simultaneously.

2.7 Saving a Configuration to the Desktop

A automatic connection, or an answering configuration can be saved to the desktop using a user defined name. By clicking on the icon that will appear on the Communicator *"desktop"* newTELnet9200 can be started, and will automatically use the stored parameters and then connect to the remote system. Figure 3 shows the newTELnet9200 icon that will be created. When this desktop icon is then clicked, the connection or answer mode will be automatically started.

2.8 Entering Stored Texts

To ease the entry of standard texts, these can be stored in newTELnet buffers, and then linked to the CBA buttons. There are 8 buffers in total. The text will be sent to the host when the button is clicked.

The menu allows entry of special keys, eg. escape, carriage return, etc. by using the standard C-syntax. Figure 1 lists the special keys, and their meaning.

Note: If the stored text is to be used as a command for the system, it will probably need to be terminated with carriage return *"\n"*;

description	entry
Escape character	\e
Carriage return	\r
New line	\n
Tabstop	\t
Backslash	\\
Any character	\xnn where the nn is the hexadecimal value of this character.

Table 1: Special Keys for control character entry

2.9 Autocursor

The cursor "follow" function will automatically scroll the window so that the cursor is in the visible section. This can be selected via the menu, or a button. Depending on the host software, this can either be an advantage, or cause irritation. Some software always moves the cursor to the bottom of the screen, even though the important data is at the top, in this case the autocursor function should be disabled.

2.10 Recall Command Line

Most commands entered for the remote system are terminated by a carriage return key (*CR*). The recall function within newTELnet9200 automatically stores strings sent in this way, and allows them to be resent by simply pressing the "Recall" button. This function is only available as a CBA button, so it must be selected via the "Buttons" menu before being used.

When the command line is recalled via the "Recall" button, the *CR* is not sent. This allows the user to edit, or cancel the line before it is performed by the remote system.

2.11 Data Capture and Replay

All data can be stored in a capture file to assist debugging, or for documentation purposes. This is turned on by selecting the Capture menu, and selecting a suitable file name. The following modes are available:

The normal mode only records the received data, and expands any control characters to assist analyzing the received data.

The full mode records the data sent out, and control characters in addition to the data recorded in normal mode.

The image mode is used to store the received data in a format that can be used later for a replay.

To replay a session, the file must be selected from within the Replay menu. The characters stored in the file will be displayed on the terminal screen.

2.12 Registration

newTELnet9200 is a shareware application. This allow users to fully test it before deciding whether it is useful to them. When the user decides to register, then this

must be done via **NewNet Marketing** (<http://www.newnet-marketing.de>), or one the registration partners. A complete list of partners is available on the **NewNet Marketing** web-site.

For a single-user license, the 9200 Communicator IMEI number, and a user name need to be entered during the registration. The IMEI number identifies the 9200 Communicator, and the user name will appear on the main page of newTELnet9200.

The 9200 Communicator IMEI number can be easily got by entering the following characters on the Communicator telephone keypad: *#06#. The IMEI number then appears on the 9200 Communicator display.

NewNet Marketing will then send the user a newTELnet9200 registration code and user name via e-mail which is specifically valid for this 9200 Communicator. Should the IMEI code change after registration, perhaps due to Communicator upgrade, then just send an email to register@newnet-marketing.de with the new IMEI number.

The user name and registration code should be entered in the "registration" dialog found in the "Tools" menu. The main page should now display the user name instead of the "unregistered version" text. It is not necessary to reinstall, or update newTELnet9200 for this registration, however, it is wise to use the latest version, which can always be found at the **NewNet Marketing** web-site (<http://www.newnet-marketing.de>).

NewNet Marketing has a policy of free upgrades for their products. This means that any upgrades for newTELnet9200 that become available can be installed without having to re-register the application. When additional features become available within the product that were not available at the time of registration, it is, however, possible that an update registration might be requested before using these new features.

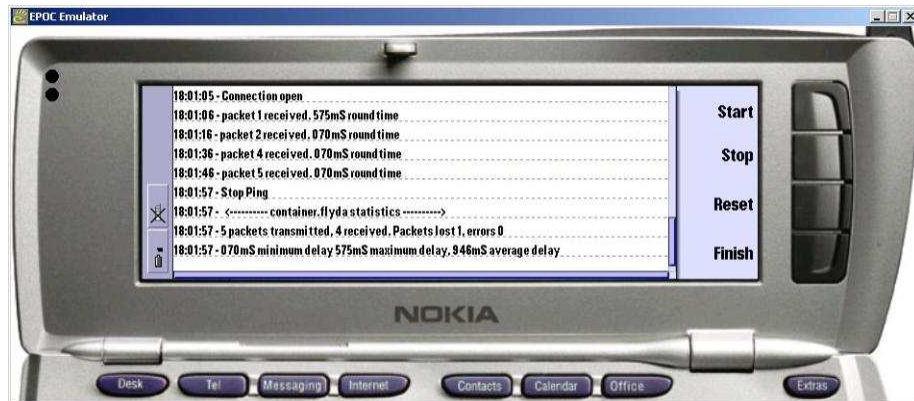


Figure 4: Ping Screen

3 Special Modes

3.1 Ping Mode

The Ping mode is a completely independent mode selected from the "file" menu entry "Ping". When in this mode, all operations refer to "Pinging" a remote host. The standard mode must be reentered before the TELNET or serial terminal connectivity functions can be used by pressing the "Finish" CBA button.

Tip: Before attempting to start a PING to a remote host for the first time, check that the "Internet Access Point" is correctly set up by accessing the internet using the Communicator www-browser.

The PING is started by pressing the CBA button "Start". A dialog will then allow a remote host name, or address. The PING will then start the connection, and will print all the results on the screen. After completing the PING, it will complete and return to the STOP status.

There are several menu commands that can be selected in this mode, including the "Capture" functions, and "select all" to copy the screen contents into the clipboard so that they can be pasted into another application.

The parameters for the PING can be set with the "Parameters" menu selection. This includes the length of data that should be sent, the number of ICMP packets that should be sent to the remote host before automatically stopping, and the time interval in milliseconds between each packet that is sent out.

For each entry shown on the screen, there is a timestamp showing the time (as set in the Communicator 9200) at which the packet or event occurred. The events that will be seen at first document the startup of the link into the Internet. All output to the screen will be added at the bottom of the screen. Should it be necessary, then scrollbars will be added at the bottom, and right of the screen to allow the user to scroll back to text which is no longer visible. The screen can be cleared by pressing the "Reset" CBA button.

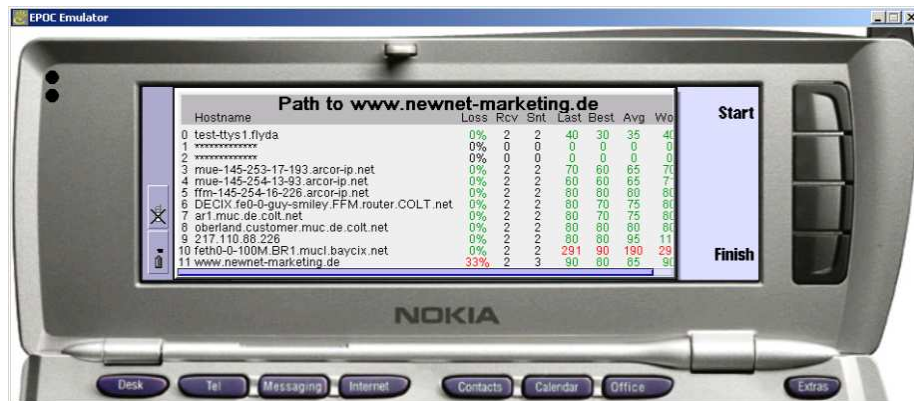


Figure 5: Path Screen

3.2 Trace Route Mode

The TraceRoute, or Path mode is a completely independent mode selected from the "file" menu entry "TraceRoute". When in this mode, all operations refer to displaying a Path to a remote host. The standard mode must be re-entered before the TELNET or serial terminal connectivity functions can be used.

Tip: Before attempting to trace a path for the first time, check that the "Internet Access Point" is correctly set up by accessing the internet using the Communicator www-browser.

The path to the remote host will be detected using ICMP packets, and various TTL values. This relies on responses from the hosts found on the path. If a host does not respond with any useful information e.g. IP address, then it will be entered as "*****" and will not be accessed any more afterwards. Some hosts reply to the ICMP packets, but do not have a registered IP name. They will therefore be displayed on the TraceRoute screen with their IP address. Due to security concerns, some remote hosts will not respond to the ICMP packets. In this case the PATH will be incomplete.

The TraceRoute runs in 2 separate steps. First the path is detected, and then afterwards the hosts found in this path will be pinged continuously to list their round time delays. This will continue until stopped by the user, using the CBA-button "Stop".

The path entries which are found will be listed under the following columns:

Hostname The hostname is the name or address of the host found at this hop in the path. If there is no answer, or an illegal answer for this entry in the path, then "*****" is entered at this position.

Loss The percentage loss of packets lost, or not returned from this host. This will always show a percentage loss, when waiting for a packet from this host, and this shows the node that is being pinged at present. The colour of this entry will vary depending on whether it is classified as "ok", "warning", or "bad". The levels, and colours can be set in the "parameters" menu entry.

Rcv The number of ICMP packets received back from this host.

Snt The number of ICMP packets sent to this host.

Last The round time in milliseconds measured for the most recent ICMP packet sent to this host. The entry color is defined in the "parameters" menu, for the categories "ok", "warning", or "bad".

Best The lowest round time in milliseconds recorded for an ICMP packet sent to this host. The entry colour is defined in the "parameters" menu, for the categories "ok", "warning", or "bad".

Avg The average round time in milliseconds for ICMP packets sent to this host. The entry colour is defined in the "parameters" menu, for the categories "ok", "warning", or "bad".

Worst The highest round time in milliseconds recorded for an ICMP packet sent to this host. The entry colour is defined in the "parameters" menu, for the categories "ok", "warning", or "bad".

The path as listed on the screen can be collected into a capture file. This capture is started by using the "Capture" menu and selecting the file name in which to collect the data. After finishing operation in this mode it is simple to return to the default mode. Just press the CBA button "Finish", or select the "return" menu entry.

Note: This Trace Route feature is new in newTELnet9200 V3. It is therefore not part of the license obtained before this version (Version 1, or 2). Users who registered a Version 1, or 2, will have a screen displayed to them when they start using the TraceRoute mode informing them of an upgrade license which can be easily obtained from <http://www.newnet-marketing.de>. The Trace Route feature can be fully tested using the V1, or V2 license, but will stop at the end of the test period.

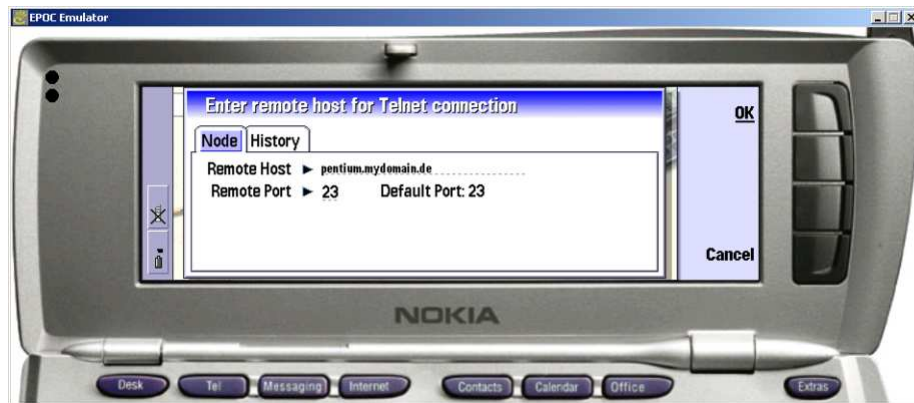


Figure 6: Remote connection dialog

4 Important Dialog Screens

4.1 Connecting to the remote host

The connection mode must first be selected with the menu "Terminal". Via the "Connection Setup" menu, you will be able to select either the serial port, or the TELNET connection. When using the serial port it is important to note that the baud rate, flow control, etc. must be correctly set to conform to the remote host.

Before the TELNET connection can be used, the "Internet Access Point" must be set up. The dialog page to do this will be found under "Internet Access" on the Communicator 9200 control panel. This entry is also necessary for the Communicator mail, and www-browser applications.

Tip: Before attempting to start a TELNET connection for the first time, check that the "Internet Access Point" is correctly setup by accessing the internet using the Communicator www-browser.

The multi-page dialog is shown in figure 6. The connection is started by either pressing the menu "connect", or using the CBA button. A connection dialog will then appear where all the data needed for the connection can be entered. The first page of this dialog shows the current remote host name or address, and allows the name, or address to be edited. The remote port can also be entered in this dialog. This has a default value of 23, and does not normally need to be changed.

All host names or addresses, and their complete parameters are stored in a history. Up to 30 entries can be stored, and directly selected from the "previous hosts" dialog page. The entry from the history should be selected by pressing the "select entry" CBA button. By pressing the "main page" CBA button, you can switch directly back to the main page displaying the current telephone number.

4.2 Connection Setup Dialog

This dialog sets general parameters for the connection to the remote host. On the main page, the serial or TELNET connection can be selected.



Figure 7: Previous remote hosts

If the serial port is selected, then the serial parameters, and handshaking should also be set to match the characteristics of the remote system.

Note: Please note that the serial port can only work when the standard Nokia DLR-2L cable is plugged into a remote RS232-C connector supplying power for the active components in the cable.

The "Telnet" page of this dialog is used to set the holdback time, which is the time for which a packet will be held back before being sent to the host. If the user is entering data via the keyboard, then this will allow packets sent to the host to be better filled. Increasing the wait time will improve the packet filling, but will make data entry very slow. The host can request the terminal type from newTELnet9200. NewTELnet9200 will answer with the terminal type set in the terminal dialog (e.g. ANSI, VT100, etc). If newTELnet9200 should answer with a different terminal type name, then this can also be entered in this page.

4.3 Buttons Dialog

Figure 8 shows the dialog which should be called to define the functions performed when CBA buttons are clicked. The CBA buttons on the right-hand side of the Communicator can be programmed from this dialog to either send stored texts to the remote host, or perform commands.

There are 2 sets of 4 buttons, and the user switches between the 2 sets by pressing, or releasing the *ctrl* key. This allows a total of 8 buttons for easy entry of important host commands, newTELnet functions, etc.

For each button, there is a roll-down list to allow the user to select either a stored text (1 - 8), or a command to be placed on this button. When the command or text has been selected, the title of the stored text or the command name will afterwards appear next to the button on the screen to make selection easier.



Figure 8: Buttons Dialog

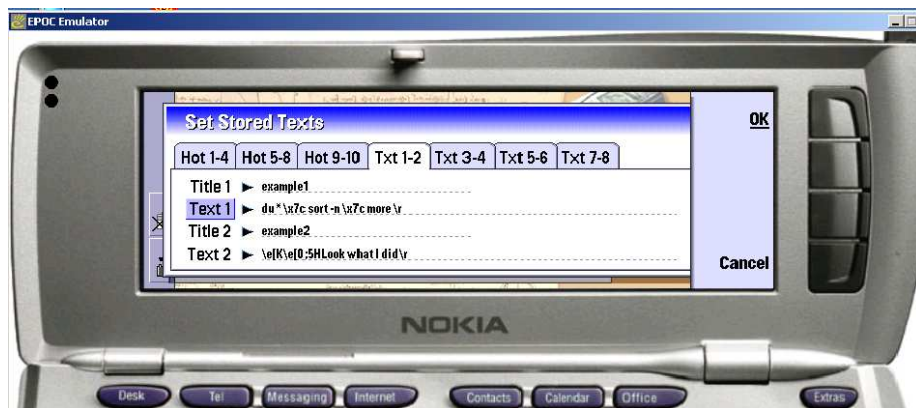


Figure 9: Stored Texts Dialog

4.4 Stored Texts Dialog

The texts that should be sent to the remote system when the hot-key or button is pressed, are set in the "Stored Texts" dialog, shown in Figure 9. There are 10 hot-key buffers available in newTELnet9200, these are preloaded with the escape sequences for F1 .. F10. They can, however, be reloaded with any other text up to a maximum length of 254 chars.

Note The F1..F10 control sequences are not standardized, and might have to be set to a different value to communicate with your system.

The hot-key texts are sent when the hot-keys are pressed, as described later in section 2.6.

The 8 Stored Texts can also be inserted, and edited using this dialog. A title is allotted to each text. This title will appear next to the CBA button when it is selected as a button using the "Buttons" Dialog, described in Section 4.3. The title text shown next to the CBA button can be split into 2 lines by inserting the control character "\n" in the position of the string where the line break should occur.

Control characters can be entered into both the hot-key and the stored text buffers in a simple C-like syntax. This is described in section 2.6.

5 Specification

Screen: max. 132 x 44, min 40 x 10, default: 80 x 24, ANSI colour functions

Escape sequences: ANSI, VT2xx, VT100, VT52, TVI950, WYSE60, ADM3A

Scrolling: by using the direction block and *chr*

Serial: up to 115200 bps, 7, and 8 bit ASCII

Hotkeys: default settings for F1 .. F10.

Stored texts: 8 buffers with their titles, 254 chars. max. length of text including control characters.

CBA buttons: 2 sets of 4 buttons, all selectable for either stored text, or a command. The sets are switched when the user presses *chr* key.

Charset: IBM1252, David (for David software)

Trace file: to assist fault finding. Normal, Full, and Image mode supported.

Replay: of previous image capture.

Recall: last entered command will be resent to the remote system.

History: The default mode stores all received data, which can easily be seen by displaying the history screen. The History can also store all the data sent, and received in Full mode to assist in fault finding.

Table 2: ANSI codes sent from keyboard

Key	Control Function	Comments
Cursor Left	CSI D	
Cursor Right	CSI C	
Cursor Up	CSI A	
Cursor Down	CSI B	
Page Down	CSI 6	
Page Up	CSI 5	
Home	CSI 1	
End	CSI 4	
F1	CSI OP	Can be modified at any time
F2	CSI OQ	Can be modified at any time
F3	CSI OR	Can be modified at any time
F4	CSI OS	Can be modified at any time
F5	CSI [6	Can be modified at any time
F6	CSI [17	Can be modified at any time
F7	CSI [18	Can be modified at any time
F8	CSI [19	Can be modified at any time
F9	CSI [20	Can be modified at any time
F10	CSI [21	Can be modified at any time

Table 3: Character translation in Special Graphics Mode

Input char	Output	Comments
0x71	0x97	Horizontal line
0x78	0x7C	Vertical bar
0X7D	0XA3	Pound sign
0X6A, 0X6E, 0X74, 0X77	0X2B	Corners (top left, top right, bottom left, bottom right). These are completely replaced by a plus sign as there are no graphic symbols available in the fonts.

Table 4: ANSI and VT100 supported escape sequences

Escape code	Name	Description
CSI Ps ; Ps m	SGR Select Graphic Rendition	This control sets one or more character attributes at the same time.
CSI Pt ; Pb r	DECSTBM Set Top and Bottom Margins	This control function sets the top and bottom margins for the current page. You cannot perform scrolling outside the margins.
CSI Ph A	CUU - Cursor Up	Moves the cursor up a specified number of lines in the same column. The cursor stops at the top margin. If the cursor is already above the top margin, then the cursor stops at the top line.
CSI Ph B	CUD Cursor Down	This control function moves the cursor down a specified number of lines in the same column. The cursor stops at the bottom margin.
CSI Ph C	CUF Cursor Forward	This control function moves the cursor to right by a specified number of columns. The cursor stops at the right border of the page.
CSI Ph D	CUB Cursor Backward	This control function moves the cursor to the left by a specified number of columns. The cursor stops at the left border of the page.
CSI Ph E	CNL Cursor Next Line	Move the cursor to the next line.
CSI Ph F	CPL Cursor Previous Line	Move the cursor to the preceding line.
CSI Ph G	CHA Cursor Horizontal Absolute	Move the active position to the n-th character of the active line.
CSI Pl ; Pc H	CUP Cursor Position	This control function moves the cursor to the specified line and column.
CSI Ph I	CHT Cursor Horizontal Tabulation	Move the active position Forward n tabs forward
CSI Ps J	ED Erase in Display	This control function erases characters from part or all of the display. Ps = 0, From Cursor through the end of display; Ps=1, From beginning of the display through the cursor; Ps=2, The complete display.

CSI Ps K	EL Erase in Line	This control function erases characters on the line that has the cursor. Ps=0, From the cursor to the end of the line; Ps=1, From the beginning of the line through the cursor; Ps=2, The complete line.
CSI Ph L	IL Insert Line	This control function inserts one or more blank lines, starting at the cursor.
CSI Ph M	DL Delete Line	This control function deletes one or more lines in the scrolling region, starting with the line that has the cursor.
CSI Ph d	VPA Vertical Line Position Absolute	Move to the corresponding vertical position of the current column.
CSI Ph T	SD Pan Up	This control function moves the user window up a specified number of lines in page memory.
CSI Ph S	SU Pan Down	This control function moves the user window down a specified number of lines in page memory.
CSI Ph @	ICH Insert Character	This control function inserts one or more space (SP) characters starting at the cursor position.
CSI Ph P	DCH Delete Character	This control function deletes one or more characters from the cursor position to the right.
ESC 6	DECBI Back Index	This control function moves the cursor backwards one column.
ESC 9	DECFI Forward Index	This control function moves the cursor forwards one column.
ESC D	IND - Index	IND moves the cursor down one line in the same column.
ESC M	RI Reverse Index	RI moves the cursor up one line in the same column.
ESC E	NEL Next Line	Moves cursor to first position on next line.
CSI u	SCORC Restore Saved Cursor Position	Moves cursor to the position saved by save cursor command.
CSI s	SCOSC Save Current Cursor Position	Save current cursor position.
ESC =	DECKPAR	Null
ESC (DEC SCSG0	Select Graphic mode 0
ESC)	DEC SCSG1	Select Graphic mode 1
ESC *	DEC SCSG2	Select Graphic mode 2

ESC +	DEC SCSG3	Select Graphic mode 3
ESC Z	DEC ID- Identify device	Reply with identification string
CSI c	DA1 Primary Device at- tributes	Reply with Attributes

1. CSI is the control sequence introducer. For the 7-bit sequences used by newTELnet 9200, this is replaced by ESC followed by [
2. Ps, Pt, etc. are integer parameters.

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