



CipherLab Terminal Emulation

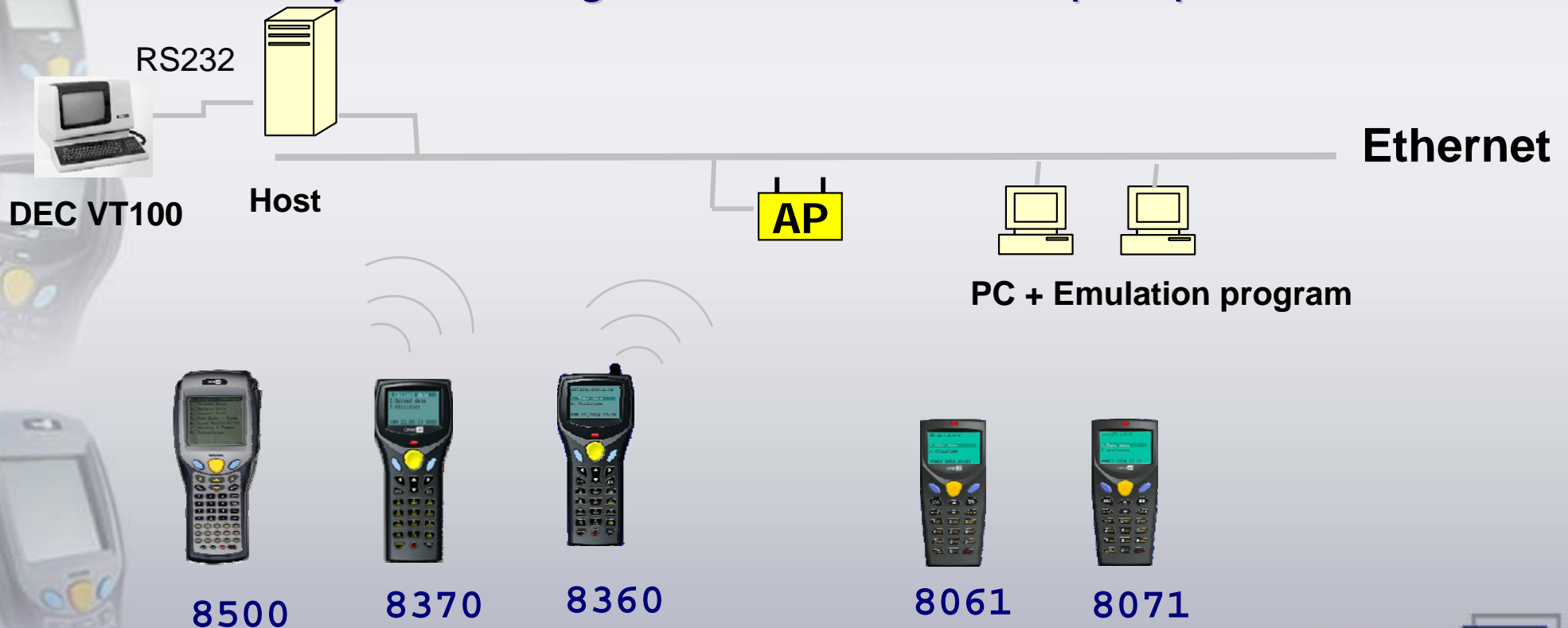
Supporting team
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What is Terminal Emulation?

- Terminal Emulation a software application that allows you to connect to a Telnet capable host system to access data or applications via TCP/IP protocol.
- Telnet is a TCP service that allows remote terminals to attach to a host system using TCP/IP as the transport protocol.



Network Architecture

- Network OSI Architecture
- TCP/IP Architecture

Application Layer	Application Layer (Telnet , FTP , DNS , SMTP)
Presentation Layer	
Session Layer	
Transmit Layer	Transmit Layer (TCP , UDP , ARP/RARP)
Network Layer	Network Layer (IP , ICMP)
Data Link Layer	Physical Layer (Ethernet , Token Ring)
Physical Layer	

How does Terminal Emulation work?

■ TELNET major Negotiations

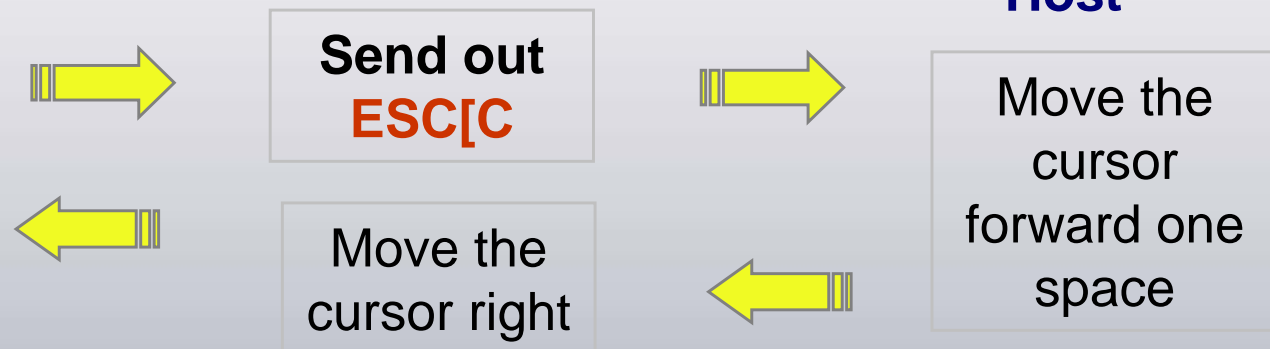
- Check the Host IP and Port number
- Check whether there's any available client port
- Echo (ON or OFF)
- Device Name (only for TN5250)
- Terminal Type (VT100,VT220, or TN5250)
- Send the login screen



How does Terminal Emulation work?

■ Application

- When you press a key, the terminal sends a signal (a key code or key sequence) to the host.
- The host processes that signal and sends a signal in response.
- This response is often the display on the terminal screen of a character or the output of a process.



VT Series sample

Emulation Protocols

■ Supported emulation protocols

- VT100
- VT220
- TN5250

■ Terminals that support emulations

- 8370/8360
- 8061/8071
- 8570

Necessary Files

■ VT100, VT220

- 83xxVT-250.SHX/ 8060VT-250.SHX/ 85xxVT-250.SHX
- CipherNet-VT.EXE
- CipherNet-VT User Guide.doc

■ TN5250

- 83xxIBM-233.SHX/ 8060-I233.SHX/ 85xxIBM-233.SHX
- CipherNet-IBM.EXE
- CipherNet-5250 User Guide.doc

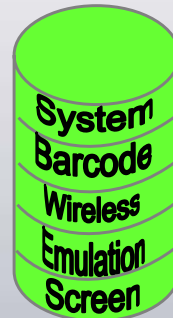
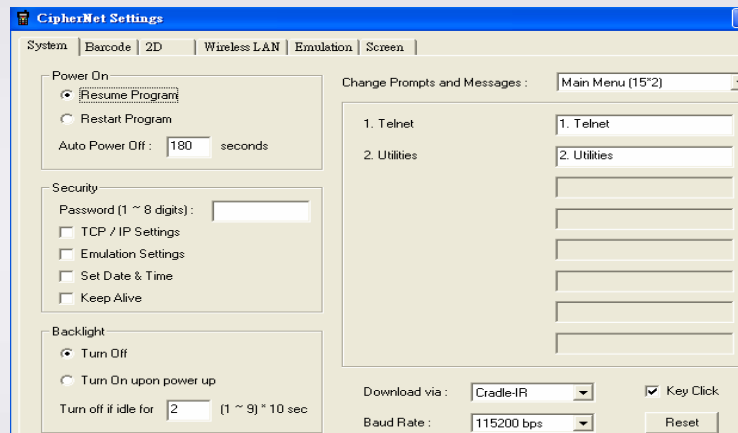
Step 1

- Download the Terminal Emulation program runtime into RF Terminal.
 - Press “7” + “9” + “power” keys simultaneously to enter System Menu
 - Select “6” – Load program, then press “Enter”
 - Select Interface –”2” Cradle IR , then press “Enter”
 - Select Baud Rate –”1” 115200 , then press “Enter”
 - Put the terminal into the Cradle IR
 - Connect the cable to the PC
 - Execute IRLoad.exe on PC
 - Select the proper SHX file of terminal emulation program
 - Select the correct COM port and 115200 as baud rate

Step2

- Configure the settings via CipherNet and download into the portable terminal.

CipherNet.exe



Configure the settings

Download Application

Step3

- Select the option " 1.Telnet" to connect to the server, then start the application



Initialize and connect to the server

Login screen

Select "1"

Init ✓
Wait ✓
Create ✓
Connect ✓

Login:
User:
password:

Select "2"

To Change
TCP
settings

1. TCPIP Settings
2. Emulation Settings
3. Reader Test
4. Backlight
5. Battery Voltage
6. Set Date & Time
7. Baud Rate
8. Download

1. Subnet Mask
2. Default Gateway
3. DHCP Server
4. SSID
5. Terminal IP
6. Host IP or Name
7. Telnet Port
8. View Settings

The Utility : CipherNet

Configuration menu

- System Setting
- Barcode
- Wireless LAN
- Emulation Setting
- Screen Reformat



The screenshot shows a blue header bar with a small icon of a handheld device and the text "CipherNet Settings". Below this is a yellow bar containing six menu items: "System", "Barcode", "2D", "Wireless LAN", "Emulation", and "Screen".

CipherNet Settings

System

Barcode

2D

Wireless LAN

Emulation

Screen

System Setting

Message & Prompt

Power on mode
& Auto power
off period

Security
Protection

Backlight on/off
& period

CipherNet Settings

System | Barcode | 2D | Wireless LAN | Emulation | Screen

Power On

Resume Program

Restart Program

Auto Power Off : 180 seconds

Change Prompts and Messages : Main Menu (15*2)

1. Telnet

2. Utilities

Security

Password (1 ~ 8 digits) : []

TCP / IP Settings

Emulation Settings

Set Date & Time

Keep Alive

Backlight

Turn Off

Turn On upon power up

Turn off if idle for 2 (1 ~ 9) * 10 sec

Download via : Cradle-IR

Key Click

Baud Rate : 115200 bps

Reset

Download interface

Barcode Setting

CipherNet Settings

System | **Barcode** | Wireless LAN | Emulation | Screen

Reader Settings

Scan mode : Laser Read redundancy : None Time out : 3 sec

Barcode & Parameters

<input checked="" type="checkbox"/> Code 39	More...	<input checked="" type="checkbox"/> UPCE	More...	<input type="checkbox"/> RSS 14	More...
<input type="checkbox"/> Italian Pharmacode	More...	<input type="checkbox"/> UPCE Addon 2		<input type="checkbox"/> RSS 14 Limited	More...
<input type="checkbox"/> French Pharmacode	More...	<input type="checkbox"/> UPCE Addon 5		<input type="checkbox"/> RSS 14 Expanded	More...
<input checked="" type="checkbox"/> Industrial 25	More...	<input checked="" type="checkbox"/> EAN 8	More...	<input type="checkbox"/> Telepen	More...
<input checked="" type="checkbox"/> Interleave 25	More...	<input type="checkbox"/> EAN 8 Addon 2		<input checked="" type="checkbox"/> Code 93	
<input type="checkbox"/> Matrix 25	More...	<input type="checkbox"/> EAN 8 Addon 5		<input checked="" type="checkbox"/> Code 128	
<input checked="" type="checkbox"/> Codabar	More...	<input checked="" type="checkbox"/> EAN 13 & UPCA	More...	<input type="checkbox"/> Negative Barcode	
<input type="checkbox"/> MSI	More...	<input type="checkbox"/> EAN 13 Addon 2			
<input type="checkbox"/> Plessey	More...	<input type="checkbox"/> EAN 13 Addon 5			

Advanced... Reset

Reader Settings

Barcode
Types &
Parameters

Advanced Barcode Settings (VT)

Advanced Barcode Settings

Input

- Check Leading Code
- Check Code Length
- Read Partial Code
- Start Position : 1
- Maximum Length : 50

Scanner

- Always enable after login
- Controlled by ESC command
- Enable :
- Disable :
- Auto Enter :
- SwitchKey

Data

- Add Prefix Code
- Add Suffix Code
- Auto Enter
- Char replace

Buzzer

- Good Beep : One-beep
- Bad Beep : Two-beep
- Controlled By Sequence
- Good command
- Bad command

OK Cancel

Data Editing

Scanner Control

Buzzer Control

Advanced Barcode Settings (TN5250)

Advanced Barcode Settings [X]

Input

Check Leading Code []

Read Partial Code

Start Position : [1]

Maximum Length : [50]

Data

Add Prefix Code []

Add Suffix Code []

Good Beep : [One-beep]

Scanner

Always enable after login

Controlled by 5250 command

SwitchKey [Disable]

- Disable
- FN+1
- FN+2
- FN+3
- FN+4
- FN+5
- FN+6
- FN+7
- FN+8
- FN+9
- FN+0

[OK] [Cancel]

Define function key to switch RFID and barcode reader

Data Input

- Check Leading code
- Check Code length
- Read partial code
- Add prefix code/suffix code
- Auto-Enter (**Only for VT**)
- Character Replacement (**Only for VT**)

Scanner & Buzzer control

■ Scanner Control

- Always enable after login
 - ◆ Automatically enable the scanner after login to the server
- Controlled by ESC command **(Only for VT)**
 - The specified ESC sequence can be defined by the user.
 - ◆ **Enable scanner:** By default, the terminal won't enable the scanner until it receives "ESC[99h" from the host
 - ◆ **Disable scanner:** By default, the terminal will disable the scanner if it receives "ESC[99l" from the host.
 - ◆ **Auto Enter**
- Controlled by 5250 command **(Only for TN5250)**

■ Buzzer Control (No beep/one beep/2 beep)

- Good Beep
- Bad Beep
- Control by sequence: Good Beep

(Only for VT)

Bad Beep

Wireless LAN

Security Settings

CipherNet Settings

System | Barcode | 2D | **Wireless LAN** | Emulation | Screen

IP

Enable DHCP Server

Subnet Mask : 255.255.128.0

Gateway : 192.168.1.250

DNS Server : 0.0.0.0

Terminal IP : 192.168.1.241

Local Name :

SSID : WLAN

Security

EAP Identity : Password :
 Share Key
 Open System

WEP Key Length : 64 bits (5 bytes) Active

Key 1:

Key 2:

Key 3:

Key 4:

Login

Host IP or Name : 192.168.1.100 Login Name : new Key : Disable

Telnet Port : 23 Login Password : guest Key : Disable

Keep Alive 0 (minutes) Logout Command : EXIT Key : Disable

Reset

Terminal IP Settings

Login Information

Terminal IP Settings



- Enable DHCP Server

- Terminal IP

- Subnet Mask

- Gateway

- DNS Server

- Local Name

- It defines the name of terminal performing the connection
- The default value: Serial Number
- It represents the **Device Name** for TN5250

- SSID

The values of the 4 fields will be assigned automatically when DHCP is enabled

Security

- Open System
- Share System
- WEP
 - 64 bit (5bytes)
 - 128 bits (13 bytes)

For BT terminals, only key1 is available.
- EAP
 - Only available if AP supports the function
 - Identity
 - Password

Login Information

- Host IP or Name
- Telnet Port
 - Default: “**23**”
- Login Name
- Login Password
- Logout Command
 - To stop the connection and back to the main menu, you need to press **FN + ESC** keys simultaneously.
- mapped Key
 - Define the hot keys for Login Name, Login Password, and Logout Command

Login Information

■ Auto Sign On

- Login to the Server automatically with the defined Login Name and Login Password

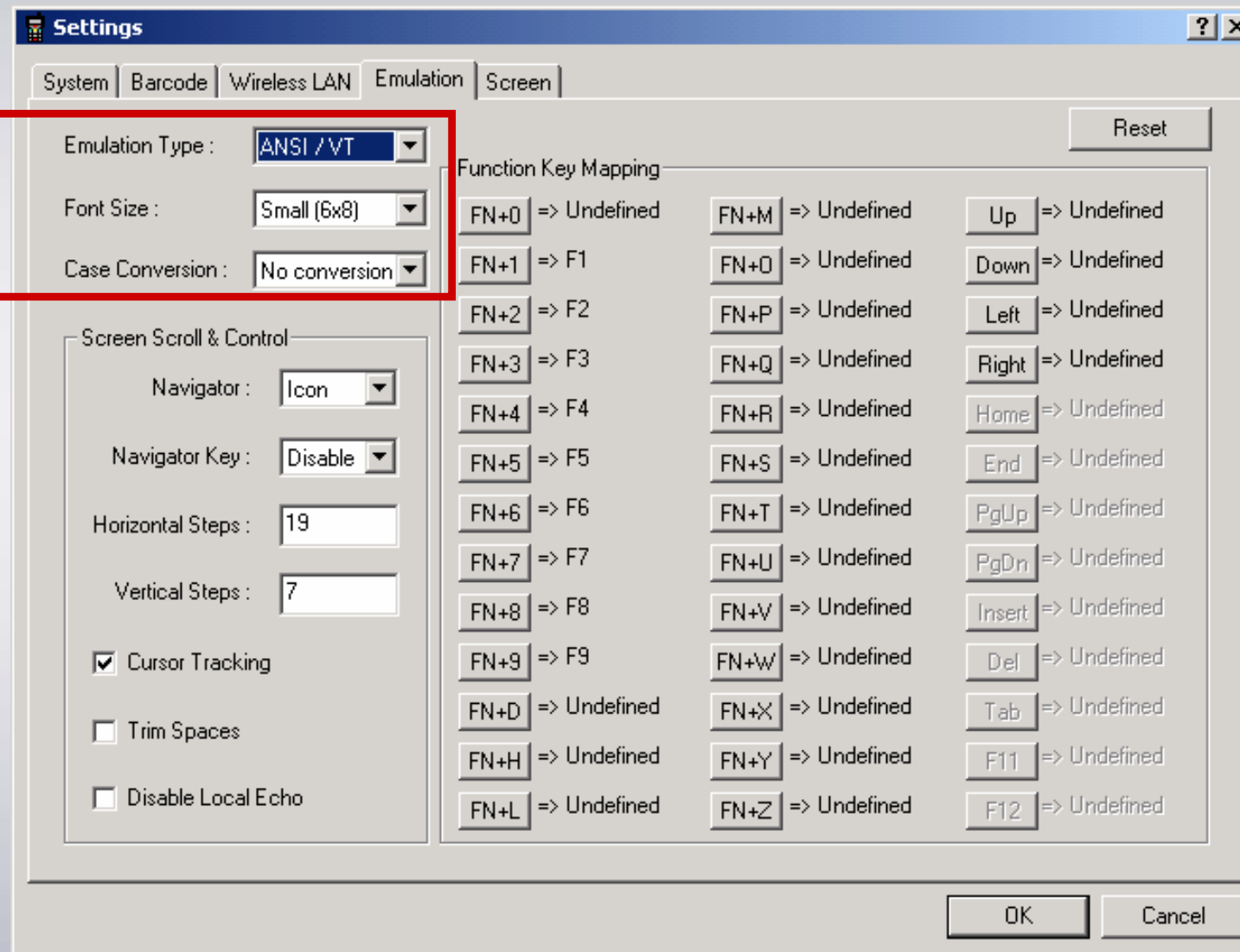
- VT

Username	MICHELLE	Prompt	login:	Key	FN+1
Password :	12345	Prompt	password:	Key	FN+2
Logout	EXIT			Key	Disable
<input checked="" type="checkbox"/> Auto Sign On					Reset

- TN5250

Login Name :	MICHELLE	Key :	FN+1	
Login Password :	12345	Key :	FN+2	
Logout Command :	EXIT	Key :	Disable	
<input checked="" type="checkbox"/> Auto Sign On				Reset

Emulation Setting-VT



The screenshot shows a 'Settings' window with several tabs: System, Barcode, Wireless LAN, Emulation, and Screen. The 'Emulation' tab is active. A red box highlights the 'Emulation Type' dropdown menu, which is set to 'ANSI / VT'. Other settings include 'Font Size' (Small (6x8)) and 'Case Conversion' (No conversion). The 'Function Key Mapping' section contains a grid of function keys (FN+0 to FN+Z) and standard keys (Up, Down, Left, Right, Home, End, PgUp, PgDn, Insert, Del, Tab, F11, F12), all currently set to 'Undefined'. The 'Screen Scroll & Control' section includes 'Navigator' (Icon), 'Navigator Key' (Disable), 'Horizontal Steps' (19), 'Vertical Steps' (7), and checkboxes for 'Cursor Tracking' (checked), 'Trim Spaces' (unchecked), and 'Disable Local Echo' (unchecked). A 'Reset' button is located in the top right corner of the Emulation tab area. 'OK' and 'Cancel' buttons are at the bottom right of the window.

Function Key	Mapping
FN+0	=> Undefined
FN+1	=> F1
FN+2	=> F2
FN+3	=> F3
FN+4	=> F4
FN+5	=> F5
FN+6	=> F6
FN+7	=> F7
FN+8	=> F8
FN+9	=> F9
FN+D	=> Undefined
FN+H	=> Undefined
FN+L	=> Undefined
FN+M	=> Undefined
FN+O	=> Undefined
FN+P	=> Undefined
FN+Q	=> Undefined
FN+R	=> Undefined
FN+S	=> Undefined
FN+T	=> Undefined
FN+U	=> Undefined
FN+V	=> Undefined
FN+W	=> Undefined
FN+X	=> Undefined
FN+Y	=> Undefined
FN+Z	=> Undefined
Up	=> Undefined
Down	=> Undefined
Left	=> Undefined
Right	=> Undefined
Home	=> Undefined
End	=> Undefined
PgUp	=> Undefined
PgDn	=> Undefined
Insert	=> Undefined
Del	=> Undefined
Tab	=> Undefined
F11	=> Undefined
F12	=> Undefined

Function Key Mapping for VT series

- Re-define the Key Code (Escape Sequence)

Function Key Mapping [X]

FN+4 => nil + F4

Key Code => ESC O S

Undefined
F1
F2
F3
F4
F5
F6
F7
F8

OK

Emulation Setting-TN5250

The screenshot shows the 'Settings' dialog box with the 'Emulation' tab selected. The dialog is divided into several sections:

- Language:** Single Byte Character
- Font Size:** Small (6x8) (selected), Large (8x16)
- Field Length if Exceed:** Reject (selected), Truncate, Split To Next Field
- Lock Screen:** X: 0, Y: 0, Lock Screen (unchecked)
- Screen Scroll & Control:** Navigator: Icon
- Navigator Key:** Disable
- Horizontal Steps:** 19
- Vertical Steps:** 7
- Cursor Tracking:** Checked
- Trim Spaces:** Unchecked
- Disable Local Echo:** Unchecked
- Remove Empty Line:** Unchecked
- Message:** Line Number: 24, Function Key: Disable, Time Out (Second): 3, Exclude String: COPYRIGHT
- Function Key Mapping:** A grid of function keys (FN+0 to FN+Z) and standard keys (Up, Down, Left, Right, Home, End, PgUp, PgDn, Insert, Del, Tab, F11, F12) mapped to 'Undefined'.

Red boxes highlight the Language, Font Size, Field Length if Exceed, Lock Screen, and Message sections.

General Emulation Settings

■ Screen Scroll & Control

- Navigator
 - ◆ None
 - ◆ **Icon**
 - ◆ 20x15
 - ◆ 30x24
- Navigator Key
 - ◆ Enable/Disable Navigator by a pre-defined function key
- Horizontal Steps & Vertical Steps
 - ◆ The unit per step is actually one character.
- Cursor Checking
- Trim Spaces
- Disable Local Echo

■ Font Size

■ Function Key Mapping

- F+0~F+9, F+Q~F+Z

Different Emulation Settings



■ VT

- Case Conversion
 - ◆ No conversion
 - ◆ Convert to lower case
 - ◆ Convert to upper case

■ TN5250

- Field Length if Exceed
 - ◆ Reject
 - ◆ Truncate
 - ◆ Spilt To Next Field
- Lock Screen
 - ◆ when enabled, screen of terminals will be fixed at a designated position from the original screen (from host)
- Message
 - ◆ Line Number: default - line25
 - ◆ Function: recall the message again with function key
 - ◆ Time-out: decide how long the dialogue box will stay on the terminal's screen
 - ◆ Exclude String : To filter unnecessary message string

Lock Screen

■ Example of Lock Screen

Screen is not locked

(0,0)

X,,Y

Screen on 8370 (20x8)

Screen from the host

X and Y both at 0

Screen is locked

(10,10)

X,,Y

Screen on 8370 (20x8)

Screen from the host

X=10, Y=10

Screen Format

- Purpose: reformat the host screens to smaller screens that can fit into the terminal
- Procedures:
 - Screen Capture
 - Screen Reformat



Arrow Right

```
MAIN                               Menu principale AS/400                Sistema:  IDEA
Scegliere una delle seguenti opzioni:

  1. Attivit{ utente
  2. Attivit{ Office

  4. File, librerie e cartelle

  6. Comunicazioni

  8. Gestire i problemi
  9. Visualizzare un menu
 10. Opzioni Supporto informativo
 11. Attivit{ Client Access/400

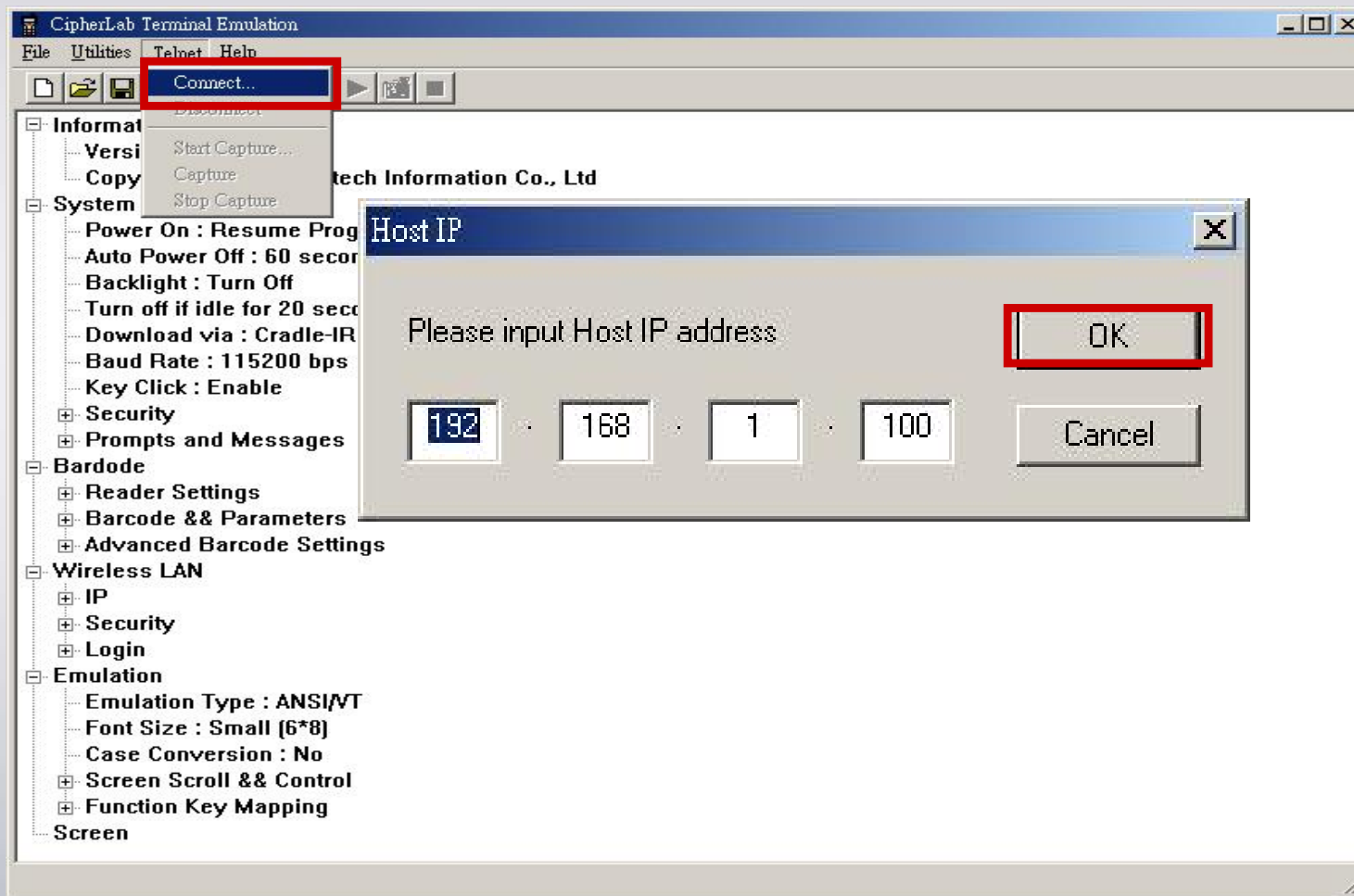
 90. Scollegamento

Scelta o comando
=>

F3=Fine  F4=Richiesta  F9=Duplicazione  F12=Annullamento
F13=Supporto informativo  F23=Impostazione menu iniziale
(C) COPYRIGHT IBM CORP. 1980, 2000.
```

Screen Capture- (1)

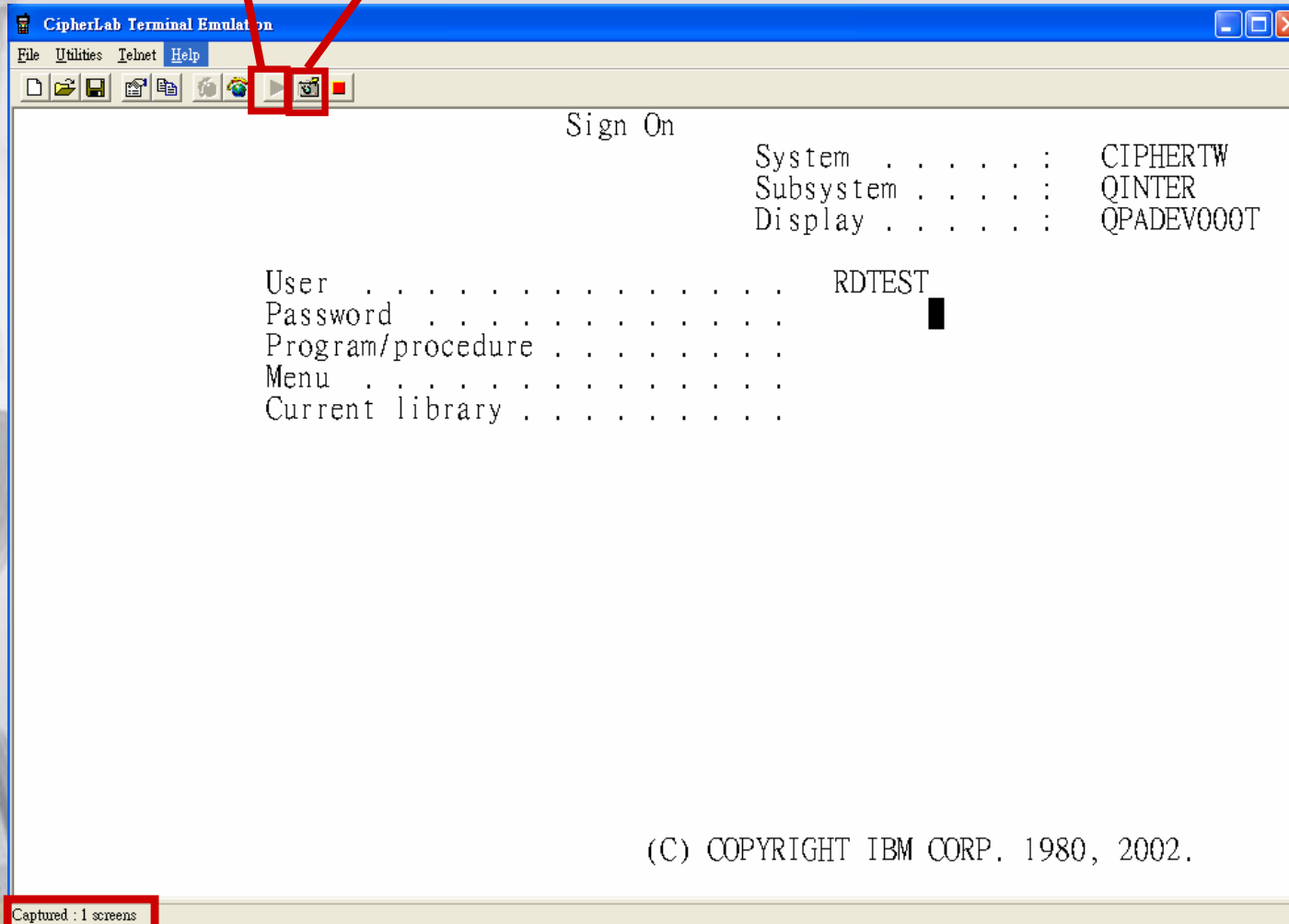
■ Connect to the Host



Screen Capture- (2)

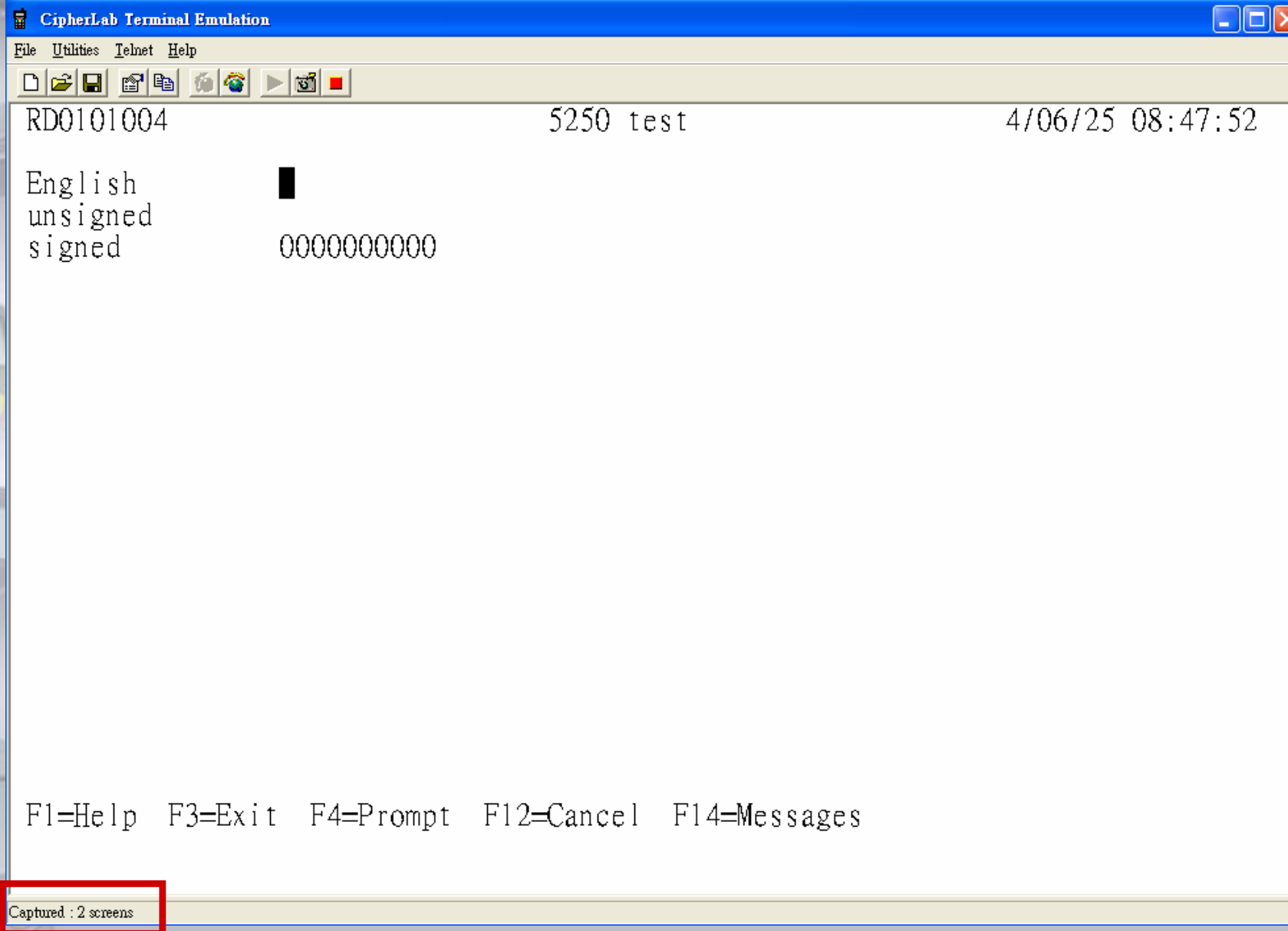
Start to record
and save as *.scr

Capture this
screen



Display the
captured pages 32

Screen Capture- (3)



Screen Re-format (VT Series)

Open the .scr file

Load Host Session Screens... Total Pages : 2
Delete Current Page ... Current Page : 1

Sign On
System
Subsystem
Display
RDTEST

Host Row	Column	Terminal Screen	Line No.
nil	1	Sign on	1
nil	1		2
6	53	User: _____	3
7	53	Password: _____	4
nil	17		5
nil	1		6
nil	1		7
nil	1		8

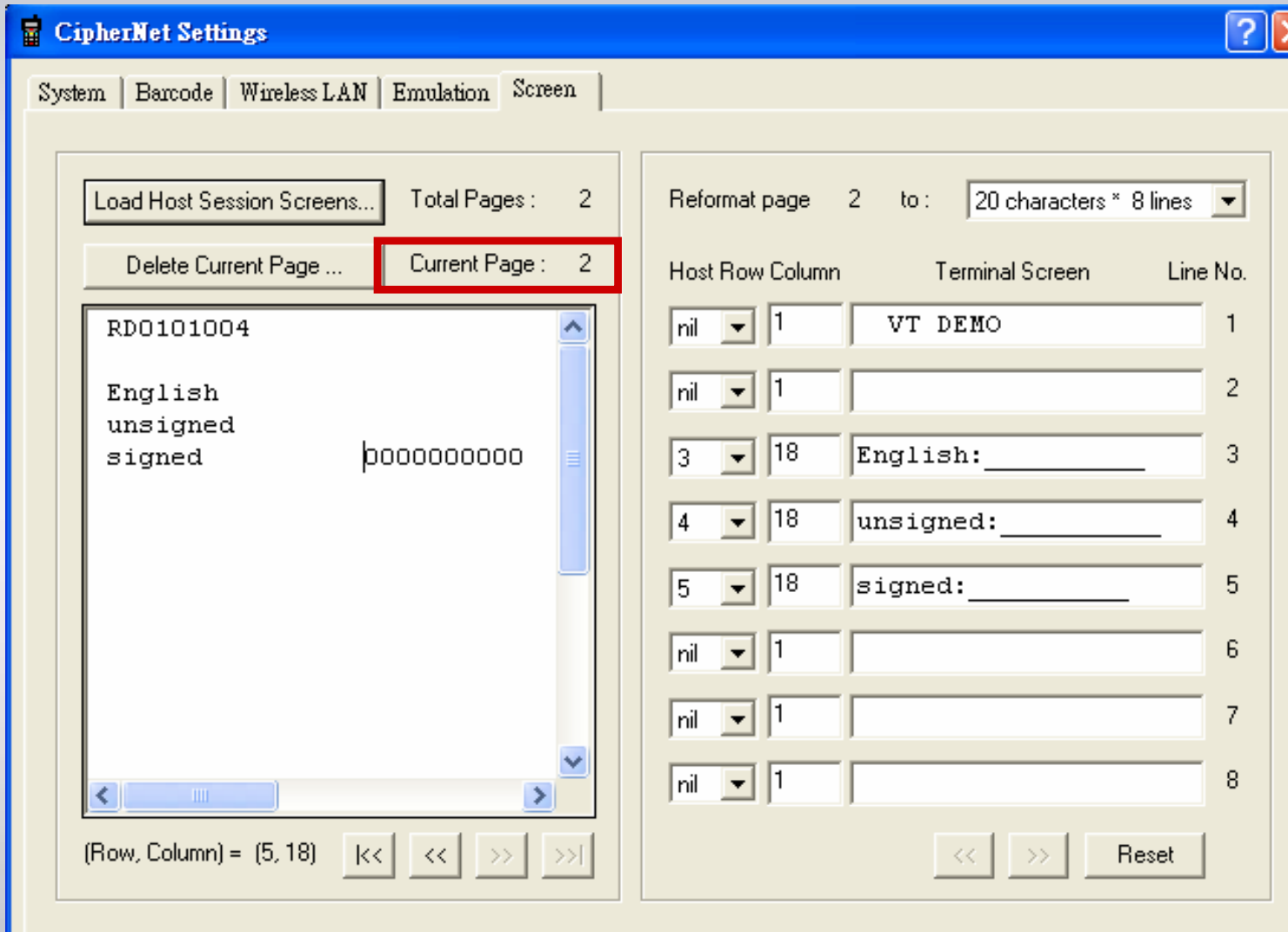
(Row, Column) = (6, 53)

Re-define the prompts

Use underline to re-define the input field and length

The position to start to input

Screen Re-format (VT Series)



CipherNet Settings

System | Barcode | Wireless LAN | Emulation | **Screen**

Load Host Session Screens... Total Pages : 2

Delete Current Page ... **Current Page : 2**

RD0101004

English
unsigned
signed |0000000000

(Row, Column) = (5, 18) |<< << >> >>|

Reformat page 2 to : 20 characters * 8 lines

Host Row	Column	Terminal Screen	Line No.
nil	1	VT DEMO	1
nil	1		2
3	18	English: _____	3
4	18	unsigned: _____	4
5	18	signed: _____	5
nil	1		6
nil	1		7
nil	1		8

<< >> Reset

Screen Re-format (TN5250)

Open the *.scr file

CipherNet Settings

System | Barcode | Wireless LAN | Emulation | Screen

Load Host Session Screens... Total Pages : 2

Delete Current Page ... Current Page : 1

Sign On

```
System . . . . .
Subsystem . . . . .
Display . . . . .

. . . . . RDTEST
. . . . . RDTEST
```

(Row, Column) = (5, 52)

Reformat page 1 to: 20 characters * 8 lines

Field	x	y	Terminal Screen	Line No.
nil			TN5250 Login	1
1	52	5	User:	2
2	52	6	PWD:	3
nil				4
nil				5
nil				6
nil				7
nil				8

<< >> Reset

Re-define the prompts

Only input the necessary prompts and underline is not necessary for TN5250

Select the Field, then position will be displayed automatically

Screen Re-format (TN5250)

CipherNet Settings

System | Barcode | Wireless LAN | Emulation | **Screen**

Load Host Session Screens... Total Pages : 2

Delete Current Page ... **Current Page : 2**

RD0101004

English unsigned signed

ABCDEF 0000000000

(Row, Column) = (2, 17)

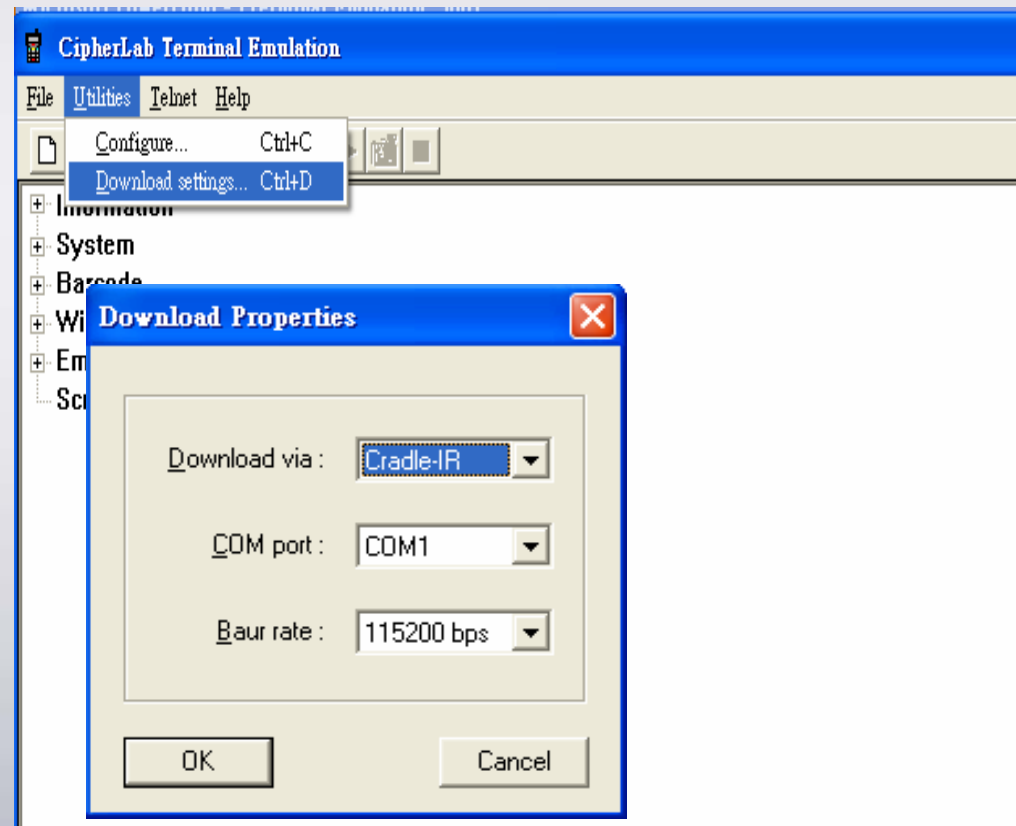
Reformat page 2 to: 20 characters * 8 lines

Field	x	y	Terminal Screen	Line No.
nil			TN5250 Test	1
1	17	2	English:	2
2	17	3	ungisnged:	3
3	17	4	signed:	4
nil				5
nil				6
nil				7
nil				8

<< >> Reset

Download the settings

- Save as *.NET file
- Download to terminal
 - Via Cradle-IR
 - Via Direct RS232
 - Via IRDA
 - Via **RF**



Activation Key

- **"Screen Capture"** is locked with a "key" which will be generated according to the S/N of the Terminal.
- Without the activation key, the "screen capture" function will not work and **"Not activated yet!"** message will be displayed on terminal when trying to connect to the host
- Without the activation key, the program still can run the full screen emulation by using scroll and other screen control
- The VT and TN5250 emulation programs can share the same key in the same terminal

How to input the Activation Key?

- Please contact us if you need the Key for Demo
 - 1. Power on terminal and select "2"-Utilities
 - 2. Select "2"-Emulation settings
 - 3. Select "8"-Activation key
 - 4. Scan the label or key in the **15** digits of number, then press "Enter" key
 - 5. Press "ESC" key to back to main menu.

Debug Mode

- Purpose: record the log file
- Save as DAT file
 - Press “**FN**” + “**0**” in main menu
 - Execute 232_Read.exe/IR_Read.exe to upload (115200)

```
Send:08:58:41
]AH20010D

Recv:08:58:41
1B [0m1B [H1B [2J94/H-20-01/ 240D
0A
9045110D
0A
TRUTA SALATWURS0D
0A
  Col/ 5 St0D
0A
_1B [2l
Recv:08:58:41
1B [4;1H 11B [4;1H__11B [4;1H
Send:08:58:42
0D
```



Glossary

TN5250 Keyboard Layout –(1)

PC Keys	TN5250	Description
F1~F12	PF1~PF12	Function keys
Shift+(F1~F12)	PF13~PF24	Function keys
Ctrl+F1	ATTN	Attention key
Ctrl+F2	SYSREQ	Sys Req key
Ctrl+F3	INSERT	Insert key
Ctrl+F4	ERASEINPUT	Erase all input
Ctrl+F5	DUP	DUP key
Ctrl+F8	LAST	Position cursor after the last character in a field
Ctrl+F9	BEGIN	Go to start of a field
Ctrl+F10	END	Go to last position of a field
Ctrl+Shift+F2	CLEAR	Send CLEAR to IBM host
Ctrl+Shift+F11	REAL-	Normal - key
Ctrl+Shift+F12	REAL+	Normal + key

TN5250 Keyboard Layout –(2)

PC Keys	TN5250	Description
HOME	RECORD	Record Backspace
ENTER	FIELDEXIT	Field exit key
END	LAST	Position cursor after the last character in a field
PLUS	FIELD+	Field + key
MINUS	FIELD-	Field - key
PGUP	PGUP	Send Page up
PGDN	PGDN	Send Page Down
ESC	RESET	Open keyboard
RETURN	ENTER	Send ENTER key to IBM host
CTRL+ENTER	NEWLINE	Go to next line
BACKSPACE	LEFTDELETE	Character to the left of the cursor is removed
TAB	NEXT	Jump to next field
SHIFT+TAB	PREVIOUS	jump to the start of the current field, and if at the start of a field, to the previous field