



User's Guide V8.02



A Uniterm engineered and
manufactured product



Table of Contents

1. GETTING STARTED	4
Introduction	4
Hardware Setup	4
Back Panel Connections	5
Connector Pin Assignments	5
2. BASIC OPERATION	6
Ethernet	6
Serial	7
Hotkeys	7
Line Monitor	8
Serial Communication Flow Control	8
3. AUXILIARY DEVICES	10
Printer Interface	10
Through Printing	11
Network Printing - LPD	13
TCP/IP Socket Printing (Rawport)	15
Barcode Scanner Interface	19
Terminal Server	19
Auxiliary Serial Devices	20
4. CONFIGURATION	21
Using the Setup Program	21
Comms Menu	22
Comms Parameters	22
TCP/IP Parameters	24
Host Names	25
Socket Parameters	26
Telnet TCP Port Numbers	27
Ethernet Parameters	28
Ports Menu	29
Flags Menu	31
Misc Menu	34
General Menu	36
Console Menu	38
Emulate Menu	41
Keys Menu	42
Programming the Keys	42

5. ANSI EMULATIONS	44
Controlling Terminal Modes	45
Assigning Character Sets	45
Selecting Terminal Personalities	46
Controlling Cursor Movement	46
Editing Functions	47
Controlling the Keyboard	48
Controlling the Screen Display	49
Transmission/Printer Control	49
Terminal Reports	50
Controlling Attributes	50
Colour Table	50
Select Graphic Rendition (SGR) Chart	51
ANSI Emulation Programmable Keys	52
6. VT52 EMULATION	55
Cursor Movement Commands	55
Character Set Selection	55
Editing Commands	55
Terminal Control	55
Auxiliary Port Control	55
VT-52 Programmable Keys	56
7. ASCII COMMANDS	57
Selecting terminal Personalities	58
Terminal Controls	58
Host Communications	58
Keyboard Controls	58
Display Message fields	59
Defining the Data Area	59
Cursor Control	59
Screen Memory and Screen Pages	60
Editing Functions	60
Clear Screen Display	61
Transmission to Host	61
Printer Control	61
Display Attributes and Data Protection	62
Variable Values for ASCII Commands	63
Programmable Keys	64

1. GETTING STARTED

INTRODUCTION

The Easitext is a compact character cell / text based data terminal. The Easitext logic unit interfaces with any IBM PS/2 compatible keyboard and VGA monitor.

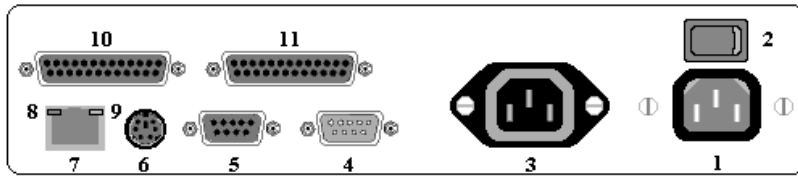
Supporting Ethernet TCP/IP and RS-232 Serial communications the Easitext is ideally suited to a wide variety of text based applications, in particular, the emulations have been optimised for use with UNIX operating environments.

The Easitext has the ability to emulate several ASCII, ANSI and PC terminal personalities and has extensions to support advanced features provided by the SCO UNIX environment. IMS Real32 TCP/IP is also supported.

Versatile network printing capability featuring LPD and TCP/IP Socket printing is available.

HARDWARE SETUP PROCEDURE

- Remove the logic unit and mains power cable from the packing carton and set the logic unit on a flat work surface.
- Ensure the mains power switch located on the back panel is in the off position.
- Insert the Easitext power cable into the wall plug and into the mains inlet. The terminal is now earthed through the power cable.
- Attach the video monitor power cable to the power source.
- Attach the video signal cable.
- Attach the keyboard connector.
- Attach the network or serial communication cable.
- If a printer is to be used ensure that the printing device power cable is plugged into a mains power socket and that the printing device is powered down prior to attaching the printer data cable to the Easitext.
- Power up the terminal.



ID	Function	ID	Function
1	Mains Inlet	7	10BaseT Ethernet
2	Power Switch	8	LAN Link Indicator
3	*Mains Outlet	9	LAN Activity Indicator
4	Serial COMM2	10	Serial COMM1
5	VGA Monitor	11	Centronics LPT1 Port
6	PS2 Keyboard	12	Cash Drawer Interface (optional)

BACK PANEL CONNECTIONS

* The Easitext Power Supply Module mains inlet and mains outlet are protected with an X and Y crowbar circuit. Mains Line and Neutral each have an in line 2,5Amp fast blow fuse. "Hot" plug in of the video monitor power cable is not advised. Follow the Hardware Setup Procedure.

Function	In/Out	DSub 25	DSub 9
Transmit Data (TX)	O	2	3
Receive Data (RX)	I	3	2
Request To Send (RTS)	O	4	7
Data Set Ready (DSR)	I	6	6
Signal Ground	I/O	7	5
*Auxiliary Power	O	9	9
*Auxiliary Power	O	10	
Data Terminal Ready (DTR)	O	20	4

CONNECTOR PIN ASSIGNMENTS

* Power supply for an auxiliary device can be made available on the serial port D-Sub connectors through a jumper setting on the motherboard. Unregulated 7V or regulated +5V is available. A maximum current of 500mA is available.

2. BASIC OPERATION

The Easitext can be configured to operate using Ethernet or RS232 Serial physical communication medium. Certain system level functions, and operations requiring a Hotkey sequence to activate are discussed in this chapter.

ETHERNET

At power up the system defaults to console session 1 the user navigates to the required console session / host computer. When the 'Enter' key is pressed the Easitext commences establishment of a Telnet session with the host computer. The sequence of events is as follows:

The IP address of the remote host is retrieved from the terminal configuration data.

Determine the Remote Host MAC (Ethernet) address using the Address Resolution Protocol (ARP).

If successful save the MAC address in the Easitext ARP table. Establish a TCP/IP connection with the Telnet port at the Remote Host.

The tty type terminal emulation used is conveyed to the host computer from within initialisation of the Telnet protocol.

The terminal is immediately placed into an operative mode and will begin accepting keystrokes and interpreting received characters

Additional Telnet sessions can be opened with the same host computer or a number of different remote host computers.

At all times the Easitext terminal listens for ICMP (ping) requests and ARP requests.

If the Easitext is configured for Line Printer Daemon (LPD) operation, the terminal creates 2 TCP/IP sockets and

continuously listens for TCP/IP Sync (connection) with these LPD ports.

If the Easitext is configured for TCP/IP Rawport functionality, the terminal continuously listens for TCP/IP Sync (connection) with these Rawports.

SERIAL

At power up the Serial Port receive character ring buffers and 32 byte FIFO UART buffers are flushed.

If the Silent Entry feature is not set, the terminal will expect a key press, if set, no key press if expected.

The terminal is immediately placed into an operative mode and will begin accepting keystrokes and interpreting received characters.

HOTKEYS

Certain keystroke sequences invoke dedicated Easitext system functions. Listed below are hotkeys which are hard coded into the embedded firmware and are excluded from the 96 user programmable function keys.

Alt F1 through Alt F6 (Network)

Selection of console session 1 through 6 connected to remote host 1 through 6 as defined in Setup > Comms > Network.

Ctrl Backspace (Network)

This key combination displays the session names as defined in Setup > Comms > Hosts.

Alt F11 Alt F12 (Serial)

Allows multi host selection when configured in Setup > General > MultiScreen. Alt F11 displays console1 connected to host1 on comm1 and Alt F12 displays console2 connected to host2 on comm2.

Ctrl Printscreen

Enables a printed copy of the current display console. As new characters are displayed on the video console these

characters will also be printed. This function has a toggle action, pressing this key sequence for the second time will disable this action.

LINE MONITOR

A useful debug tool allows examination of data received by the Easitext. Any data received via the configured active port is displayed on the system console or sent to the printer port according to the configured line monitor mode.

In Console display mode when the console is full of debug data the terminal does not scroll, the system bell will be sounded and the terminal waits for a keypress. On detecting a key press the display console is cleared and new data can be displayed in any of the following modes:

ASCII
HEX
HEX/ASCII
PRN ASCII
PRN HEX
PRN HEX/ASCII
PRN ASCII CR/LF
PRN HEX CR/LF
PRN HEX/ASCII CR/LF
PRN RAW

(See Chapter 4 Flags > Monitor Line Output)

SERIAL COMMUNICATION FLOW CONTROL

Data flowing between the configured active port of the Easitext and the host machine is controlled by either hardware or software flow control (handshake).

The terminal operates at baud rates between 50 and 115200 baud. However, under certain conditions, the terminal may be unable to process received data at the host's rate of transmission. Incoming data is stored in a ring buffer and processed by the emulation software on a First In First Out basis. Flow control is required to prevent data loss due to buffer overruns.

The Easitext supports Xon-Xoff software flow control and hardware flow control (handshaking) and a combination of hardware and software flow control.

Receive Flow Control

When the receive buffer is almost full, dependant on configuration Setup > Comms > Comms 1(or2) > HandShake the terminal transmits either the Xoff character 13 (hex), or disables the hardware control line.

On this signal, the host should suspend data transmission to the terminal. If the host fails to respond to a Xoff or a hardware disable from the terminal in a timely manner, the terminal receive buffer will overrun and data will be lost. When the host suspends transmission, the terminal continues to process characters in the receive buffer.

When the receive buffer is nearly empty, the terminal transmits an Xon character 11(hex), or enables the hardware signal to allow the host to resume transmission.

Manual Flow Control (Xon-Xoff)

The user may manually suspend transmission from the host computer by transmitting the Xoff character (Control-S), and resume the transmission by transmitting the Xon character (Control-Q).

Transmit Flow Control

In the event of the host computer or an auxiliary device requesting the terminal to suspend transmission and dependant on the configuration an Xoff character 13(hex) or a hardware disable control is received from the remote device.

Setup > Flags > COM1(or2) Tx Handshake

The terminal will suspend output until the remote device transmits an Xon character 11(hex) or hardware control is enabled.

3. AUXILIARY DEVICES

The Easitext is capable of supporting a variety of auxiliary devices. Interface to these devices is through the keyboard port, parallel port and serial ports.

The printer driver software referred to in this chapter is available from the Uniterm web site. Ready compiled executables for SCO (Openserver 5 & Unixware 7) and most distributions of Linux are available.

PRINTER INTERFACE

The Easitext can support printers connected to the Centronics parallel port and the RS232 serial ports.

The Centronics interface has no settings. A printer timeout setting is available for LPT1.

Setup > General > Printer Timeout Minutes

Serial printing will require the serial port protocol to be configured compatible with the attached printer serial interface.

Setup > Comms > Comm1 or Comm2 for serial port configuration.

Serial printer handshaking is available if required.

Setup > Flags > COM1(or 2) Tx Handshake

Consideration must be given to the receive buffer size of the attached serial printer.

Setup > Flags > COM1(or 2) Tx Buffering

Serial printers with small receive buffers set to FIFO OFF.

Print Server applications can be made simple by removing the keyboard.

Setup > Keyboard Interface > Detect

THROUGH PRINTING

This method uses escape sequences received from the host computer which direct print characters to the printer port and once the print job is complete an alternate escape sequence directs the received characters to the display console.

The default Through Print port configuration is set to LPT1.
Setup > Ports > Through Printing

The Through Printing mechanism is further enhanced with a 32Kb onboard print buffer attached to LPT1.
Setup > Flags > LPT1 through print buffer

Configuration for Red Hat Linux ver 6.x using the KDE desktop

It is assumed that the tty device is defined in /etc/inittab
In the case of the following example the tty is defined as ttyS0 and the TERM environment variable is set to scoansi.
example:
S0:2345:respawn:/sbin/getty ttyS0 DT9600 scoansi

Login as root on the KDE desktop.
Simultaneously press Alt+F2
In the "Command window" type 'printtool', press 'Enter'.
Click on the *ADD* button.
Select Local Printer, Click on *OK*

Edit Local Print Entry
The printer name can be changed from the default name to any name say for example "invoice".
The Spool Directory can remain the default name or can be renamed. In this example the directory was named /var/spool/lpd/easitext.
The Printer Device will be set to /dev/ttyS0, as per example.
The Input Filter criteria must be selected to be compatible with the attached printer.

Once printtool has run, a printer interface
/var/spool/lpd/easitext/filter file is generated and the

/etc/printcap file is automatically modified. It is required that this printer interface file should be edited.

The editing required in the /var/spool/lpd/easitext/filter file is the addition of the through printing escape sequences using the printf statement. The start sequence is inserted at the very beginning of the file after the bash shell header and the comments. Remember to insert a space between the printf statement and the start of the argument quotation.

```
#!/bin/bash  
#  
# comments  
#
```

```
printf "\x1b\x5b\x35\x69" #direct data to the printer port
```

The end sequence is inserted at the end of the file immediately prior to the final exit 0 statement.

```
printf "\x1b\x5b\x34\x69" #redirect data to the console  
exit 0
```

Test the printer setup by printing a file using the following command.
lpr -P invoice /etc/testfile

NETWORK PRINTING - LPD

The Easitext is equipped with a Line Printer Daemon. The LPD can be attached to any of the terminal's three auxiliary hardware ports, parallel or serial.

UNIX Host Machine Criteria

Consideration should be given to the /etc/hosts file. The IP address of this Easitext terminal should appear in this file with an associated name for this "Remote Host".

Example:

192.168.100.10 NAME

Easitext Setup

Inside the setup menu select Comms > Sockets and the hardware port Comm1, Comm2 or LPT1 required. Toggle the spacebar to select the required function, in this case LPD.

Configuration for Red Hat Linux ver 6.x using the KDE desktop

Login to as root on the KDE desktop.

Simultaneously press Alt+F2

In the "Command window" type in 'printtool', press 'Enter'.

Click on the *ADD* button.

Select Remote unix (lpd) Queue, Click on *OK*

In the "Edit Remote unix (lpd) Queue" window configure the following:

Names: (enter the name of the printer to be set up e.g. invoice)

Spool directory: (leave as is).

File limit: (if set to 0 then no limit is set)

Remote host: enter the IP address of the Easitext terminal or the NAME of the Easitext terminal specified in /etc/hosts file.

Remote Queue: enter the LPD queue name or no entry required

Input filter: click on select, Choose the appropriate filter for the required printer.

Configuration for SCO Open Server ver 5.0x

Add an entry to the /etc/hosts file 192.168.0.11 NAME

Run "scoadmin printer" > "printers" > "add remote" > "Unix"

At Host enter the NAME that was added to the /etc/hosts file or the IP address of the terminal.

At Printer enter a name for the printer (this is the name that the spooler will be called e.g. slip1)

Remove the * from the "Use extended remote printer protocol" (this is only used between 2 SCO servers)

Then 'Enter' on 'OK'

It is always good to restart the print services, navigate to "system" "Print services" remove the * (asterisk) at remote print services. Then 'Enter' on 'OK' this has disabled the print services. Return to and insert the * (asterisk) for local and remote print services then 'Enter' on 'OK'.

LPD Remote Host status

The Easitext LPD responds to remote status requests such as lpq with the default print queue name of "EasiQ". This can be configured.

Setup > General > LPD Queue Name

lpq -P quename returns the following information:

Print Queue: EasiQ

TYPE: Parallel

STATE: Idle – Print buffer empty

TCP/IP SOCKET PRINTING (RAWPORT)

The appropriate serial or parallel physical hardware port(s) are assigned a TCP port number. The Host machine is equipped with Socket Printing "driver" utility software. The terminal continuously listens for a TCP connection at this port. This "driver" must establish a TCP socket connection with the Easitext Rawport transfer the print data then close the socket.

Easitext Setup

Ensure the terminal has an IP address and can connect with the application server.

In the terminal Setup menu navigate to Comms > Sockets. Highlight the hardware port the printer is connected to and press the space bar until it is set to RAWPORT [] Press enter on the highlighted port and enter the required port number. Press 'Enter' again and press 'F1' to save the configuration.

The Rawport inactivity watchdog timeout default is 60 seconds. This process manages broken TCP/IP connections. Timeout is configurable in Setup > General > Rawport Timeout Seconds.

If more than one printer is required a different TCP port number is required for each hardware port / printer.

Configuration for SCO UNIX

Copy the sockprn.sco file into the /usr/bin directory.
Type `chmod 755 /usr/bin/sockprn.sco` at the # prompt in order to make the file executable by all users.
Create a local printer in scoadmin, and in the device field use /dev/null
At the # prompt type `cd /var/spool/lp/admins/lp/interfaces` and press 'Enter'.
Type `vi <prntername>` where <prntername> is the name of the printer created in scoadmin.
Use the cursor keys to position the cursor on the first line of the file. Ensure Caps Lock is off, and press the 'o' key on the keyboard. This will insert a new line below the original cursor position.
Type '(' and press the 'Escape' key.

Press 'Shift-g' to go to the end of the file.
Press 'o' to add a line to the end of the file.
In this line, type the following:
`) | /usr/bin/sockprn.sco XXX.XXX.XXX.XXX YYY`
Where XXX.XXX.XXX.XXX is the IP Address of the Terminal and YYY is the port number configured on the terminal under Setup > Comms > Sockets.
Press the 'Escape' key.
Press 'Shift : ' and a colon should appear at the bottom of the screen.
Type 'wq!' and press 'Enter'

Note: If the setting for this printer is changed in Scoadmin this part may have to be re done.

Configuration for Linux (RedHat 6.2)

Copy the sockprn.linux file into the /usr/bin directory.
Type `chmod 755 /usr/bin/sockprn.linux` in order to make the file executable by all users.
Create a local printer in printtool, and in the device field use /dev/null
At the # prompt type `cd /var/spool/lpd/<prntername>` where <prntername> is the name of the created printer and press 'Enter'. Type 'vi filter' and use the cursor keys to position the cursor on the first line of the file. Ensure Caps Lock is off. Press the 'o' key on the keyboard. This will insert a new line below the original cursor position.
Type '(' and press the 'Escape' key.
Press 'Shift-g' to go to the end of the file.
Press 'o' to add a line to the end of the file, in this line, type the following: `) | /usr/bin/sockprn.linux XXX.XXX.XXX.XXX YYY`
Where XXX.XXX.XXX.XXX is the IP Address of the Terminal and YYY is the port number configured in Setup > Comms > Sockets.
Press the 'Escape' key.
Press 'Shift : ' and a colon should appear at the bottom of the screen.
Type 'wq!' and press 'Enter'.

Note: If the setting for this printer is changed in Printtool this part may have to be re done.

About sockprn.linux

There are two versions of this file, one is big (sockprn.linux) and the other is small (sockprn.linux.small).

The big one should run on any distribution of Linux.
The small one has only been tested with Redhat 6.1 and 6.2, but uses less disk space and memory to run.

It is possible to rename sockprn.linux.small to sockprn.linux.

Socketprn.XXXX Switches and usage

Two arguments are required, IP and port number.

Example:

sockprn.sco 192.23.13.14 338 will send everything received from STDIN to the terminal at IP address 192.23.13.14 on port 338. The port number argument is optional, if left out sockprn will default to port number 333.

The -r switch can be added to the command. This will set the utility to RAW mode and may help if problems are experienced when printing to non text printers.

Example:

sockprn.linux -r 192.44.77.88 20123 will send everything received from STDIN to the terminal at IP address 192.44.77.88 on port 20123 in RAW mode.

Using Netcat

Install netcat and set it into your system PATH (usually /usr/bin)

Create a device /dev/lpw1 - one for each printer. You may use any name eg. /dev/myprinter1. Use this command in the /dev directory: mknod -m 666 /dev/lpw1 p

Make sure your permissions are correct and set for the root user.

Create/Edit script file '/etc/profile.local' or '/etc/rc.d/rc.local' with the content: (see ***NOTE*** below)

```
#!/bin/sh
while true
do
  cat /dev/lpw1 | netcat -c 192.168.100.12 333
done
```

Here /dev/lpw1 is your printer device, the IP is that of the terminal and the port (333) is the port your socket daemon is listening on.

This script should be loaded when your server starts, and you would require one script for each printer.

NOTE

If you have a few printers the '/etc/profile.local' file might not be the best place for this script. You should rather consider using one of your startup scripts.

Look at '/etc/rc.d/rc.local'. This gets linked to run levels 2 through 5 (On Redhat 9), as '/etc/rcX.d/S99local' where X = 2,3,4,5

BARCODE SCANNER INTERFACE

The Easitext supports barcode scanning devices connected through the PS/2 keyboard interface and both RS-232 communication ports.

KEYBOARD WEDGE – PS/2

The keyboard interface is shared with the keyboard through a cable wedge. Power is supplied to the scanner through the keyboard interface connector. A maximum current of 500mA at +5Volts power is available for the scanner.

SERIAL PORT RS232 IMPLEMENTATION

The parameters of the chosen serial communications port must be configured to suit the barcode reader serial interface protocol.

Barcode data received by the serial port is re-directed to the host computer.

Setup > Comms > Comms 1(2 or 3) > Data Rx >> Tx

Power supply for the scanning device can be made available to the serial port D-Sub connectors through a jumper setting on the motherboard. Unregulated 7V or regulated +5V is available. A maximum current of 500mA current is available for the scanner.

TERMINAL SERVER

Available when a TCP/IP Ethernet network is the medium of communication with the host computer.

Slave serial terminals can connect to the network through the Easitext (Master) serial communication ports.

Setup > Comms > Sockets > Comms 1(or 2) > Server

The parameters of the chosen serial communications port must be configured to suit the slave terminal serial interface protocol.

Setup > Comms > Comms 1(or 2) > Handshake > Xon/Xoff

Setup > Flags > COM1(or 2) Tx Handshake > Xon/Xoff

Setup > Flags > COM1(or 2) Tx Buffering > FIFO ON

AUXILIARY SERIAL DEVICES

Data can be transmitted to and received from any device connected to the Easitext serial ports.

This functionality is available when a TCP/IP Ethernet network or RS232 Serial connection is the medium of communication with the host computer.

TCP/IP Socket implementation

Accomplished by writing to and reading from the specified TCP port. A specified serial physical hardware port is assigned a TCP port number.

Setup > Comms > Sockets > RAWPORT []

The Rawport inactivity watchdog timeout default is 60 seconds. This process manages broken TCP/IP connections. Timeout is configurable in Setup > General > Rawport Timeout Seconds.

Serial implementation

The mechanism for transmission is re-direction of the data received by the Easitext to the required serial port.

Data transmission to an auxiliary device can be accomplished by using a number of configuration topologies.

Terminal Control Escape Sequences can be used to re-direct incoming data out a specified serial communication port.

Through Print functionality where the “printer” port is a specified serial communication port and Printer Control Escape Sequences are used.

Data received from the auxiliary device by the serial port is re-directed to the host machine.

Setup > Comms > Comms 1(2 or 3) > Data Rx >> Tx

The parameters of the serial comms port must be compatible with the serial interface protocol of the auxiliary device.

Setup > Comms > Comms 1(or 2) > Handshake

Setup > Flags > COM1(or 2) Tx Handshake

Consideration must be given to size of the attached serial device receive buffer.

Setup > Flags > COM1(or 2) Tx Buffering

Serial devices with small receive buffers set to FIFO OFF.

4. CONFIGURATION

The Easitext provides an embedded setup program. The function of this program is for the user to configure the terminal operating parameters and program keyboard keys.

During the Power Up sequence the Easitext hardware is interrogated in order to determine the current hardware configuration. When detected that hardware undergoes an internal selftest.

Hardware is available if it is both present and has successfully completed the selftest. Available hardware is presented as an option in the setup program.

Configuration parameters and programmed key sequences are stored in non volatile flash memory.

To invoke the Easitext setup program the LEFT SHIFT and RIGHT SHIFT keys are pressed simultaneously.

USING THE SETUP PROGRAM

The setup program uses an intuitive point and pick user interface. Navigation through the setup option is by use of the keyboard arrow keys. In order to alter parameters the required pull-down menu must be activated. This is done by pressing the ENTER key.

Parameters are set by toggling options on or off and by incrementing or decrementing preset values.

Comms Menu

This menu option facilitates the configuration of the Serial communication ports and TCP/IP configuration if Ethernet communication is available.

Comms	Ports	Flags	Misc	General	Console	Emulate	Keys
Comms 1							
Comms 2							
Comms 3							
Network							
Hosts							
Sockets							
Ports							

Comms Parameters

Configuration data for each of the available serial communication ports is specified in these menus.

Baud Rate	9600
Data Length	8
Stop Bits	1
Parity	None
Handshake	Xon/Xoff
Comms	FDX
Data Rx >> Tx	OFF

Default Configuration

Comms	Parameter	Explanation
	Baud Rate	Rate at which serial data is transmitted and received is
	9600,19200, 38400, 57600, 76800, 115.2K, 50, 75, 110,134.5, 150, 300,600, 1200, 1800, 2000, 2400, 3600, 4800, 7200	baud

Data Length	Receive and transmit with
8	8-bit data
7	7-bit data
Stop Bits	Receive and transmit data with
1	1 stop bit
2	2 stop bits
Parity	Receive and transmit with
None	No parity
Odd	Odd parity
Even	Even parity
Mark	Mark parity
Space	Space parity
Handshake	Control the receipt of data with
Xon/Xoff	Xon/Xoff or XPC software handshaking
DTR/DSR	DTR hardware handshaking
DTR+Xoff	Both hardware and software handshaking
RTS/CTS	RTS hardware handshaking
None	No handshaking
Comms	Communication mode is
FDX	Full duplex
HDX	Half duplex
LOCAL	Internal loopback transmit to receive
BLOCK	Block
Data Rx >> Tx	Received data from this serial communications port is
OFF	Not transmitted out of the main port to the Host (Network or Serial)
ON	Transmitted out of the main port To the Host (Network or Serial)

TCP/IP Parameters

The terminal supports six console sessions, each console data are transferred through a dedicated TCP/IP socket, sockets may run concurrently. Connection can be made with six Remote IP addresses or for example all six console sessions/sockets may connect with one Remote IP. Hot keys Alt-F1 through Alt-F6 select session one to six.

The tty type is defaulted to the selected emulation. The tty type may be edited to suit certain termcap or terminfo file requirements.

The MAC address should only be altered if it is set to the default value.

Terminal IP	0.0.0.0
Remote 1 (Alt-F1) :	0.0.0.0
Remote 2 (Alt-F2) :	0.0.0.0
Remote 3 (Alt-F3) :	0.0.0.0
Remote 4 (Alt-F4) :	0.0.0.0
Remote 5 (Alt-F5) :	0.0.0.0
Remote 6 (Alt-F6) :	0.0.0.0
Subnet Mask	0.0.0.0
Gateway IP	0.0.0.0
tty type	ansi

Default Configuration

TCP/IP

Parameter	Explanation
Terminal IP	4 octet IP address of the terminal
Remote 1 (Alt-F1)	IP address of a Remote Host
Remote 2 (Alt-F2)	IP address of a Remote Host
Remote 3 (Alt-F3)	IP address of a Remote Host
Remote 4 (Alt-F4)	IP address of a Remote Host
Remote 5 (Alt-F5)	IP address of a Remote Host
Remote 6 (Alt-F6)	IP address of a Remote Host
Subnet Mask	Mask resolves data destination as subnet or gateway
Gateway IP	IP address of gateway for data not on this Subnet
tty type	TERM environment variable defaults to the current emulation and may be edited

Host Names

Each console session may be given a user defined name in order to aid with console session identification and selection. The default session names given are Session 1 through Session 6.

The session name is displayed on the screen of each non active session.

A Ctrl-Backspace key combination displays the session name pop-up window to facilitate session lookup and selection.

Remote 1 (Alt-F1) :	Session 1
Remote 2 (Alt-F2) :	Session 2
Remote 3 (Alt-F3) :	Session 3
Remote 4 (Alt-F4) :	Session 4
Remote 5 (Alt-F5) :	Session 5
Remote 6 (Alt-F6) :	Session 6

Default Configuration

Hosts

Parameter	Explanation
Remote 1 (Alt-F1)	Alternate description for display and lookup is
Session 1	Session 1
Remote 2 (Alt-F2)	Alternate description for display and lookup is
Session 2	Session 2
Remote 3 (Alt-F3)	Alternate description for display and lookup is
Session 3	Session 3
Remote 4 (Alt-F4)	Alternate description for display and lookup is
Session 4	Session 4
Remote 5 (Alt-F5)	Alternate description for display and lookup is
Session 5	Session 5
Remote 6 (Alt-F6)	Alternate description for display and lookup is
Session 6	Session 6

Socket Parameters

The terminal's serial and parallel ports can be assigned to a TCP/IP socket. Data sent to these sockets are transferred out of the assigned serial or parallel ports. Data received by these serial ports can be read from the assigned TCP/IP socket.

The Server option facilitates a serial connection to a slave terminal, thus enabling serial terminals to connect to the Host Computer through the LAN. With this option enabled the server terminal transmit handshake options must correspond with the handshake options in the slave terminal comms setup to both be Xon/Xoff.

Comms 1 :	Disabled
Comms 2 :	Disabled
LPT 1 :	Disabled

Default Configuration

Sockets

Parameter	Explanation
Comms 1	TCP/IP socket functionality assigned to this serial port is
Disabled	Disabled
Rawport [portno]	Transmit and receive LAN TCP/IP data through the user defined TCP/IP port number
LPD Server	Line Printer Deamon (port 515) Host to a slave serial terminal
Comms 2	TCP/IP socket functionality assigned to this serial port is
Disabled	Disabled
Rawport [portno]	Transmit and receive LAN TCP/IP data through the user defined TCP/IP port number
LPD Server	Line Printer Deamon (port 515) Host to a slave serial terminal
LPT 1	TCP/IP socket functionality assigned to this Centronics port is
Disabled	Disabled
Rawport [portno]	Transmit LAN TCP/IP data through the defined IP port number (socket printing)
LPD	Line Printer Deamon (port 515)

Telnet TCP Port Numbers

The conventional Telnet TCP port number is port 23 for UNIX operating systems. Some operating systems and applications listen on TCP port numbers other than port 23 for Telnet connections.

This option enables user configuration of the port number to be requested by the current session of the terminal when connecting to a remote host computer.

Telnet Remote 1 :	23
Telnet Remote 2 :	23
Telnet Remote 3 :	23
Telnet Remote 4 :	23
Telnet Remote 5 :	23
Telnet Remote 6 :	23

Default Configuration

Ports	Parameter	Explanation
		Specify alternate TCP/IP Telnet port number to the default of
	Telnet Remote 1	23 Specify alternate TCP/IP Telnet port number to the default of
	Telnet Remote 2	23 Specify alternate TCP/IP Telnet port number to the default of
	Telnet Remote 3	23 Specify alternate TCP/IP Telnet port number to the default of
	Telnet Remote 4	23 Specify alternate TCP/IP Telnet port number to the default of
	Telnet Remote 5	23 Specify alternate TCP/IP Telnet port number to the default of
	Telnet Remote 6	23

Ethernet

The terminal is equipped with a dual speed 10/100Mbps Ethernet capability. The default Ethernet configuration requires auto negotiation at boot time with a peer Ethernet device capable of auto negotiation. Failing which the terminal Network Interface Controller falls back to 10Mbps.

Two methods of establishing link integrity are provided, LinkDetect and AutoNegotiate, when both methods are selected AutoNegotiate takes precedence.

Text displayed in red is the current status of the Ethernet physical interface.

The MAC address should only be altered if it is reset to the default value.

Speed	10Mbps	STATUS
Duplex	HALF	STATUS
LinkDetect	ON	
AutoNegotiate	ON	
MAC Address	FF:FF:FF:FF:FF:FF	

Default Configuration

Ethernet	Parameter	Explanation
	Speed	The advertised speed of Ethernet operation is
	100Mbps	100Mbps (100Base-TX)
	10Mbps	10Mbps (10Base-T)
	Duplex	The advertised link duplex state is
	FULL	Full Duplex
	HALF	Half Duplex
	LinkDetect	LinkDetect link integrity is
	ON	Enabled
	OFF	Disabled
	AutoNegotiate	AutoNegotiate link integrity is
	ON	Enabled
	OFF	Disabled
	MAC address	Ethernet Media Access Control Address

Ports Menu

This menu facilitates the selection of the physical medium of communication with the host computer with the option of Serial or Network when Ethernet is available.

If Serial communication is the chosen medium then the Serial port required to communicate with the host computer can be specified.

The Serial or Parallel port assigned to handle traditional UNIX through printing and the printscreen function can be specified.

Comms	Ports	Flags	Misc	General	Console	Emulate	Keys
	Communication			NETWORK			
	Through Print			LPT 1			
Default Configuration							

If the multiscreen option is set to multihost in the General menu then additional Port menu options are displayed.

The multihost option enables two Serial host computer connections to the terminal. The terminal emulation for each host connection can be specified. Hotkey Alt-F11 and Alt-F12 toggle between the two connections.

Comms	Ports	Flags	Misc	General	Console	Emulate	Keys
	Communication			COM1			
	Through Print			LPT 1			
	Com1 M/Host Emul			Ansi (SCO)			
	Com2 M/Host Emul			VT-100			

Ports

Parameter	Explanation
Communication	The selected main communications port with the Remote Host is
NETWORK	TCP/IP
COM1	Serial Comm1
COM2	Serial Comm2
COM3	Serial Comm3 when equipped

Through Print	The port assigned to conduct pass through printing is
LPT1	Centronics LPT1
LPT2	Centronics LPT2 when equipped
COM1	Serial Comm1
COM2	Serial Comm2
COM3	Serial Comm3 when equipped
Comm1 M/Host EMUL	Emulation assigned to the serial multihost utility is
Ansi (SCO)	Selectable
Comm2 M/Host EMUL	Emulation assigned to the serial multihost utility is
Ansi (SCO)	Selectable

Flags Menu

This menu enables certain terminal configuration parameters to be selected and the configuration of certain terminal attributes.

Comms	Ports	Flags	Misc	General	Console	Emulate	Keys
		Printer			ON		
		Block Terminator			US/CR		
		Cursor Keys / Keypad			Normal/Numeric		
		COM1 Tx Handshake			OFF		
		COM2 Tx Handshake			OFF		
		COM1 Tx Buffering			FIFO ON		
		COM2 Tx Buffering			FIFO ON		
		Print Terminator – EOL/EOP			None/None		
		Disable Control-S Key			OFF		
		Monitor Line Output			OFF		
		LPT1 Through Print Buffer			OFF		
		Telnet Echo			ON		

Default Configuration

Flags

Parameter	Explanation
Printer	Through printing functionality is
ON	Selected on
OFF	Selected off
PrintSCR OFF	On and the PrintScreen key is disabled
Block Terminator	When a block of data is sent to the host the
US/CR	Line terminator is an ASCII US character, block terminator is an ASCII CR character
CRLF/ETX	Line terminators are ASCII CR and LF characters, block terminator is an ASCII ETX character
Cursor Keys	The cursor keys send
Normal Application	Cursor movement commands Application-specific control codes and escape sequences

Keypad	Numeric keypad keys send
Numeric Application	Characters on the keycaps Application-specific control codes and escape sequences
COM1/2 Tx Handshake	When transmitting data to a device connected to Comm1/2
OFF Xon/Xoff	Handshaking is ignored Respond to Xon/Xoff software handshaking
DTR/DSR	Respond to DTR/DSR hardware handshaking
COM1/2 Tx Buffering	When transmitting data to a device connected to Comm1/2 the
FIFO ON FIFO OFF	32 byte transmit FIFO is on FIFO is off
Print Terminator – EOL/EOP	The end of line character and the end of page form feed instruction is set to
None/None CR/None LF/None CR-LF/None None/FF CR/FF LF/FF CR-LF/FF	No end of line / No Form Feed Carriage Return / No Form Feed Line Feed / No Form Feed Carriage Ret & LF / No FF No end of line char / Form Feed Carriage Return / Form Feed Line Feed / Form Feed Carriage Ret + LF / FF on
Disable Control-S key	When serial communication is used the Ctrl-S (Xoff) key combination is
OFF ON	Disabled Enabled

Monitor Line	Data in its raw form (not parsed by emulator) for debug purposes is
OFF	Not displayed or printed
ASC	Displayed as ASCII when > 20 hex and otherwise displayed as symbols
HEX	Displayed as hexadecimal values inside brackets
HEX/ASC	Displayed as ASCII when > 20 hex and otherwise as hex in brackets
PRN ASC	Printed as ASCII when > 20 hex and otherwise as symbols
PRN HEX	Printed as hexadecimal values inside brackets
PRN HEX/ASC	Printed as ASCII when > 20 hex otherwise printed as hex in brackets
PRN ASC CR/LF	Printed as ASCII when > 20 hex and otherwise as symbols. CR & LF characters are interpreted
PRN HEX CR/LF	Printed as hexadecimal values inside brackets. CR & LF characters are interpreted
PRN HEX/ASC CR/LF	Printed as ASCII when > 20 hex otherwise printed as hex in brackets CR & LF characters are interpreted
PRN RAW	Sent directly to the printer port
LPT1 Through Print Buffer	Enhanced through printing, queues print jobs improving the availability of the Console and Keyboard
OFF	Disabled
ON	Enabled
Telnet Echo	The Telnet echo function is
ON	Enabled
OFF	Disabled
COM3 Handshake	When Comm3 is equipped and transmitting data to a device connected to Comm3
OFF	Incoming handshaking is ignored
Xon/Xoff	Respond to Xon/Xoff software handshaking

Misc Menu

A large amount of the configuration parameters required to execute the ASCII emulations are included in this menu option along with a few other terminal configuration parameters.

Comms	Ports	Flags	Misc	General	Console	Emulate	Keys
			WPRT Attrib		DIM		
			Attribute		LINE		
			Keyclick		OFF		
			Margin Bell		OFF		
			Enhance Mode		OFF		
			Autoscroll		ON		
			Automargins		ON		
			Status Line		OFF		
			Copy Print		OFF		
			Keyboard		Num Lock ON		
			Keyboard Scan		Code 2		

Default Configuration

Misc

	Parameter	Explanation
	WPRT Attrib	Write Protected character attributes are set to
ASCII only	DIM	Dim
	BLANK	Blank
	NORMAL	Normal
	REVERSE	Reverse
	UNDERLINE	Underline
	Attribute	Display attributes are
ASCII only	LINE	Active to the end of the line
	PAGE	Active to the end of the page
	CHAR	Assigned per character
	Keyclick	Audible click from the terminal's speaker with each keystroke is set
	OFF	Off
	ON	On

	Margin Bell	Sound the bell when the cursor reaches the defined column
ASCII only	OFF	Not enabled
	ON	Enabled
	Enhance Mode	Enabling of an enhanced set of codes is
Adds VP 2	OFF	Disabled
	ON	Enabled
	Autoscroll	When the cursor reaches the end of the page
	ON	The screen scrolls up one line
	OFF	It wraps to the top of the page
	Automargins	When the cursor moves past the last line
	ON	The data scrolls up one line
	OFF	The data does not scroll
	Status Line	A status line displaying terminal status messages is
ASCII only	OFF	Disabled
	ON	Enabled
	Copy Print	Echo of received characters for console display to the Through Print hardware port is
Ansi only	OFF	Disabled
	ON	Enabled
	Keyboard	At boot time the terminal
	Num Lock ON	Sets the keyboard Num Lock On
	Detect OFF	Does not initialise the keyboard
	Num Lock OFF	Does not set the Num Lock On
	Keyboard Scan	At boot time the keyboard interface
	Code 2	Uses the keyboard default scan code, code 2
	Code 1	Instructs the keyboard to run scan code 1

General Menu

This menu enables certain terminal configuration parameters to be selected and the configuration of certain terminal attributes.

Comms	Ports	Flags	Misc	General	Console	Emulate	Keys
				Silent Entry		OFF	
				Multiscreen		STD	
				Ctrl-Break Action		C-BRK	
				Printer Timeout Minutes		2	
				Customer Display		NO TRANS	
				POS Extensions		OFF	
				Change Password		RETAIN	
				Answerback String		DEFAULT	
				Organisation Name		DEFAULT	
				Screen Saver String		DEFAULT	
				LPD Queue Name		EasiQ	
				Rawport Timeout Seconds		60	

Default Configuration

General

Parameter	Explanation
Silent Entry	At boot time when serial comms is used the terminal bypasses the "Press any key to continue ..." page and enters a blank screen. When Network communications is used the "Press Left and R shift etc ..." string is removed. This function is
OFF	Disabled
ON	Enabled
Multiscreen	Serial communication multiscreen function is set as
STD	Standard MSCREEN operation
M/HOST	Multihost, the Hotkey between the 2 serial ports is Alt-F11 and Alt-F12
Ctrl-Break Action	When serial communication is used the Control Break key action is
C-BRK	A serial line break condition
C-BRK DTR	A line break and DTR handshake
NONE	Disabled

Printer Timeout Minutes	When the terminal is busy through printing and the printer does not respond warn and prompt the user
2,5,10,20,30,60,1 INFINITE	After these minutes have elapsed Is disabled
Customer Display	customised option
POS Extensions	customised option
Change Password	The default password "UNITERM" which enables access to the Setup menu is
RETAIN CHANGED	Retained Modified
Answerback String	The terminal Answer back string is
DEFAULT Answerback String	The default value User configurable
Organisation Name	When LAN communication is used the Organisation name displayed on the inactive console is
DEFAULT Organisation Name	"Press Left and Right Shift keys to run Setup"
Organisation Name	User configurable
Screen Saver String	If the screen saver is enabled the string displayed is
DEFAULT Screen Saver String	"Press a key to resume ..."
LPD Queue Name	The print Queue name replied to by an "lpstat" query is
EasiQ LPD Queue Name	"EasiQ" User configurable
RawPort Timeout Seconds	When a TCP/IP Rawport socket is in a connected state and there is inactivity for the defined period, flush the socket
15,30,45,60,75,90,120 OFF	After these seconds have elapsed The socket is not flushed

Console Menu

This menu option deals specifically with options pertaining to the terminal console configuration and setup.

Comms	Ports	Flags	Misc	General	Console	Emulate	Keys
					Columns	80	
					Monitor	Colour	
					Fore Colour OverRide	OFF	
					Back Colour OverRide	OFF	
					Cursor Shape	Underline	
					Cursor Colour	Lgrey	
					Screen Saver Minutes	10	
					Lines	24	
					Colourtrend Colour Mapping	OFF	
					Fast Screen Scrolling	OFF	
					Underline Substitute Fore	Default	
					Underline Substitute Back	Default	

Default Configuration

Console

Parameter	Explanation
Columns	The video text display is configured to
80	80 column width
132	132 column width
Monitor	Character attributes are optimised for a
Colour	Colour VGA monitor
Mono	Mono VGA monitor
Fore Colour	Character foreground colour attribute override is
OFF	Off
Black, Blue, Green, Cyan, Red, Purple, Brown, LGrey, Grey, LBlue, Lgreen, LCyan, LRed, LPurple, Yellow, White	Set to one of these colours

L is light

Back Colour	Character background colour attribute override is
OFF Black, Blue, Green, Cyan, Red, Purple, Brown, LGrey, Grey, LBlue, Lgreen, LCyan, LRed, LPurple, Yellow, White	Off Set to one of these colours
Cursor Shape	The cursor shape is
Underline OFF Block	An underscore Invisible A solid block
Cursor Colour	The cursor colour is
OFF Black, Blue, Green, Cyan, Red, Purple, Brown, LGrey, Grey, LBlue, Lgreen, LCyan, LRed, LPurple, Yellow, White	Set to default of Light Grey Set to one of these colours
Screen Saver Minutes	Inactivity on the terminal invokes screen saver action
10, 20, 30, 60, 1, 2, 5 OFF	After the selected amount of minutes has elapsed Disabled
Lines	The amount of display lines in the DEC VT emulations are
24 25	24 lines 25 lines
Colourtrend Colour Mapping	Colourtrend colour mapping
OFF ON	Disabled Enabled

Fast Screen Scrolling	Fast scrolling without vertical retrace synchronisation is
OFF ON	Disabled Enabled
Underline Substitute Fore	The VGA hardware is incapable of displaying an underlined character and substitutes underline for
Default Black, Blue, Green, Cyan, Red, Purple, Brown, LGrey, Grey, LBlue, Lgreen, LCyan, LRed, LPurple, Yellow, White	Inverse Video One of these colours
Underline Substitute Back	The VGA hardware is incapable of displaying an underlined character and substitutes underline for
Default Black, Blue, Green, Cyan, Red, Purple, Brown, LGrey	Inverse Video One of these colours

Emulate Menu

The required terminal emulator personality is selected from within this menu option.

Comms	Ports	Flags	Misc	General	Console	Emulate	Keys
					Ansi (SCO)	ON	
					VT-52	OFF	
					VT-100	OFF	
					VT220/320	OFF	
					Wyse-50/120	OFF	
					ADDS-VP A2	OFF	
					TVI-910/925	OFF	
					IMSTERM	OFF	
					PC-Term (Alloy)	OFF	

Default Configuration

Emulate	Parameter	Explanation
	Emulation	The terminal adopts the specified terminal emulator personality.
	ANSI (SCO)	8-bit ANSI Emulation
	VT-52	7-bit ANSI Emulation
	VT-100	7-bit ANSI Emulation
	VT-220/320	8-bit ANSI Emulation
	Wyse-50/120	7-bit ASCII Emulation
	ADDS-VP A2	7-bit ASCII Emulation
	TVI-910/925	7-bit ASCII Emulation
	IMSTERM	8-bit ASCII Emulation
	PC-Term(Alloy)	8-bit ASCII Emulation

Keys Menu

This menu facilitates the programming of up to 96 user programmable keys and key combinations.

Each emulation has a separate set of function keys.

A maximum character string of 50 characters per key is possible.

Comms	Ports	Flags	Misc	General	Console	Emulate	Keys
	F1	•[M					
	F2	•[N					
	F3	•[O					
	F4	•[P					
	F5	•[Q					
	F6	•[R					
	F7	•[S					
	F8	•[T					
	F9	•[U					
	F10	•[V					
	F11	•[W					
	F12	•[X					

Programming the Keys

Before a set of keys is programmed the required emulation must be selected.

Navigation between groups of programmable keys is carried out by pressing the Page Up or Page Down key.

To select an individual key within the selected group of programmable keys the up and down arrow keys are used. The key is *highlighted* when selected.

Comms	Ports	Flags	Misc	General	Console	Emulate	Keys
	F1		•[M				
HEX	1b	5b	4e				
DEC	27	91	78				
CTL	ESC	[N				
POS	0	1	2				
	F11		•[W				
	F12		•[X				

Once the required key is selected, the ENTER key must be pressed. This action pops up a key programming window. The current setting of the key is displayed in various formats. The left and right arrow keys may be used to select any character in the key character string.

In the key programming mode, overwrite is the only edit mode available. Any keystrokes not required may be erased by pressing the Del key. New key string characters are programmed by pressing the required keystrokes.

Control sequences may be entered by simultaneously holding down the control key and typing the desired key which constitutes the control sequence.

To enter key string characters which are out of the normal typewriter key range or to enter the decimal value of the required character, the 'Alt' key must be held in the depressed state, and the decimal ASCII value of the character required entered on the numeric keypad. On release of the 'Alt' key, the value is displayed.

Once an individual key is programmed, the 'End' key is used to close the programming window. Further keys may then be programmed.

5. ANSI EMULATIONS

The following tables list the functionality of the ANSI, VT100 and * VT220/320 terminal emulations.

Mnemonics beginning with DEC are Digital Equipment Corporation private mnemonics. All others mnemonics are ANSI mnemonics.

A Control Sequence Introducer (CSI) is an escape sequence that provides supplementary control of the terminal.

An escape sequence is a prefix to a limited number of continuous characters affecting the interpretation of these characters.

7 bit CSI is **ESC [**

8 bit CSI is **9B** (hexadecimal)

A control sequence with more than one selective parameter causes the same effect as several control sequences, each with one selective parameter e.g. CSI Psa;Psb;Psc F is identical to CSI Psa F CSI Psb F CSI Psc F. A parameter string is a string of characters separated by a semicolon. Pn denotes such a parameter string.

7 bit format example:

The Erase Display command can be invoked with the quoted escape sequence;
 "ESC [n J"
 "1b 5b n 4a" are the hexadecimal encoded character values for this sequence where n is a user defined variable.

8 bit format example:

The Erase Display command can be invoked with the quoted escape sequence;
 "CSI n J"
 "9b n 4a" are the hexadecimal encoded character values for this sequence where n is a user defined variable.

* Prism 9 emulation is available on request

Controlling Terminal Modes	Sequence	Mnemonic
Local echo enable	CSI 12 h	SRM
Local echo disable	CSI 12 l	SRM
Save cursor position, attributes, character sets	ESC 7 CSI s	DECSC
Restore cursor position, attributes, character sets	ESC 8 CSI u	DECRC
Sound Bell	CTRL G	BEL
PC Term data compatibility on	CSI = 11 K	
PC Term data compatibility off	CSI = 10 K	
LPT1 is printer port.	CSI 6 i	
LPT2 is printer port.	CSI 7 i	
COMM1 is printer port.	CSI 8 i	
COMM2 is printer port .	CSI 9 i	
COMM3 is printer port.	CSI 10 i	
COMM1 is main port to host.	CSI 12 i	
COMM2 is main port to host.	CSI 13 i	
COMM3 is main port to host.	CSI 14 i	
Cash drawer opening pulse	CSI 1 t	
Redirect all received characters to COMM1	CSI 4 t	
Redirect all received characters to COMM2	CSI 5 t	
Undo CSI 4 t or CSI 5 t	CSI 6 t	
Save terminal setup to FLASH.	CSI 9 t	
Display screen adjustment pattern 'E'	ESC # E	DECALN

Assigning Character Sets	Sequence	Mnemonic
Assign G0 character set to GL	CTRL O	LS0
Assign G1 character set to GL	CTRL N	LS1
Assign G2 character set to GL	ESC n	LS2
Assign G3 character set to GL	ESC o	LS3
Assign G2 character set to GL for the next character only	ESC N	SS2
Assign G3 character set to GL for the next character only	ESC 0	SS3
Designate to G0 with final byte F	ESC (F	
Designate to G1 with final byte F	ESC) F	
Designate to G2 with final byte F	ESC * F	
Designate to G3 with final byte F	ESC + F	
Designate to G1 with final byte F	ESC - F	
Designate to G2 with final byte F	ESC . F	
Designate to G3 with final byte F	ESC / F	

Selecting Terminal Personalities	Sequence	Mnemonic
VT52	CSI ? 2 l	DECANM
VT100	CSI 61;” p	DECSCSCL
VT220 7-bit	CSI 62;1” p	DECSCSCL
VT220 8-bit	CSI 62;2” p	DECSCSCL

Controlling Cursor Movement	Sequence	Mnemonic
Move the cursor to column n	CSI n `	HPA
	CSI n G	CHA
Move cursor up n lines	CSI n A	CUU
Move cursor up n lines	CSI n k	VPB
Move cursor down n lines	CSI n e	VPR
	CSI n B	CUD
Move cursor right n columns	CSI n C	CUF
	CSI n a	HPR
Move cursor left n columns	CSI n D	CUB
Move cursor left n columns	CSI n j	HPB
Move cursor to line n	CSI n d	VPA
Move cursor to line m, column n	CSI m;n H	CUP
	CSI m;n f	HVP
Move cursor down one line in current column, if at bottom line and Autoscroll ON scroll up one line	CTRL J	LF
Move cursor top line left most column clear display	CTRL L	FF
Move cursor down n lines and to column 1	CSI n E	CNL
Move cursor down 1 line and to column 1	ESC E	NEL
Move cursor down 1 line without changing column position	ESC D	IND
Move cursor up n lines and to column 1	CSI n F	CPL
Move cursor up 1 line without changing column position	ESC M	REVIND
Backspace cursor	CTRL H	BS
Move cursor to next tab stop	CTRL I	HT
Scroll up n lines, introducing blank lines at screen bottom	CSI n S	SU
Scroll down n lines, introducing blank lines at screen top	CSI n T	SD

Editing Functions	Sequence	Mnemonic
Insert mode on	CSI 4 h CSI ? 4 h	IRM
Insert mode off	CSI 4 l CSI ? 4 h	IRM
Erase from cursor to end of display	CSI 0 J	ED
Erase from start of display to cursor	CSI 1 J	ED
Erase entire display	CSI 2 J	ED
Erase from cursor to end of line	CSI 0 K	EL
Erase from start of line to cursor	CSI 1 K	EL
Erase entire line	CSI 2 K	EL
Erases n characters beginning at cursor	CSI n X	ECH
Insert n blank characters beginning at cursor	CSI n @	ICH
Insert n blank lines beginning at cursor line	CSI n L	IL
Deletes n lines beginning at cursor line	CSI n M	DL
Deletes n characters beginning at cursor	CSI n P	DCH
Clear tab stop at cursor	CSI g CSI 2 W	TBC CTC
Clear all tab stops	CSI 3 g CSI 5 W	TBC CTC
Set tab stop at cursor	CSI W ESC H	CTC HTS
Set absolute horizontal tabs	CSI Pn N	HTSA
Move forward n tab stops	CSI n l	CHT
Move backward n tab stops	CSI n Z	CBT
Move cursor to next tab stop	CTRL I	HT

Controlling the Keyboard	Sequence	Mnemonic
Keyboard lock on	CSI 2 h	KAM
Unlock keyboard	CSI 2 l	KAM
Numeric keypad numeric mode on	ESC > CSI ? 66 l	KPNM
Numeric keypad application mode on	ESC = CSI ? 66 h	KPNM
Cursor keys send application dependent codes	CSI ? 1 h	DECCKM
Cursor keys send cursor movement codes	CSI ? 1 l	DECCKM
Define Backspace key as 7F hex	CSI ? 67 l	DECBKM
Undo Backspace key definition	CSI ? 67 h	DECBKM
Convert keyboard lowercase to uppercase	CSI ? 99 h	
Disable uppercase conversion	CSI ? 99 l	
Define function key number n with a character string. n is defined as the key number starting at zero plus the ASCII value of zero. For example, F1 = 0 ... F12 = <. String delimiters may be any character not included in the string. In order to include characters of value less than 20 hexadecimal in key string the ^ character is used. The ^ character will cause the next character to have 20 hexadecimal subtracted from its ASCII value thus ^! results in 01 hexadecimal. The ^ character is not included in the string. Example: set F1 to contain the string ABCDE. The character % can be used as a delimiter as it is not part of the string . The following sequence is sent to the terminal: ESC Q 0 % ABCDE % The string attached to F1 is now ABCDE. The string is modified but not saved to non-volatile memory. CSI 9 t saves configuration to Flash.	ESC Q n delimiter string delimiter	

Controlling the Screen Display	Sequence	Mnemonic
132 column display	CSI ? 3 h	DECCOLM
80 column display	CSI ? 3 l	DECCOLM
	CSI ? 98 l	
Autowrap on	CSI ? 7 h	DECAWM
Autowrap off	CSI ? 7 l	DECAWM
Cursor displayed	CSI ? 25 h	DECTCEM
Cursor invisible	CSI ? 25 l	DECTCEM
Character flash attribute enable	CSI = 1 E	
Character flash attribute disable	CSI = 0 E	
Cursor invisible when m > n	CSI = m;n C	
Cursor normal	CSI = 11;12 C	
Cursor solid	CSI = 1;14 C	
Display ASCII character n	CSI n g	
Switch active screen to n. If screen n does not exist no action will take place. (multiscreen)	CSI n z	
Set screen regions top;bottom	CSI n;m r	SREG

Transmission/Printer Control	Sequence	Mnemonic
Send form feed after print page operation on	CSI ? 18 h	DECPFF
Send form feed off	CSI ? 18 l	DECPFF
Print full screen	CSI ? 19 h	DECPEX
Print scrolling region	CSI ? 19 l	DECPEX
Print line	CSI ? 1 i	MC
Transparent print mode on	CSI ? 5 i	MC
Transparent print mode off	CSI ? 4 i	MC
Suspend serial transmission Xoff	CTRL S	DC3
Resume serial transmission Xon	CTRL Q	DC1
Send answerback string	CTRL E	ENQ
	CSI c	DA
	CSI 7 t	
Print screen	CSI t	MC
Transparent print mode off	CSI 4 i	MC
Transparent print mode on	CSI 5 i	MC

Terminal Reports	Sequence	Mnemonic
Request primary device attributes	CSI c ESC Z	DA
Request terminal status	CSI 5 n	DSR
Request cursor position	CSI 6 n	DSR

Controlling Attributes	Sequence	Mnemonic
Set foreground colour to n	CSI = n F	
Set background colour to n	CSI = n G	
Attribute selection translation	CSI Pn w	PSAT
Select character attributes as per chart.	CSI Pn m	SGR

n	Colour
0	Black
1	Blue
2	Green
3	Cyan
4	Red
5	Magenta
6	Brown
7	White
8	Grey
9	Lt. Blue
10	Lt. Green
11	Lt. Cyan
12	Lt. Red
13	Lt. Magenta
14	Yellow
15	Lt. White

Colour Table

Pn	Video Function	Region
0	All attributes off (normal display)	
1	Bold Intensity	
5	Blink On	
7	Reverse Video	
8	Invisible On (Non Display)	
10	Primary Font	
11	First Alternate Font: Allows ASCII screen characters in video ROM below 20H to be displayed	
12	Selects a 2nd alternate font: Allows extended ASCII screen characters in video ROM to be displayed	
22	Normal Intensity	
25	Blink Off	
27	Reverse Video Off	
28	Invisible Off	
30	Black	Foreground
31	Red	Foreground
32	Green	Foreground
33	Brown	Foreground
34	Blue	Foreground
35	Magenta	Foreground
36	Cyan	Foreground
37	White	Foreground
40	Black	Background
41	Red	Background
42	Green	Background
43	Brown	Background
44	Blue	Background
45	Magenta	Background
46	Cyan	Background
47	White	Background

Select Graphic Rendition (SGR) Chart

ANSI Emulation Programmable Keys

All non alpha-numeric keys are programmable either via the Easitext configuration menus or via application software. The default setup of the ANSI Emulation programmable keys are listed in the tables that follow.

The number in the **Num** column of these tables corresponds to the *key* number referred to in the last table of ANSI escape sequences which describes the *ESC Q Fn 'string'* sequence.

Num	Key	ANSI	VT220	VT100
0	F1	CSI M	CSI 17 ~	Å P
1	F2	CSI N	CSI 18 ~	Å Q
2	F3	CSI O	CSI 19 ~	Å R
3	F4	CSI P	CSI 20 ~	Å S
4	F5	CSI Q	CSI 21 ~	CSI M
5	F6	CSI R	CSI 23 ~	CSI 17 ~
6	F7	CSI S	CSI 24 ~	CSI 18 ~
7	F8	CSI T	CSI 25 ~	CSI 19 ~
8	F9	CSI U	CSI 26 ~	CSI 20 ~
9	F10	CSI V	CSI 28 ~	CSI 21 ~
10	F11	CSI W	Å P	CSI 23 ~
11	F12	CSI X	Å Q	CSI 24 ~
12	Shift-F1	CSI Y	Å P	Å P
13	Shift-F2	CSI Z	Å Q	Å Q
14	Shift-F3	CSI a	Å R	Å R
15	Shift-F4	CSI b	Å S	Å S
16	Shift-F5	CSI c	CSI 31 ~	CSI K
17	Shift-F6	CSI d	CSI 32 ~	CSI 31 ~
18	Shift-F7	CSI e	CSI 33 ~	CSI 32 ~
19	Shift-F8	CSI f	CSI 34 ~	CSI 33 ~
20	Shift-F9	CSI g	CSI 35 ~	CSI 34 ~
21	Shift-F10	CSI h	CSI 1 ~	CSI 35 ~
22	Shift-F11	CSI i	CSI 2 ~	CSI 1 ~
23	Shift-F12	CSI j	CSI 26 ~	CSI 2 ~
24	home	CSI H	CSI H	CSI H
25	up	CSI A	CSI A	CSI A
26	Pg Up	CSI I	CSI V	CSI V
27	Num-	CSI W CSI A	-	-
28	Left	CSI D	CSI D	CSI D
29	Num 5	CSI E	5	5
30	Right	CSI C	CSI C	CSI C
31	Num +	CSI W CSI B	+	+

32	End	CSI F	^j	^j
33	Down	CSI B	CSI B	CSI B
34	Pg Dn	CSI G	CSI U	CSI U
35	Ins	CSI L	CSI @	CSI @
36	Del	0x7f	0x7f	0x7f
37	Ctl-Del	0x7f	0x7f	0x7f
38	Alt-Del	0x7f	0x7f	0x7f
39	Shift-Tab	CSI Z	CSI Z	CSI Z
40	Ctl-Tab	CSI W CSI Z	CSI Z	CSI Z
41	Ctl-Enter	CSI W ^j	^m	^m
42	Escape	ESC	ESC	ESC
43	Backspace	^h	^h	^h
44	Alt-Leadin	CSI X	^m	^m
45	Enter	^m	^m	^m
46 - 47	Unused			
48	Ctl-F1	CSI k		
49	Ctl-F2	CSI l		
50	Ctl-F3	CSI m		
51	Ctl-F4	CSI n		
52	Ctl-F5	CSI o		
53	Ctl-F6	CSI p		
54	Ctl-F7	CSI q		
55	Ctl-F8	CSI r		
56	Ctl-F9	CSI s		
57	Ctl-F10	CSI t		
58	Ctl-F11	CSI u		
59	Ctl-F12	CSI v		
60	SC-F1	CSI w		
61	SC-F2	CSI x		
62	SC-F3	CSI y		
63	SC-F4	CSI z		
64	SC-F5	CSI @		
65	SC-F6	CSI [
66	SC-F7	CSI \		
67	SC-F8	CSI]		
68	SC-F9	CSI ^		
69	SC-F10	CSI _		
70	SC-F11	CSI `		
71	SC-F12	CSI {		
72	Alt-F1	CSI = A	Å P	Å P
73	Alt-F2	CSI = B	Å Q	Å Q
74	Alt-F3	CSI = C	Å R	Å R
75	Alt-F4	CSI = D	Å S	Å S
76	Alt-F5	CSI = E	CSI M	CSI M
77	Alt-F6	CSI = F	CSI 1 7 ~	CSI 1 7 ~
78	Alt-F7	CSI = G	CSI 1 8 ~	CSI 1 8 ~

79	Alt-F8	CSI = H	CSI 1 9 ~	CSI 1 9 ~
80	Alt-F9	CSI = I	CSI 2 0 ~	CSI 2 0 ~
81	Alt-F10	CSI = J	CSI 2 1 ~	CSI 2 1 ~
82	Alt-F11	CSI = K	CSI 2 3 ~	CSI 2 3 ~
83	Alt-F12	CSI = L	CSI 2 4 ~	CSI 2 4 ~
84	C-Home	CSI W CSI H		
85	C-Up	CSI W CSI A		
86	C-Pg Up	CSI W CSI I		
87	C-Num -	-		
88	C-Left	CSI W CSI D		
89	C-Num 5	CSI W CSI E		
90	C-right	CSI W CSI C		
91	C-Num +	+		
92	C-End	CSI W CSI F		
93	C-Down	CSI W CSI B		
94	C-Pg Dn	CSI W CSI G		
95	C-Ins	CSI W CSI L		

6. VT52 EMULATION

Cursor Movement Commands	Sequence	Mnemonic
Direct cursor address	ESC Y row col	CUP
Move the cursor position up one line	ESC A	CUU
Move the cursor position down one line	ESC B	CUD
Move the cursor one position forward	ESC C	CUF
Move the cursor one position backward	ESC D	CUB
Move the cursor to the first line and column	ESC H	CUH
Move the cursor up one line if the active position is at screen top then scroll down	ESC I	
Character Set Selection	Sequence	Mnemonic
ASCII Character Set	ESC G	
Line graphics Character Set	ESC F	
Editing Commands	Sequence	Mnemonic
Erase to end of screen	ESC J	
Erase to end of line	ESC K	
Terminal Control	Sequence	Mnemonic
Switch to VT100 emulation	ESC <	
Transmit identifier escape sequence	ESC Z ESC /	
Auxiliary Port Control	Sequence	Mnemonic
Enter Auto print mode where display data is also printed	ESC ^	
Exit Auto print mode	ESC _	
Enter transparent print mode	ESC W	
Exit transparent print mode	ESC X	
Print current display screen	ESC]	
Print current line	ESC V	

VT-52 Programmable Keys

Num	Key	Sequence
5	F6	ESC
6	F7	^m
7	F8	^r
24	Home	ESC H
25	Up	ESC A
27	Num -	-
28	Left	ESC D
30	Right	ESC C
31	Num +	+
33	Down	ESC B
36	Del	DEL
37	Ctl-Del	DEL
38	Alt-Del	DEL
41	Ctl-Enter	^o
42	Escape	ESC
43	Backspace	^m

7. ASCII COMMANDS

The Wyse 120 emulation operates according to the American Standard Code for Information Interchange (ASCII) command functions.

Other available ASCII emulations are the Wyse 50, ADDS Viewpoint A2, TeleVideo 910 and 910+, Televideo 925 and PCTERM/IMSTERM emulations for use with applications written for IBM PC compatible terminals.

Selecting terminal Personalities	Sequence
Enhance mode on	ESC ~ !
Enhance mode off	ESC ~ SP
Select VT220-7 personality	ESC ~ <
Select VT220-8 Personality	ESC ~ =

Terminal Controls	Sequence
Sound the terminal bell	CTRL G
Send ACK	CTRL E
Full-duplex mode on	ESC C ESC D F
Half-duplex mode on	ESC C ESC D H
Block mode on	ESC B
Half duplex block mode on	ESC D H ESC B
Send terminal ID	ESC SP
Monitor mode on	ESC U
Monitor mode off	ESC u ESC X

Host Communications	Sequence
Block mode on	ESC B
Block mode off, conversation on	ESC C
Stop transmission	CTRL Q
Resume transmission	CTRL S
Local edit mode on	ESC k
Local edit mode off	ESC I

Keyboard Controls	Sequence
Keyboard lock on	ESC # CTRL O
Keyboard lock off	ESC “ CTRL N
Keyclick on	ESC e %
Keyclick off	ESC e \$
Set margin bell on	ESC e M
Set margin bell off	ESC e L
Set margin bell at cursor position	ESC ` J
Program and display function key definition	ESC z field label DEL
Clear function key definition	ESC z field DEL

Display Message fields	Sequence
Status line on	ESC ` a
Status line off	ESC ` b
Program and display message on shifted label line	ESC ` c
Program and display message on unshifted label line	ESC z) text CR
Clear shifted label line	ESC z (text CR
Clear unshifted label line	ESC z) CR
Program and display message on status line	ESC z (CR
	ESC F msg CR
Defining the Data Area	Sequence
Select 80 column display	ESC ` :
Select 132 column display	ESC ` ;
Display size 24 lines	ESC e (
Display size 25 lines	ESC e)
80/132 column width change clear off	ESC e .
80/132 column width change clear on	ESC e /
Cursor Control	Sequence
Cursor off	ESC ` 0
Display underscore Cursor	ESC ` 1
	ESC ` 3
	ESC ` 4
Display block Cursor	ESC ` 2
	ESC ` 5
Backspace, cursor left	CTRL H
Move cursor to next tab stop	CTRL I
Linefeed, cursor down	CTRL J
Cursor up	CTRL K
Cursor right	CTRL L
Carriage return	CTRL M
Cursor down, no scroll or wrap.	CTRL V
Cursor home.	CTRL ^
	ESC {
Move cursor to start of next line.	CTRL _
Move cursor to line, column (80 col)	ESC = l c
Move cursor to line	ESC [I
Move cursor to line column (80/132 col)	ESC a III R ccc C

Screen Memory and Screen Pages	Sequence
Switch screen page (page=0 to page=5)	ESC w page
Display previous page	ESC w B
Display previous page or if screen is split swop to other page	ESC J
Display next page	ESC w C
Display next page or if screen is split swop to other page	ESC K
Horizontal screen split into pages	ESC x A line
Horizontal screen split into pages and clear screen	ESC x 1 line
Lower horizontal split	ESC x P
Raise horizontal split	ESC x R
Roll page window up	ESC w E
Roll page window down	ESC w F
Redefine screen as one window	ESX x @
Redefine screen as one window and clear pages	ESX x 0
Activate upper page	ESC]
Activate lower page	ESC }
Editing Functions	Sequence
Clear all tab stops	ESC 0
Set tab stop	ESC 1
Clear tab stop	ESC 2
Tabulate cursor	ESC i
Back tab	ESC I
Insert mode on	ESC q
Insert mode off	ESC r
Insert space characters	ESC Q
Insert blank line	ESC E
Delete cursor character	ESC W
Delete cursor line	ESC R

Clear Screen Display	Sequence
Clear page	ESC *
Clear screen to write protected spaces	ESC + ESC , ESC ;
Clear unprotected pages	ESC : CTRL Z
Clear unprotected page to a specific character	ESC . char
Clear unprotected pages to display attribute	ESC ! attr
Clear unprotected line to End of Page	ESC Y ESC y
Clear unprotected line to End of Line	ESC T ESC t

Transmission to Host	Sequence
Send cursor character	ESC M
Send unprotected line until cursor	ESC 4
Send unprotected page until cursor	ESC 5
Send line until cursor	ESC 6
Send page until cursor	ESC 7
Mark the beginning of block	ESC 8
Mark the end of block	ESC 9
Send entire block	ESC s
Send unprotected characters in block	ESC S

Printer Control	Sequence
Print Screen	ESC @ ESC L ESC P ESC p
Auxiliary print mode off	CTRL T
Auxiliary print mode on	CTRL R
Transparent print mode on	ESC d #
Transparent print mode off	CTRL T
Send next incoming character to printer	CTRL P

Display Attributes and Data Protection	Sequence
Assign display attribute to a message field	ESC A mf attr
Assign character display attribute	ESC G attr
Assign write protected character display attribute	ESC ` wpattr
Write protect mode on	ESC)
Write protect mode off	ESC (
Clear cursor column to write protect spaces	ESC V
Protect mode on	ESC &
Protect mode off	ESC '
Line drawing graphics mode on	ESC H CTRL B
Line drawing graphics mode off	ESC H CTRL C
Display line drawing graphics character	ESC H l d g char

attr	Blank	Blink	Reverse	Underline	Dim
0					
1	✓				
2		✓			
3	✓	✓			
4			✓		
5	✓		✓		
6		✓	✓		
7	✓	✓	✓		
8				✓	
9	✓			✓	
:		✓		✓	
;	✓	✓		✓	
<			✓	✓	
=	✓		✓	✓	
>		✓	✓	✓	
?	✓	✓	✓	✓	
p					✓
q	✓				✓
r		✓			✓
s	✓	✓			✓
t			✓		✓
u	✓		✓		✓
v		✓	✓		✓
w	✓	✓	✓		✓
x				✓	✓
y	✓			✓	✓
z		✓		✓	✓
{	✓	✓		✓	✓
			✓	✓	✓
}	✓		✓	✓	✓
~		✓	✓	✓	✓
DEL	✓	✓	✓	✓	✓

VARIABLE VALUES FOR ASCII COMMANDS

PROGRAMMABLE KEYS

The default setup of the ASCII programmable keys are listed in the tables that follow. These keys are programmable with the embedded Easitext Setup program and the application software.

The **Num** column of these tables corresponds to Q in the *ESC Q Fn 'string'* sequence.

Num	Key	Wyse50/120 TV910/925	ADDS VP
0	F1	SOH @ CR	STX @ CR
1	F2	SOH A CR	STX A CR
2	F3	SOH B CR	STX B CR
3	F4	SOH C CR	STX C CR
4	F5	SOH D CR	STX D CR
5	F6	SOH E CR	STX E CR
6	F7	SOH F CR	STX F CR
7	F8	SOH G CR	STX G CR
8	F9	SOH H CR	STX H CR
9	F10	SOH I CR	STX I CR
10	F11	SOH J CR	STX J CR
11	F12	SOH K CR	STX K CR
12	SHIFT-F1	ESC ' CR	STX P CR
13	SHIFT-F2	ESC a CR	STX Q CR
14	SHIFT-F3	ESC b CR	STX R CR
15	SHIFT-F4	ESC c CR	STX S CR
16	SHIFT-F5	ESC d CR	STX T CR
17	SHIFT-F6	ESC e CR	STX U CR
18	SHIFT-F7	ESC f CR	STX V CR
19	SHIFT-F8	ESC g CR	STX W CR
20	SHIFT-F9	ESC h CR	STX X CR
21	SHIFT-F10	ESC i CR	STX Y CR
22	SHIFT-F11	ESC j CR	STX Z CR
23	SHIFT-F12	ESC k CR	STX [CR
24	HOME	RS	SOH
25	UP ARR	VT	SUB
26	PG UP		DLE
27	-	-	-
28	L ARR	BS	NAK
29	N 5		
30	R ARR	FF	ACK
31	+	+	+
32	END		
33	DN ARR	LF	LF

34	PG DN		LF
35	INS		
36	DEL	DEL	DEL
37	CTRL-DEL	DEL	DEL
38	ALT-DEL	DEL	DEL
39	SHIFT-TAB		
40	CTRL-TAB		
41	CTRL-ENTER	LF	LF
42	Escape	ESC	ESC
43	Backspace	BS	BS
44	Alt Leadin		
45	Return	CR	CR
46-97	UNUSED		