EK-VT38T-UG-001

VT382

Thai Display Terminal
Installing and Using Manual

1st Edition, August 1989

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DECSYSTEM-20	LN01,LN03	RSTS	VT330,VT340
DECtalk	LQP02,LQP03	RSX	Work Processor

CONTENTS

ABOUT THIS MANUAL

This manual provides the information you need to install and operate.

1 ORGANIZATION

This manual has 7 chapters, 4 appendices.

- Chapter 1. "A Look at the Terminal," gives you an overview of the VT382 terminal and its features.

Installing Your VT382 Video Terminal

- Chapter 2, "Installation," shows you how to install your terminal. And this chapter describes how to set your terminal's communication features to match your installation.

Using Your VT382 Video Terminal

- Chapter 3, "Using VT382 ," describes the terminal's keyboard and explains the general function of each key. The chapter also describes the terminal's operating controls, connectors, and indicators.
  And this chapter gives you an overview of the "User-Defined Keys."

- Chapter 4, "Using Set-Up," describes how to use the VT382 set-up screens. You use set-up to examine and change the settings of operating features from the keyboard.

- Chapter 5, "Printers and Modems," describes how to use a printer or modem with your terminal.

- Chapter 6, "Communication," gives you an overview of data communication on your VT382.

- Chapter 7, "Solving Problems and Getting Service," provides suggested solutions for typical operating problems and tells you where to get more help.

- Appendix A lists VT382 specifications.

- Appendix B provides ordering information for documentation.

- Appendix C is a primer on how to use VT382 control functions. Programmers use control functions in applications, to make the terminal perform different actions.

- Appendix D is a primer of Thai input method.

2 CONVENTIONS

2.1 Warnings, Cautions, And Notes

Warnings, cautions, and notes appear throughout this manual. They have the following meanings.

- Warnings provide information to prevent personal injury.
- Cautions provide information to prevent damage to equipment.
- Notes provide general operating information.

2.2 Set-Up Features And Keyboard Keys

Set-up features and keyboard keys are written with "".

(Examples)

Press the "Return" key.
Use the "Clear Communications" feature in the "Set-Up Directory" screen

CHAPTER 1

A LOOK AT THE TERMINAL

This chapter introduces you to VT382-TB, Thai text terminal in the VT series. This manual uses the term "VT382" when describing features common to VT382-TB.

The chapter provides an overview of the terminals and their basic operating features. It also tells you where to look in this manual for more information about each feature.

1.1 VT382 COMPONENTS

The VT382 has two main components, a monitor/terminal unit and a keyboard (Figure 1-1). The monitor/terminal unit is simply called the terminal in the rest of this manual.

1.1.1 Terminal

The VT382 uses a 350 mm (14 inch) flat monochrome screen. The VT382 screen can display 24 lines of text, in 80 or 132 columns as ASCII and Thai Line. 25 is reserved for the terminal's status line.

There are five connectors on the rear of the terminal. Two connectors are for a host system, one is for keyboard, one is for AC power , and one is for a printer.

The terminal's tilt and swivel base lets you adjust the screen to the viewing angle you prefer.

Chapter 3 describes the terminal's controls and connectors.

1.1.2 Keyboard

The keyboard has four groups of keys and four indicator lights. A cable connects the keyboard to the rear of the terminal.
Chapter 3 describes the keyboard.

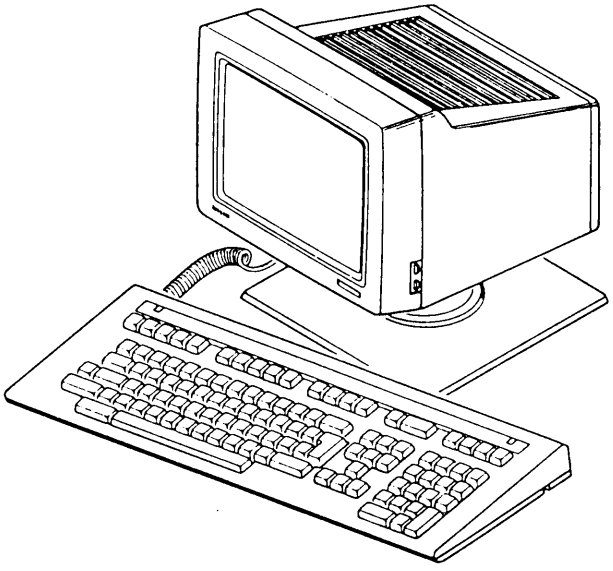


Figure 1-1 VT382 Video Terminal

1.2 YOUR COMPUTER SYSTEM

You have several ways for connecting your terminal to a computer system. You can connect the VT382 directly to a computer, or indirectly through a terminal server or modem. The system you connect to is called the host.

Normally, in English input mode and Thai input mode, you can send information to the host by typing the keyboard.
Usually the host sends back data to the terminal, and the data is displayed on the screen.

You can also print the data displayed on the screen by connecting a printer to the terminal.

1.3 FEATURES

The VT382 has many features. Here are some of the main features.

Feature	Function
Set-Up	Select operating features from the keyboard.
Status line	Indicate the operating status of the VT382.
User-defined keys	Define special functions for 15 keys.
Sixel Graphics	Display images created with Sixels drawing systems.
CRT Saver	Screen goes blank if the terminal is inactive for 30 minutes.
Thai input mode	Input Thai characters with sequence check.

1.3.1 Set-Up

Set-up is a series of display screens that let you examine and change the terminal's operating features from the keyboard. Each screen lists a particular set of operating features for the terminal. For example, one set-up screen lists communication features, while another lists keyboard features.

Some features are for your convenience, and some are required to connect your host. Each set-up feature has a factory-default setting. You can select the settings that are match to your system.

Chapter 4 describes set-up in detail.

1.3.2 Status Line

The VT382 displays a status line at line 25 of the screen by default. The status line has several fields that provide information about the terminal. For example, one field shows you which printer mode is selected. Applications may also use the status line to send you messages.

Chapter 3 describes the status line.

1.3.3 User-Defined Keys

You can define the function of 15 keys on the top row of the keyboard. The VT382 lets you use simple text to define those keys. You use the "User-Defined Key Set-Up" screen to define keys.

Chapter 3 gives you an overview of User-Defined Keys. Chapter 4 describes the "User-Defined Key Set-Up" screen.

1.3.4 Sixel Graphics

You can use the VT382 to display graphic images through sixel method. The screen has a resolution of 960 horizontal pixels by 720 vertical pixels. Pixels, or picture elements, are the individual dots that make up the characters you display on your screen. A pixel is the smallest unit you can display.

An application can turn individual pixels on or off.

Drawing graphics requires some programming knowledge. The "VT382 Programmer Reference Manual" describes how to use Sixel graphics.

1.3.5 CRT Saver

The VT382 has a CRT saver feature to extend the life of the terminal's CRT. The screen automatically goes blank if the terminal is inactive for 30 minutes (no keyboard activity or no input from the host). You do not lose the data that was displayed. To reactivate the screen, press any key.

1.3.6 Thai Input Mode

You can input Thai characters from the keyboard, by using Thai input mode.

1.3.7 Emulating VT Series Terminals

The VT382 can operate like other VT series text terminals. This feature is useful when your system has applications designed for those terminals.

The VT382 can emulate the following terminals besides VT300 series functions.

VT200 series
VT100 series
VT52

To make the VT382 emulate another terminal, you use the "Terminal Mode" feature in the "Terminal Set-Up" screen. See the "Terminal Set-Up" section of Chapter 4.

1.3.8 Character Sets

The VT382 provides different character sets for use with different types of computer systems.

When you first use your VT382, the terminal is set to the ASCII and Thai character set. And VT382 provides DEC Special Graphics, UPSS(User-Preference Supplemental Set), DEC Supplemental, ISO Latin-1 Supplemental, DEC Technical, DRCS(Dynamically Redefinable Character Set, User-Defined Character Set) character sets.

The "VT382 Programmer Reference Manual" shows the characters in each character set.

See "Terminal Set-Up" in Chapter 4.

1.4 PROGRAMMING THE TERMINAL

A programmer reference manual is prepared for VT382.

- VT382 Programmer Reference Manual (EK-VT38T-RM)

The manual explains the control functions used to the terminal's features. Programmers can use these functions in their applications. You should have some programming experience before you use the programmer reference manual.

Appendix C of this user guide is a summary of control functions in an application.

CHAPTER 2

INSTALLATION

This chapter provides step-by-step instructions to install your VT382. Complete all the steps in order.

2.1 UNPACKING

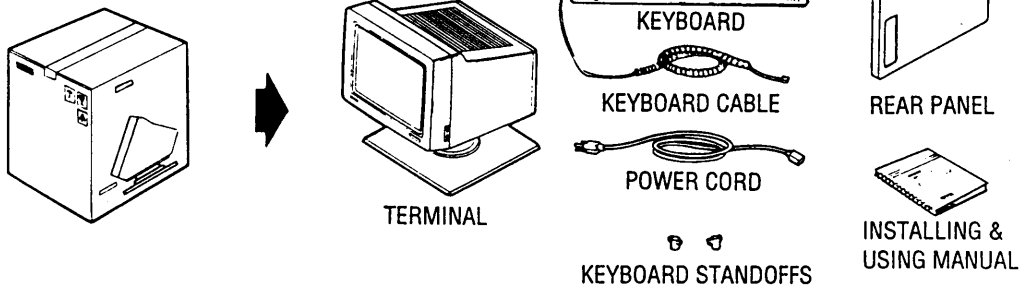
Unpack and check the content of the carton.

WARNING: Two people is required to lift the terminal. The VT382 weights 10.8 kg.

Check damages and missing.

If there are damages, then

- Stop unpacking.
- Identify the items.
- Contact your sales representative.



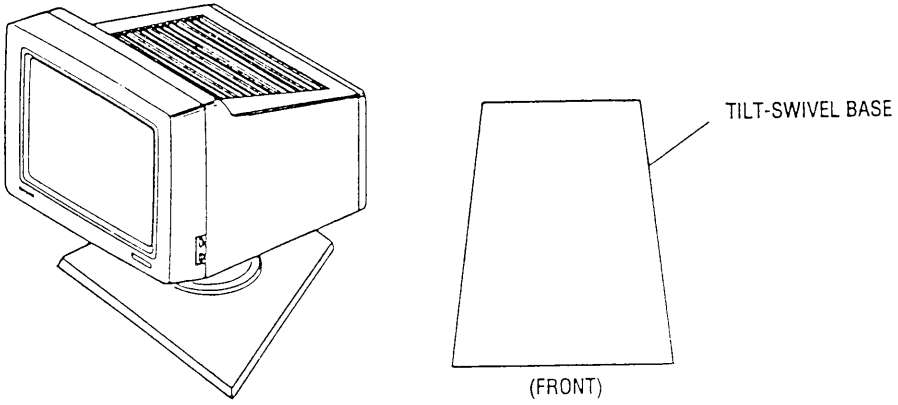
2.2 INSTALLATION

1. Place the terminal on a level surface.

CAUTION : Do not place the terminal on top of the host system. You may damage the host system.

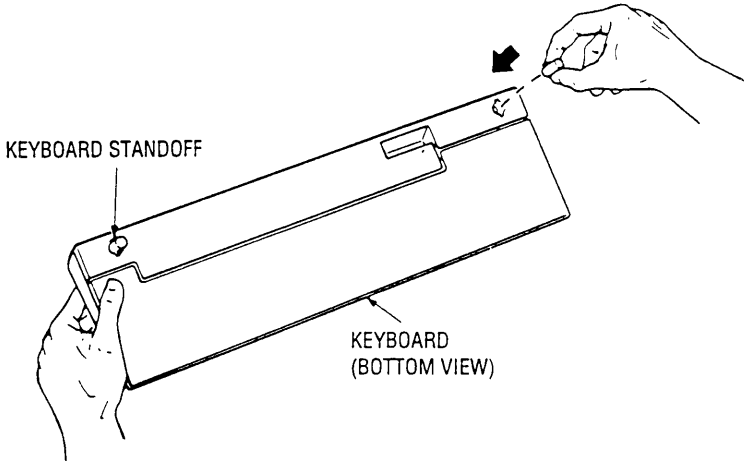
Do not place objects on top of the terminal. They may block the cooling vents, causing the terminal to overheat.

2. Turn the terminal until the screen faces to the front of tilt-swivel base.



3. Install the keyboard standoffs.

Keyboard standoffs adjust the height of the keyboard. If you don't need, go to next step.

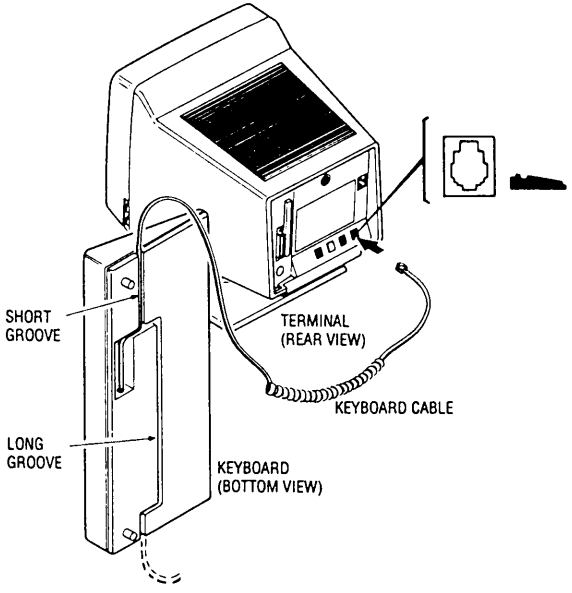


4. Connect the keyboard to the terminal.

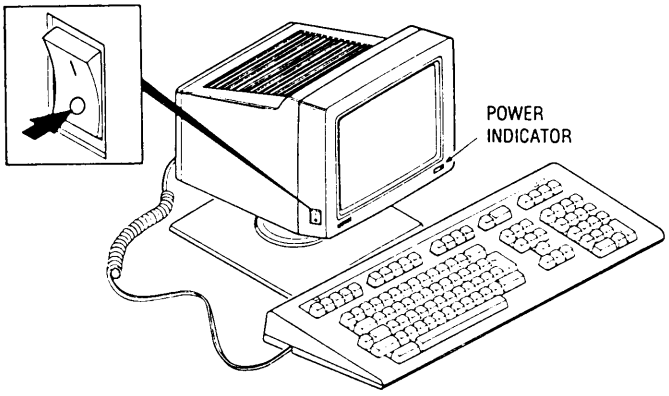
   - The keyboard cable is already connected to the bottom of the keyboard and routed to the left.

     If you want the keyboard cable routed to the right, remove the cable from the short groove and press the cable into the long groove.

   - Insert the other end of the cable into the keyboard connector on the rear of the terminal.

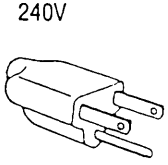


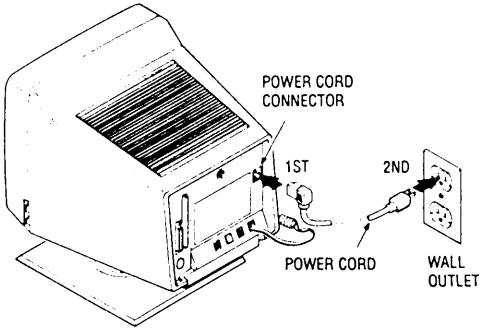
5. Make sure the power switch is in the off (0) position.



6. Plug the power cord into the power cord connector on the terminal, then into the wall outlet.

Warning: You have to use the cable in the carton and the specific receptacle.

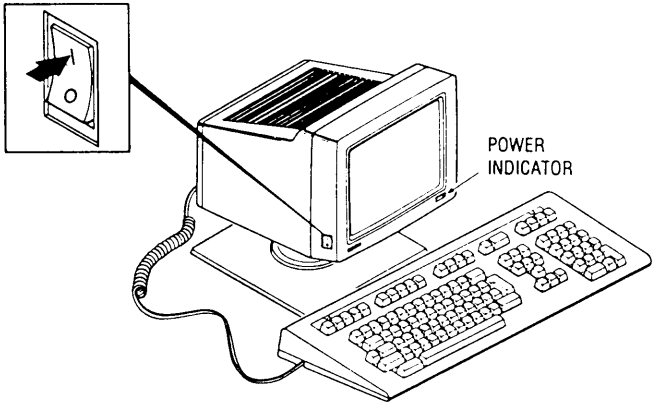




7. Start up your terminal.

   . Turn the power switch on by pressing 1.

   . Make sure the green power indicator is on, it takes around 3 seconds after turning the power switch.



   . Wait about 20 seconds for a "VT382 OK" message to appear on the screen. At the same time, a bell tone sounds from the keyboard.

NOTE

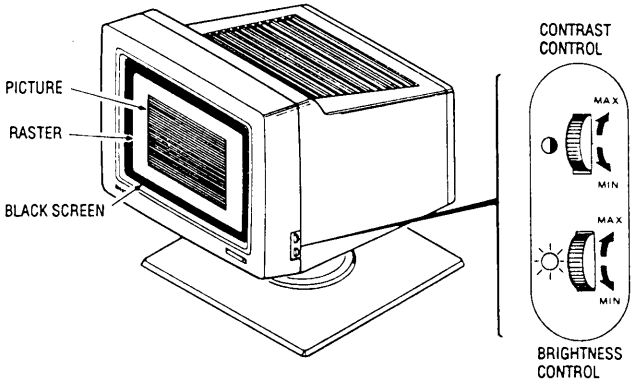
If you have problems, see the "Problem Solving" section at the end of this chapter.

8. Set the brightness and contrast controls.

   . Increase both the brightness and contrast to maximum.

   . Decrease the brightness until the raster just disappears.

   . Adjust the contrast for your viewing preference.



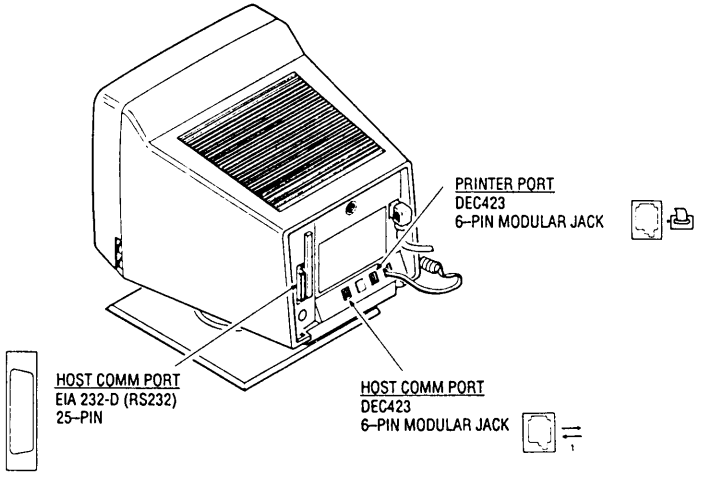
9. Adjust the tilt-swivel stand to a comfortable viewing angle.

To set the angle, tilt the terminal forward (5 degrees) or backward (20 degrees) to the desired position. You can turn the terminal to any viewing position.

CAUTION: The terminal does no swivel in a complete circle. If you try to swivel the terminal in a complete circle, you may damage the base.

10. Identify the cable connectors.

Make sure how to connect the cable from your host system.
Use the following picture to identify the cable connectors.



11. Connect your communication cable to the rear of the terminal.

CAUTION: Turn the power switch off (0) before connecting cable.

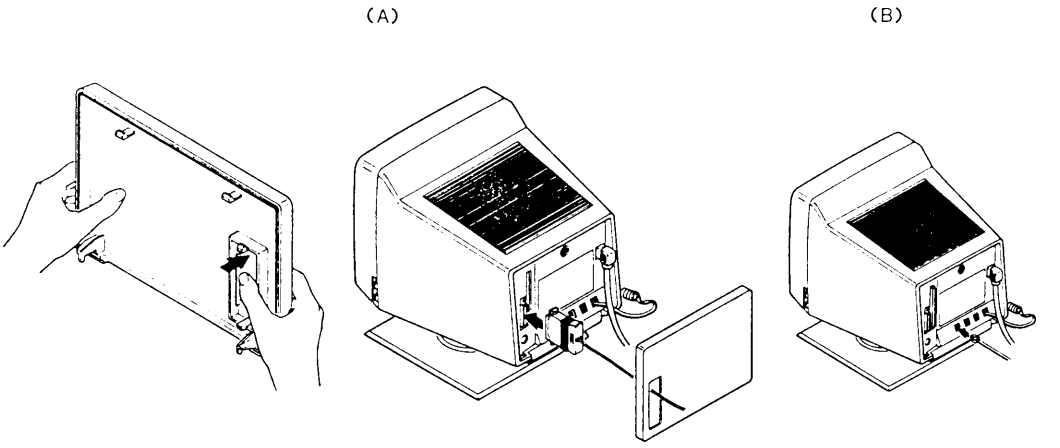
There are two ways you can connect a cable to the host.

A. Connect an EIA 232-D (RS-232-C) cable to the 25-pin connector.

OR

B. Connect a DEC-423 cable to the 6-pin connector.

In case A, remove the filler panel on the rear panel and feed the cable through the opening and fix the connector with the screws.



IMPORTANT: After you install the VT382, you must set the terminal's operating features to match this cable connection. "Communications Port Set-Up" in this chapter shows you what features to set.

12. After you connect the cable, turn the power switch on by pressing 1.

13. Install the rear panel.

- Insert the legs of the panel into the bottom slots of the terminal.
- Lift the panel and snap it into place.

You have installed your VT382 successfully. Go to next section, and set communication features.

2.3 COMMUNICATION SET-UP

All VT382 operating features are already set to factory-default setting that works with most Digital systems.
You may have to set some features to match your host system.

For example,

- "Host Port Selection".
- "Transmit Speed" and "Receive Speed".

This section describes guideline of these features. Chapter 4 gives you details about each Set-Up.

It is recommended to save operating features by using "Save" function in Set-Up, when you change the settings. Then VT382 keeps the new operating features even after the power off.

2.3.1 Host Port Selection

Host communication port on VT382 is selected from "RS232" or "DEC423".
The factory-default setting is "RS232". So if you use "DEC423" port, you must change the setting.

See "Communications Port Set-Up" screen in Chapter 4.

2.3.2 Selecting The Correct Baud Rate

The VT382 is initially set a baud rate to 9600. This setting works with most Digital systems. The baud rate setting must match the baud rate of your host system. If you are unsure what baud rate your host system uses, ask your system operator or system manager.

To set the baud rate, You use the "Transmit Speed" and "Receive Speed"

features on the "Communications Port Set-Up" screen.
See Chapter 4.

NOTE

It is needed that Transmit Speed on VT382 matches Receive Speed on host system, and Received Speed on VT382 matches Transmit Speed on host system.
The initial setting for Receive Speed is "receive = transmit", but when Transmit Speed and Receive Speed on host system are different each other, you must set the each correct baud rate.

If you can not communicate with the host after above setting, make sure other communication features, for example "Data Bits/Parity", "Stop Bits".
See Chapter 4 for detail.

2.4 PROBLEM SOLVING

Problem	Suggested Solution
The power indicator is off.	Check the wall outlet. Make sure the power cord connections are secure.
The power indicator is on, the keyboard bell tone sounds, and the screen is blank.	Adjust the brightness and contrast, until "VT382 OK" appears on the screen. The terminal has a CRT saver that turns off the screen display if you do not use the terminal for 30 minutes. Press any key to reactivate the screen displa
The bell tone does not sound when you turn the terminal on. The keyboard indicator lights are off.	Make sure the keyboard is connected to the terminal.
Any message other than "VT382 OK" appears.	See Chapter 7.

CHAPTER 3

USING VT382

This chapter describes the operating controls and connectors on the terminal.
The chapter also describes the basic function of each keyboard key, the status line, and the guideline about User-Defined Keys, The last section describes the specific input mode.

3.1 TERMINAL

3.1.1 Terminal Controls

The terminal has a power switch on the left, and brightness and contrast controls on the right (Figure 3-1). Table 3-1 describes their function.

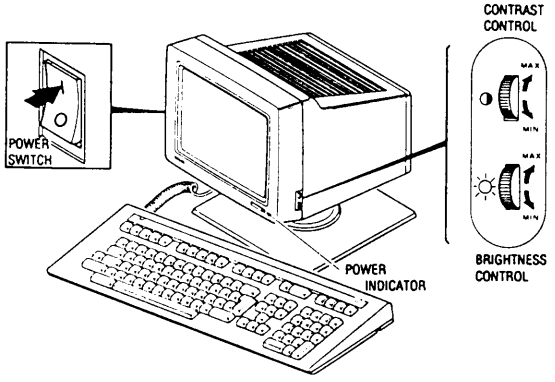


Figure 3-1 Controls and Power Indicator

Table 3–1 Controls

Control	Function
Power switch	Turns the terminal power on or off. Press 1 to turn the terminal power on. Press 0 to turn the terminal power off.
Power indicator	Stays on while the terminal is on and receiving the correct power.
Contrast	Adjusts the degree of contrast on the screen. Contrast is the difference in shade between the image you display and the screen background.
Brightness	Adjusts the degree of brightness on the screen.

3.1.2 Terminal Connectors

Figure 3–2 shows the connectors on the rear of the terminal. Table 3–2 describes their function.

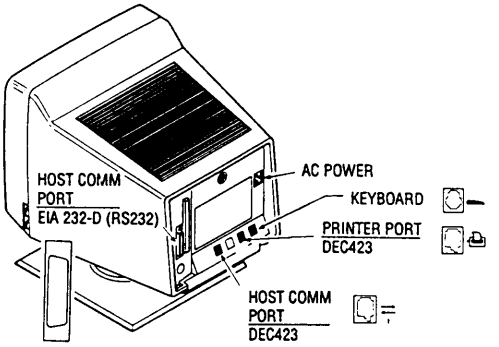


Figure 3–2 Connectors

Table 3-2 Connectors

Connector	Function
Host Comm Port RS232 (25-pin)	Connects the VT382 to host computer, directly or indirectly (through a terminal server or modem).
Host Comm Port DEC423 (6-pin)	Connects the VT382 to host computer, directly or indirectly (through a terminal server).
Printer Port DEC423 (6-pin)	Connects a printer to the VT382.
Keyboard	Connects the keyboard to the terminal.
AC power	Connects the power cord to the terminal.

3.1.3 VT382 Cursors

The cursor indicates where the next character will appear on the screen. The standard VT382 cursor is a blinking block. You can change this cursor to a steady block, or to a blinking or steady underline. To change the cursor, you use the "Cursor Style" and "Cursor Blink" features in the "Display Set-Up" screen (Chapter 4).

3.2 KEYBOARD

3.2.1 Keyboard Layout

The keyboard has four groups of keys and four indicator lights (Figure 3-3).
The keys are grouped by function.

Main keypad
Editing keypad
Numeric keypad
Top-row function keys

The keyboard also has two audible indicators, a keyclick and bell.

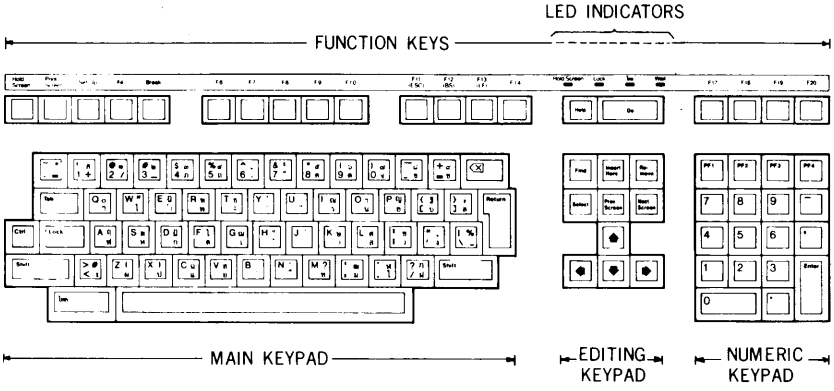


Figure 3-3 VT382 keyboard

3.2.2 Main Keypad

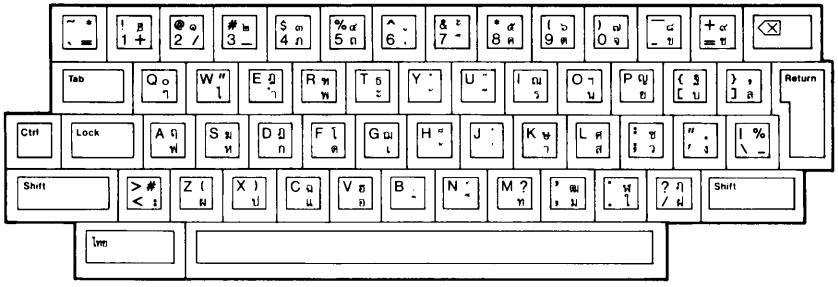


Figure 3-4 Main Keypad

Figure 3-4 shows the main keypad, which includes standard alphanumeric characters, punctuation marks for English input mode, and Thai Elements for Thai input mode.

In English input mode, usually the keys in main keypad send ASCII code.

In Thai input mode, You can compose Thai characters by using the main keypad.
See Appendix D for detail about Thai input methods

When the VT382 is on-line, the terminal sends the characters you type to the host. The host usually sends these characters back to the terminal for display on the screen.

In English input mode, the main keypad also has the following special function keys.
In Thai input mode, some of them are used as special key for Thai input methods.

Tab

Pressing "Tab" sends a horizontal tab, which normally moves the cursor to the next tab stop. You can select the tab stops on the "Tab Set-Up" screen (Chapter 4). Applications can also change tab stops.

Ctrl

Holding down "Ctrl" and pressing another key sends a control code to the host.

In this manual, keystrokes that use the "Ctrl" key appear as follows.

"Ctrl-(other key)"

For example, "Ctrl-Z" means to hold down "Ctrl" and press the "Z" key.

Lock

Pressing "Lock" key ("Lock indicator" turns on) makes the alphabetic keys send their uppercase characters.
Pressing the "Lock" key again ("Lock indicator" turns off) makes the alphabetic keys send their lowercase characters.

If you set the "Lock Key" feature in the "Keyboard Set-Up" screen to "shift lock", the "Lock" key makes all keys send the top character on the key.

Shift

The "Shift" key has three functions.

. Holding down "Shift" and pressing a standard key sends the uppercase character (or top character) on the key.

. Holding down "Shift" and pressing a special-function key starts a predefined control function.
In this manual, a control function using "Shift" appears as follows.

"Shift-(other key)"

For example, "Shift-Print Screen" means to hold down "Shift" while pressing the "Print Screen" key.

. Holding down "Shift" and pressing a user-defined key (UDK) sends a UDK function.

Return — Pressing "Return" sends either a carriage return or a carriage return and a line feed (selected in the "Display Set-Up" screen, Chapter 4).

Pressing "Return" normally moves the cursor to the beginning of the next line.

⌫ (Delete) — Pressing the ⌫ key normally sends a DEL (delete) code. Many applications use DEL to delete one character to the left of the cursor.

You can make the <x] key send a BS(backspace) character instead of DEL. You use the "Delete" feature in the "Keyboard Set-Up" screen(Chapter 4).

Space bar — Pressing the space bar sends a SP(space) code. You use spaces to separate words or move the cursor forward.

Thai key — Pressing Thai key sets the keyboard to Thai input mode ("Thai indicator" turns on).
Pressing Thai key again sets the keyboard to English input mode ("Thai indicator" turns off).

In VT52 mode, "Thai" key is not available.

"Ctrl-Thai" sets the terminal to Hexadecimal code input mode.

See "Specific input mode" in this chapter.

3.2.3 Editing Keypad

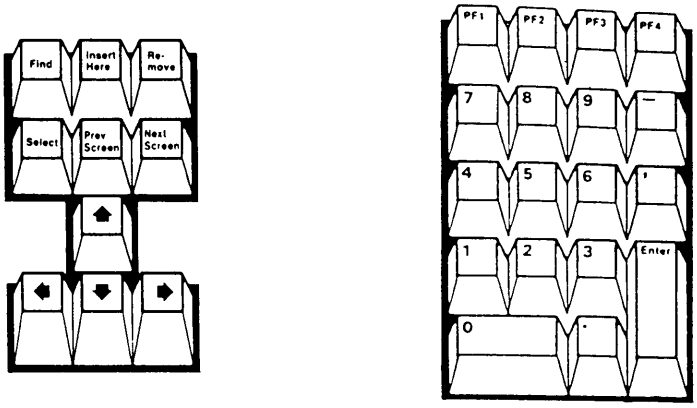


Figure 3-5 Editing Keypad and Numeric Keypad

The editing keypad has four arrow keys and six editing keys(Figure 3-5).

Pressing an arrow key normally moves the cursor in the direction of the arrow.
For example, pressing the (down arrow) key moves the cursor down one line.

You can use the editing keys for special functions defined by application. Application usually determines how to use editing keys. See the application manuals for detail.

The "Cursor Key Mode" in the "Keyboard Set-Up" screen defines the code sent by arrow key.

3.2.4 Numeric Keypad

Figure 3-5 shows the numeric keypad.

The numeric keypad keys often have functions assigned by application. See your application manuals for information.

You can use the numeric keypad to enter numeric data as you would with a calculator, when you set "Numeric Keypad" in the "Keyboard Set-Up" screen.

See Chapter 4 for detail.

3.2.5 Top-Row Function Keys

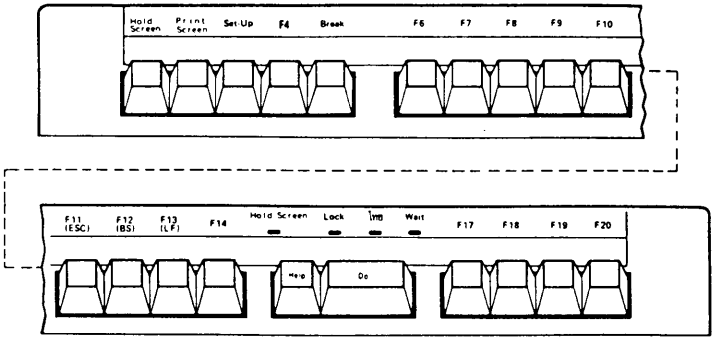


Figure 3-6 Top-Row Function Keys

Most of the top-row keys (Figure 3-6) have functions assigned by application. Your application manuals should describe the function of these keys.

The first five keys on the left of this row have predefined functions. Applications cannot redefine these keys.

Hold Screen — Pressing "Hold Screen" freezes incoming data on the screen, so you can read it. When you freeze the screen, the "Hold Screen" indicator turns on.

Pressing "Hold Screen" again releases the screen, so new data can appear. The indicator turns off.

NOTE: The "Hold Screen" key does not work if you set the "XOFF" feature to "No XOFF" in the "Communications Port Set-Up" screen (Chapter 4).

Print Screen — Pressing "Print Screen" sends the text to the printer. (Text Print)

Pressing "Shift-Print Screen" sends the graphic image

converted from screen image through Sixel mode to the printer. (Sixel Print)
When you use "Shift-Print Screen", it is necessary that the printer is capable to print in Sixel mode.
See Chapter 5.

Pressing "Ctrl-Print Screen" turns auto print mode on or off. In auto print mode, you can automatically print each line of text as it is received from the host system. See "Print Modes" in Chapter 5.

Set-Up — You press "Set-Up" to enter or to leave set-up. When you enter set-up, the terminal displays the "Set-Up Directory" screen. You can leave set-up from any set-up screen. Chapter 4 describes set-up.

F4 — Not used.

Break — "Break" works alone or with other keys to perform a function that affects the communication between the host system and your terminal. Pressing "Break" sends break signal.

You can turn this key on or off with the "Break" feature in the "Keyboard Set-up" screen (Chapter 4).

Pressing "Shift-Break" may end communication with a modem.

Pressing "Ctrl-Break" sends the answerback message to host. See the "Terminal Set-Up" screen in Chapter 4.

NOTE: "Ctrl-Break" sends the answerback message even if you set the "Conceal Answerback Message" feature in the "Terminal Set-Up" screen (Chapter 4).

F6 to F14, Help, Do, and F17 to F20 have functions assigned by application. Your application manuals should describe the function of these keys.

You can use these function keys as User-Defined keys. See "Overview of User- Defined Keys" in this chapter.

In VT100 and VT52 mode, these function keys are not available, except F11 to F13.

F11(ESC) — In VT100 and VT52 mode, F11 sends an ESC (escape) code.

To send an ESC in VT300 mode, you can usually press"Ctrl-3".

F12(BS) In VT100 and VT52 mode, F12 sends an BS (backspace) code. You can also press "Ctrl-H" to send a backspace.

F13(LF) In VT100 and VT52 mode, F11 sends an LF (line feed) code. You can also press "Ctrl-J" to send a line feed.

3.2.6 Indicator Lights

The keyboard has four indicator lights (Figure 3-7).

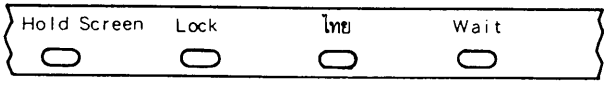


Figure 3-7 Indicator Lights

3.2.6.1 Hold Screen

This indicator turns on when you press the "Hold Screen" key to freeze the screen display. See the "Hold Screen" key description.

3.2.6.2 Lock

This indicator turns on to indicate the terminal is sending only uppercase characters. See the "Lock" key description.

3.2.6.3 Thai

This indicator turns on when the keyboard is in one of the following input modes.

- Thai input mode
- Hexadecimal input mode

This indicator turns off when the keyboard is in English input modes.

3.2.6.4 Wait

This indicator turns on when the keyboard cannot send data. The common term for this condition is a locked keyboard. If the "Wait" indicator stays on for any time, you may need to unlock the keyboard.
You can clear a locked keyboard by using the "Clear Communications" features in the "Set-Up Directory" screen (Chapter 4).

Also, while you print Sixel data, "Wait indicator" will turn on.

3.2.7 KEYBOARD INDICATORS

The keyboard has two audible indicators: a keyclick and bell(margin bell and warning bell). You can enable or disable these indicators in the "General Set-Up" screen (Chapter 4).

3.2.7.1 Keyclick

You hear the keyclick sound each time you press a key, except under the following conditions.

- You press "Shift" or "Ctrl" alone. These keys never make a keyclick sound.
- The "Wait" indicator is on. No keys can make a keyclick sound.
- You disable the "Keyclick set-up" feature.
- You press a key that does not have a function in the current "Terminal Mode" ("Terminal Set-Up" screen). For example, keys F6 through F10 do not work in VT100 mode.

3.2.7.2 Bell

The bell tone is a beeping sound. You can use the bell as a margin bell, warning bell or, both.

The margin bell sounds when the cursor approaches to the right margin.

The warning bell sounds for any of the following conditions.

- During the power-up self-test

- When the terminal receives a bell(BEL) character from the host system
- When an error operation is made in Set-Up
- When an error operation is made in hexadecimal input mode
- When an error operation is made in Thai input mode
- If an "NVR error" message appears at the bottom of the screen

3.3 STATUS LINE

The VT382 uses the 25th line of the screen to display a status line. By default, the status line appears in reverse video at the bottom of the screen. You can change the status line by changing the setting of the "Status Display" feature in the "Display Set-Up" screen. Chapter 4 describes how to change set-up settings.

The "Status Display" feature has three settings. You can select when to display the status line and what type of status line to use.

Indicator(default)	The status line appears at all times. (See Chapter 4).
None	The status line appears when . you select a set-up screen, or . the host system selects the status line.
Host-writable	Applications can write messages on the status line.

The status line provides information about the terminal's current operations. For the example, the status line shows you current printer status.

See Chapter 4 for detail about each information in the status line.

3.4 OVERVIEW OF USER-DEFINED KEYS

The VT382 lets you define the function of 15 keys on the top row of the keyboard, when you set "VT300 Mode" in the "Terminal Set-Up" screen.

F6 through F14
Help

Do
F17 through F20

User-defined keys (UDKs) let you store and recall text and commands that you often use with applications. You should refer to your system documentation for the commands that you can store in user-defined keys.

To define a key's function, you use the "User-Defined Key Set-Up" screen. After you define a UDK, you can use the function key as UDK.

When you select "Shifted" in the "User-Defined Key Set-Up" screen, you can use the UDK by pressing "Shift-(defined key)". For example, if you defined the F6 key, you would press "Shift-F6".

When you select "Unshifted" in the "User-Defined Key Set-Up" screen, you can use the UDK by pressing only "(defined key)". For above example, you would press "F6".

See Chapter 4,"User-Defined Key Set-Up" screen, for detail about UDKs setting.

NOTE

Your host system can also define the top-row function keys.

3.5 SPECIFIC INPUT MODES

The initial state of the VT382 is English input mode. By using Thai Key, you can select some specific input modes.

3.5.1 Thai Input Modes

By pressing Thai key, Thai input mode is available.

For detail of Thai input mode, see Appendix D.

NOTE

In VT52 mode, you can not use Thai input mode.

3.5.2 Hexadecimal Codes Input Mode

Pressing "Ctrl-Thai" in English input mode, makes the terminal into hexadecimal codes input mode and "Thai indicator" turned on. In this mode, you can enter arbitrary hexadecimal codes.
Entering two hexadecimal codes (0 to 9, a to f, or A to F) sends the composed character, and exit hexadecimal codes input mode to English input mode. If you enter "DELETE" key, Hexadecimal codes input mode is aborted, "Thai indicator" turns off, and returns to English input mode.

CHAPTER 4

USING SET-UP

4.1 OVERVIEW

The VT382 has a series of Set-Up screens that list the settings for the terminal's operating features.
You can display these screens and change the settings from the keyboard. This chapter describes Set-Up and how to use it.

Each Set-Up screen lists a particular set of operating features. For example, one screen lists keyboard features, while another lists communication features.

Each set-up feature is initially set to a factory-default setting that works with many Digital systems. The VT382 has the factory-default settings permanently stored. If you change settings, you can recall the factory-default settings in Set-Up.

You can also select and save settings to match your host system. The VT382 saves your selections in nonvolatile memory(NVR), along with the factory-default settings.
When you turn power off, you do not lose your saved settings.

4.2 OPERATION OF SET-UP

4.2.1 How To Enter And Leave Set-UP

To enter set-up, you press the "Set-Up" key. When you press "Set-Up", information on the screen disappears. (This information appears again when you leave set-up. But the Sixel data which was displayed is lost.)
Then the terminal displays the "Set-Up Directory" screen.

The "Set-Up Directory" lists all other set-up screens. You can select any other set-up screen from the "Set-Up Directory".

To leave set-up, you press "Set-Up" again. You can leave set-up from any set-up screen.

NOTE

A part of features change you make in set-up take effect when you leave set-up.

4.2.2 How To Move From Set-Up Screens

There are two ways to move from set-up screens.
You can use "To Next Set-Up" field to move forward from one screen to the next.
You can also select a screen directly from the "Set-Up Directory". If you select other than "Set-Up Directory", you can select "To Directory" field.

4.2.3 How To Save A Current Setting

When you turn on the terminal, the terminal is Set-Up by saved settings.
If you make changes to current settings, you can save your changes with the "Save Parameters" feature in the "Set-Up Directory". This feature saves all current settings in most set-up screens (except "Keypad Mode", "Cursor Key Mode" etc.).

4.2.4 How To Recall Saved Settings

For some applications, you may want to make temporary changes to current settings.
When you are finished using the temporary settings, you can recall your saved settings with the "Recall Parameter" feature in the "Set-Up Directory". This feature does not affect the features which can't be saved.

NOTE

If you use a modem, "Recall Saved Settings" may disconnect communication with the host system.

4.2.5 Keys Used In Set-Up

Table 4-1 lists keys mainly used in Set-Up.

Table 4-1 Keys Used in Set-Up

Key	Function
Set-Up	Press "Set-Up", the VT382 enters Set-Up. Press "Set-Up" again, the VT382 leaves Set-Up.
Arrow keys	Use arrow keys to move field cursor. In text parameter field, up or down arrow key aborts to input parameter.
Enter	In action field, pressing "Enter" performs the action. In parameter field, pressing "Enter" changes the parameter setting. In text parameter field, pressing "Enter" changes the status line to text input line. After entering text, press "Enter" again to finish entering.

4.3 SET-UP SCREEN

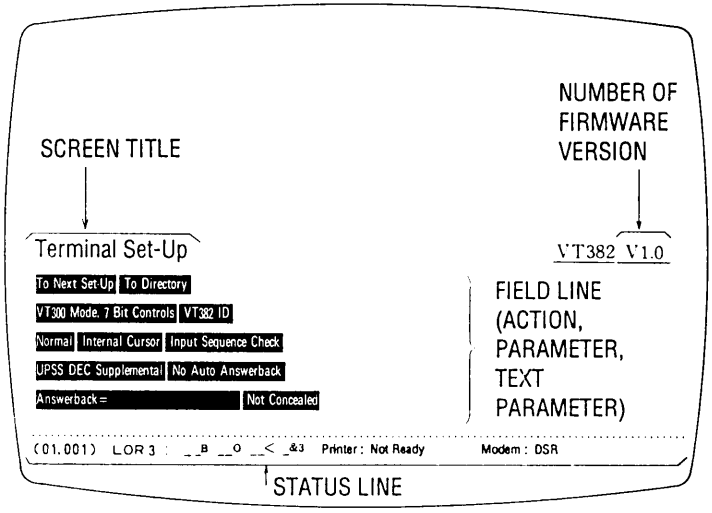


Figure 4-1 Set-Up Screen

The Set-Up screens include information as follows.

- Screen title
- Number of firmware version
- Status line
- Fields which indicate features

NOTE

The set-up screens in this chapter show the factory-default settings.

4.3.1 Screen Title

The screen title shows you the set-up screen name.

4.3.2 Number Of Firmware Version

The number of firmware version indicates the level of the firmware.

4.3.3 Status Line

The VT382 uses the 25th line to display a status line.
You can select when to display the status line. By default, the status line appears at all times. The status line always appears in set-up.

The status line has four fields. Each field displays the status of a particular VT382 feature, such as printer status.
Table 4-2 describes each field.

When you select a host-writable status line, applications on your host system can use the status line to send you messages.

Table 4-2 Status line Fields

Field	Value	Indicates
Cursor Position	(rr, ccc)	Current cursor position. rr: row ccc: column (as ASCII character)
LmRn	Character sets. m: mapped character set into GL. n: mapped character set into GR.	
	Following : indicating character sets designated as G0 to G3.	
	_B	ASCII
	_&3	Thai
	_0	DEC Special Graphics
	_>	DEC Technical
	_<	User-Preference Supplemental Set
	_%5	DEC Supplemental
	_A	ISO Latin-1 Supplemental
	???	User-Defined Character Set *1
Printer		Printer status
	Printer:Ready	The printer can receive data for printing (on-line).
	Printer:Not Ready	The printer is not ready to receive data for printing (off-line).
	Printer:None	The printer is off or not connected to the VT382.
	Printer:Auto Print	The VT382 is in auto print mode. The terminal sends the current display line to the printer when the cursor moves to the next line. See Chapter 5.
	Printer:Controller	The VT382 is in printer controller mode. See Chapter 5.

Table 4-2 Status line Fields (cont)

Field	Value	Indicates
Modem		Modem status *2
	Modem:DSR	The modem is ready to send or receive data. The modem sends the data set ready(DSR) signal to indicate the modem is ready.
	Modem:No DSR	The modem is not ready to send or receive data from the terminal.

*1 ??? is defined by user.
*2 "Modem" is blank, unless the "Modem Control" feature in the "Communications Port Set-Up" screen set to "Modem Control".

4.3.4 Fields

4.3.4.1 Set-Up Cursor

Set-Up uses a special cursor that highlights a screen entry, or field, in reverse video. When you enter set-up, the cursor highlights the "Terminal Set-Up" field in the "Set-Up Directory".

You use the arrow keys to move the cursor to different features.

4.3.4.2 Action Fields

When you select an action field, the terminal immediately performs that action. You press the "Enter" key to select the action field highlighted by the cursor. Most set-up screens have some action fields.

Some actions do no affect the screen, so the VT382 displays a message to let you know if the action was successful. This message appears in place of the status line at the bottom of the screen.

- A "Done" message indicates the action is complete.
- An "NVR error" message indicates the terminal could not perform the action.

How to Select an Action Field - The following example shows you how to select the "Display Set-Up" screen from the "Set-Up Directory".

1. Press "Set-Up". The terminal displays the "Set-Up Directory".

2. Press the right arrow key. The cursor advances to the "Display Set-Up" action field.

3. Press "Enter". The terminal displays the "Display Set-Up" screen.

4.3.4.3 Parameter Field

There are some parameter fields, which have several parameter of setting, in each Set-Up screen.

You use the arrow keys to move the cursor to parameter field, and press "Enter" key to change setting. The setting of parameter field cycles by pressing "Enter" key.

For example, suppose you want to change the current setting for the "80/132 Columns" in the "Display Set-Up Screen", from "80 columns" to "132 Columns" . This feature determines display width on the screen.

1. Press "Set-Up". The terminal displays the "Set-Up Directory".

2. Press right arrow key one time, and "Enter" keys.
   The terminal displays the "Display Set-Up" screen.

3. Use the arrow key to move the cursor toward "80 Columns".

4. Press "Enter" key one time. The current setting changes to "132 Columns".

5. Press "Set-Up" to leave set-up.

4.3.4.4 Text Parameter Field

There are another field called text parameter field.
Text parameter field includes text data.
VT382 has two text parameter fields, "Answerback" and "F6-F20" which defines UDK.
See each field's explanation, how to set text data.

4.4 A GUIDE OF SET-UP FEATURES

Table 4-4 lists all the VT382 set-up screens and their features. This chapter describes all set-up screens, listed on the first page of the table.

Table 4-4 A Guide to Set-Up Features

[[Set-Up Directory]]	[[Terminal Set-Up]]	[[Display Set-Up]]
Terminal Set-Up	To Next Set-Up	To Next Set-Up
Display Set-Up	To Directory	To Directory
Keyboard Set-Up	Terminal Mode	80/132 Columns
Tab Set-Up	Terminal ID	Smooth/Jump Scroll
UDK Set-Up	User-Preference	Light/Dark Display
General Set-Up	Supplemental Set	Cursor Enable
Comm Port Set-Up	Space Compensation	Cursor Blink Enable
Printer Set-Up	Physical/Internal Cursor	Cursor Style
Save Parameter	Input Sequence Check	Auto Wrap
Recall Parameter	Auto Answerback	New Line
Factory Default	Conceal Answerback	Control
Clear Display	Answerback	Representation Mode
Clear Comm Port		Status Display
Reset Terminal		Sixel Scrolling
On-Line/Local		
Exit Set-Up		
[[Keyboard Set-Up]]	[[Tab Set-Up]]	[[UDK Set-Up]]
To Next Set-Up	To Next Set-Up	To Next Set-Up
To Directory	To Directory	To Directory
Break	Clear All Tabs	UDK Lock
Caps/Shift-Lock	Set 8 Column Tabs	UDK Shifted
Keypad Mode	Tab Fields and Ruler	UDK Concealed
Cursor Keys Mode		Bytes Free
Back arrow Key		Save UDK
Keyboard Layout		Recall UDK
		F6-F20

Table 4-4 A Guide to Set-Up Features (cont)

[[General Set-Up]]	[[Communications Port Set-Up]]	[[Printer Set-Up]]
To Next Set-Up	To Next Set-Up	To Next Set-Up
To Directory	To Directory	To Directory
Keyboard Language	Transmit Speed	Transmit/Receive Speed
User Features Lock	Receive Speed	Data Bits/Parity
CRT Saver Enable	X-Off	Stop Bits
Auto Repeat	Data Bits/Parity	Print Mode
Keyclick	Stop Bits	Print Extent
Margin Bell	Local Echo	Screen Size
Warning Bell	Host Port Selection	Printed Data
Keyclick Volume	Disconnect Delay	Print Terminator
Bell Volume	Transmit Rate Limit	Printer to Host
		XOFF
		Sixel Graphics Level
		Sixel Print Option

4.5 SET-UP DIRECTORY

Fig 4-2 Set-Up Directory

Table 4-5 describes all the fields on the Set-Up Directory screen.

Table 4-5 Set-Up Directory Fields

Field	Function
Terminal Display Keyboard Tab UDK General Communications Port Printer	These fields display the selected Set-Up screen.
Save	Saves all current settings in most Set-Up screens. The current settings become the saved settings.

NOTE : "Keypad Mode", "Cursor Key Mode" and features can't be saved.

Table 4-5 Set-Up Directory Fields (cont)

Field	Function
Recall	Replaces all current settings in most Set-Up screens with the saved settings. This feature also clears the screen.
NOTE : "Keypad Mode" and "Cursor Key Mode" features can't be recalled. If you use a modem or other communication equipment, "Recall" or "Factory Default" may disconnect communication with the host.	
Default	Replaces all current settings in all Set-Up screens with the default settings.
Clear Display	Clears the screen (including the host-writable status line) when you leave Set-Up.
Clear Communications Port	Clears communications as follows. . Cancels sending data to printer port, and printer stops after print data in the buffer. . Cancels any escape sequence, control sequence, or device control string (DCS). . Clears the keyboard buffers. . Clears the receive buffer. . Clears the transmit buffer. . Exit from "Printer Controller Mode". . Sends an XON signal to the host. . Resets the XOFF receive flags at the printer and host. . Resets the DSR receive flags at printer. . Unlock the keyboard lock status.
NOTE: "Clear Comm Port" does not disconnect communication with the host system.	

Table 4-5 Set-Up Directory Fields (cont)

Field	Function
Reset Terminal	Resets many set-up features to their default settings. Resets internal features to default settings that work with many applications. See Appendix C "Resetting and Testing". Thai input operation in progress is aborted. "Reset Terminal" doesn't affect following features. . User-Defined Key . Soft Character Set . Screen display width . Scrolling . Screen mode . Auto repeat . Caps/Shift-Lock mode . Tab stop . Keyclick . Control representation mode . Status line
On-Line/Local	Selects whether or not the VT382 can communicate with a host system.
o On Line	Lets the VT382 communicate with a host.
Local	Effectively puts the host on hold. The characters you type go directly to the screen.
Exit	Set the terminal in current setting, and exit Set-Up.

======= Default settings are with "o" =======

4.6 TERMINAL SET-UP

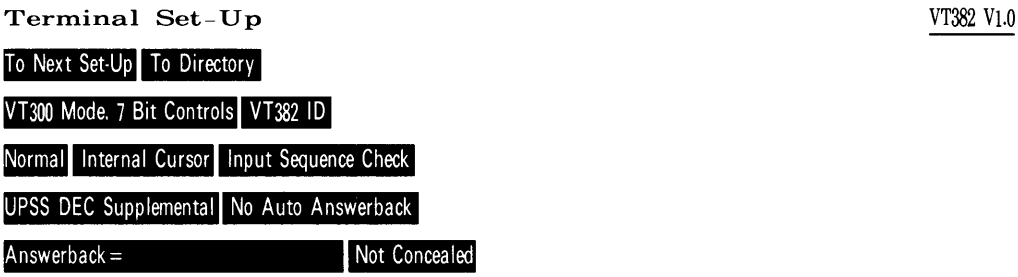


Figure 4-3 "Terminal Set-Up" screen

This screen lets you set fundamental terminal features, such as "Terminal Mode".

Table 4-6 describes the "Terminal Set-Up" screen

Field	Function
To Next Set-Up	Forward Set-Up screen. ("Display Set-Up"screen)
To Directory	Return to "Set-Up Directory" screen.
Terminal Mode	Selects the terminal's operating mode. The VT382 can emulate any VT series terminal.
VT52 Mode	Lets the terminal run VT52 applications. You can not use the VT382 as Thai Terminal.

Table 4-6 describes the "Terminal Set-Up" screen (cont)

Field	Function
	VT100 Mode Lets the terminal run VT100 applications.
	o VT300 Mode Lets the terminal use all VT382 features.
	7 Bit Controls The terminal uses 7-bit controls and 8-bit graphic characters. Use this mode for VT200 applications. This is the recommended mode for most applications.
	VT300 Mode Lets the terminal use all VT382 features.
	8 Bit Controls The terminal uses 8-bit controls and 8-bit characters. Use this mode for VT200 applications that use 8-bit control characters. Many VT100 applications will work in VT382-8bit mode. This mode is the most efficient, but not yet supported by many applications.
Terminal ID	Selects the device attributes response, also called the terminal ID.
NOTE: You can't select this feature when "Terminal Mode" is "VT52 Mode".	
	VT100 ID
	VT101 ID
	VT102 ID
	VT220 ID
	VT320 ID
	o VT382 ID
User-Preference Supplement Set	Selects supplement character set to use, DEC supplement set or ISO Latin-1 supplement set.
	o UPSS DEC Supplement
	UPSS ISO Latin-1

Table 4-6 describes the "Terminal Set-Up" screen (cont)

Field	Function
Space Compensating Mode	Select Thai application specific features or normal operating features.
o Normal Space Compensation	
Thai Cursor Mode	Select cursor operating mode.
Physical Cursor o Internal Cursor	
Thai Input Sequence Mode	Select whether or not the VT382 can check Thai input sequence.
o Input Sequence Check No Input Sequence Check	
Auto Answerback	Selects whether or not to send the answerback message to the host, after a communication line connection.
o No Auto Answerback	Does not send the answerback message to the host.
Auto Answerback	Automatically sends the answerback message to the host.
Answerback	Lets you type an answer back message. You can use up to 30 characters. The VT382 sends the answerback message when you press "Ctrl-Break", or when the host system sends an ENQ character.
Conceal Answerback	Selects whether or not the VT382 can display the answerback message.
o Not Concealed	The VT382 can display the answerback message in set-up.

Concealed	The VT382 does not display the answerback message in set-up.

NOTE: When you press "Ctrl-Break", the VT382 sends the answerback message. After concealing a message, you can change the concealed setting by entering a new message in the Answerback Message text field.

═══ Default settings are with "o" ═══

4.6.1 Entering An Answerback Message

You can enter an answerback message as follows.

1. Select the "Terminal Set-Up" screen.
2. Use the arrow keys to move the cursor to "Answerback Message":
3. Press "Enter" key. The status line changes to input line.
4. Type your message, up to 30 characters long.
   For example, you might type "VT100". If you make a mistake, you can correct it by using the <x]key, left or right arrow key.
   You can abort to input by using up or down arrow key.
5. To finish entering, press "Enter" key.

You can send the answerback message by pressing "Ctrl-Break". The VT382 must have a communication connection to the host system. When you press "Ctrl-Break", the terminal sends the message.

4.7 DISPLAY SET-UP

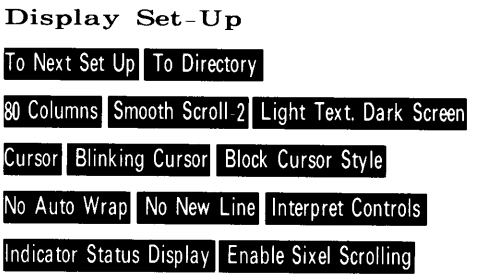


Figure 4-4 Display Set-Up Screen

This screen (Figure 4-4) has features that affect the way data appears on the screen. Table 4-7 describes the "Display Set-Up" features.

Table 4-7 Display Set-Up Features

Field	Function
To Next Set-Up	Forward Set-Up screen. ("Keyboard Set-Up"screen)
To Directory	Return to "Set-Up Directory" screen.
80/132 Columns	Selects an 80- or 132-column screen width for text. o 80 Columns 80 characters per line. 132 Columns 132 characters per line.
Jump/Smooth Scroll	Selects how fast line appear on screen when you scroll.

Table 4-7 Display Set-Up Features (cont)

Field	Function
	Smooth Scroll-1 Lines scroll at slow speed. o Smooth Scroll-2 Lines scroll at middle speed. Smooth Scroll-3 Lines scroll at high speed. Jump Scroll Lines scroll as fast as the terminal receives them.
Light/Dark Display	Selects light text on dark background, or dark text on light background.
	Dark Text, Light Screen Selects light background and dark text. o Light Text, Dark Screen Selects dark background and light text.
Cursor Enable	Selects whether or not to display the cursor.
	o Cursor Displays a block or underline cursor. No Cursor Does not display the text cursor.
Cursor Blink Enable	Selects whether the cursor blinks(flashes).
	o Blinking Cursor The cursor blinks. No Blinking Cursor The cursor does not blink.
Cursor Style	Selects a block or underline cursor.
	o Block Cursor Style Selects a block cursor. Underline Cursor Style Selects an underline cursor.
Auto Wrap	Selects whether or no text characters automatically wrap to the next line when you reach the right margin.
	Auto Wrap When you reach the margin, the VT382 displays new characters on the next line. o No Auto Wrap When you reach the margin, the VT382 displays each new character in the last column of the line. Each new character overwrites the previous character at that position.

Table 4-7 Display Set-Up Features

Field	Function
New Line	Selects how the "Return" key works.
o No New Line	Pressing "Return" sends a carriage return character. The VT382 does not move the cursor to a new line.
New Line	Pressing "Return" sends a carriage return and a line feed. Used for some non-Digital applications.
Control Representation Mode	Selects whether the terminal displays or processes control characters. You can use this feature as an aid for debugging programs. See "Display Controls Mode" in the "VT382 Programmer Reference Manual".
o Interpret Controls	The VT382 processes control characters, but does not display them.
Display Controls	The VT382 displays most control characters without processing them.
Status Display	Selects how and when to use the status line (the 25th line).
NOTE: The terminal always displays the indicator status line in set-up.	
No Status Display	The VT382 cannot display a status line outside of set-up.
o Indicator Status Display	The VT382 displays a status line for the active session, at all times.
Host Writable Status Display	The host can display information on the status line.
Sixel Scrolling	Selects whether or not to scroll Sixel image.
o Enable Sixel Scrolling	Scrolls Sixel image.
Disable Sixel Scrolling	Does not scroll Sixel image.

======= Default settings are with "o" =======

4.8 KEYBOARD SET-UP

Figure 4-5 Keyboard Set-Up Screen

This screen (Figure 4-5) lets you control keyboard features such as keyclick, margin bell, and Thai key. Table 4-8 describes the "Keyboard Set-Up" features.

Table 4-8 Keyboard Set-Up Features

Field	Function
To Next Set-Up	Forward Set-Up screen. ("Tab Set-Up"screen)
To Directory	Return to "Set-Up Directory" screen.
Break	Selects whether or not the "Break" key sends a break signal. See the "Break" key description in Chapter 3.
o Break	The Break key sends a break signal.

Table 4-8 Keyboard Set-Up Features (cont)

Field	Function	
	No Break	The Break key does not work alone. But you can still use the "Shift-Break" and "Ctrl-Break" functions. See the "Break" key description in Chapter 3.
Caps/Shift-Lock	Selects the function of the Lock key.	
	o Caps Lock	Alphabetic keys send their uppercase character. Other keys still send the bottom character on their keycap.
	Shift Lock	Alphabetic keys send their uppercase character. Other keys send the top character on their keycap.
Keypad Mode	Selects the type of characters sent by the numeric keypad.	
NOTE: The setting is not saved in nonvolatile memory.		
	o Numeric Keypad	The keypad except PF1 to PF4 sends the ASCII code for the numbers shown on the keycaps.
	Application Keypad	The keypad sends control sequences (used with some applications).
Cursor Keys Mode	Selects whether the arrow keys send ANSI cursor control sequences or application-specific control functions.	
NOTE: The setting is not saved in nonvolatile memory.		
	o Normal Cursor Keys	Arrow keys send standard ANSI cursor control sequences.
	Application Cursor Keys	Arrow keys send application-specific control functions.

Table 4-8 Keyboard Set-Up Features (cont)

Field	Function
Backarrow Key	Selects the character sent to the host system when you press the <x] key. o <x] Delete — Sends DEL (delete) code. <x] Backspace — Sends BS (backspace) code.
Keyboard Layout	Change a part of main keypad function, in order that the the VT382 keyboard layout matches to VT100. o VT300 Layout VT100 Layout When "VT100 Layout" is set, following keypads change their functions. . [,,] -> [,<] . [..] -> [.>] . [<>] -> [`~] . [`~] -> ESC

======= Default settings are with "o" =======

4.9 TAB SET-UP SCREEN

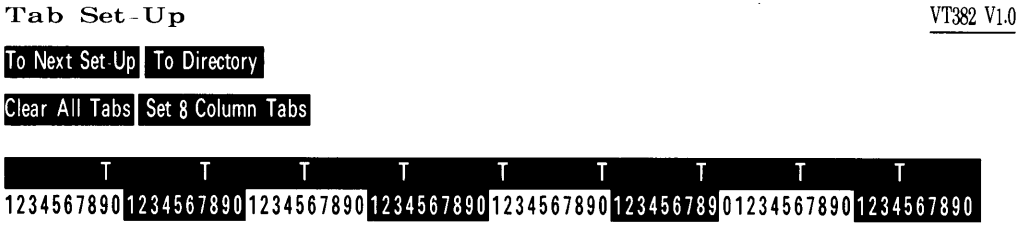


Figure 4-6 Tab Set-Up Screen

This screen (Figure 4-6) lets you set the number of tab stops on a line. Tab stops on the screen are similar to tab stops on a typewriter. When you press the "Tab" key outside of set-up, the cursor advances to the next tab stop. Table 4-9 describes the five action fields on this screen.

There is one tab stop field for each column on the screen. You can use a screen display of 80 or 132 columns per line. See the "Display Set-Up" screen.

There are two possible settings for each tab stop field: the letter T(tab stop) or a blank (no tab stop).

You can move the cursor to a tab stop field with the arrow keys or the Tab key.
After you select a field, press Enter to place a T in a blank field or erase a T from that field.

NOTE

You cannot put a tab in column 1.

Table 4-9 Tab Set-Up Features

Field	Function
To Next Set-Up	Forward Set-Up screen. ("User-Defined Key Set-Up" screen)
To Directory	Return to "Set-Up Directory" screen.
Clear All Tabs	Removes all current tab settings shown on the Tab Set-Up screen.
Set 8 Column Tabs	Sets one tab every eight columns, starting at column 9.
Tab Fields and Ruler	Set each tab stop field.

4.10 USER-DEFINED KEY SET-UP

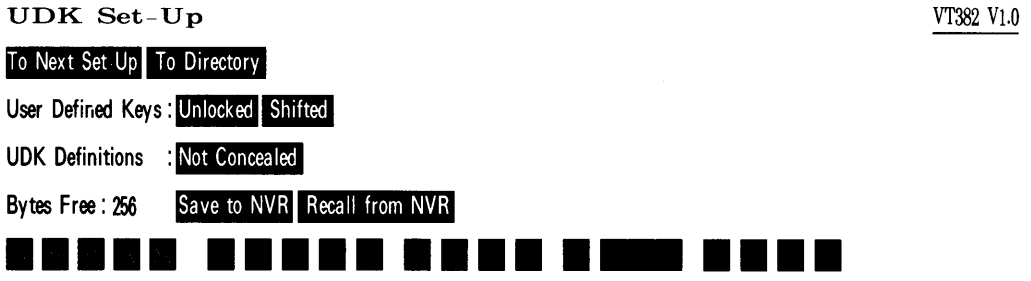


Figure 4-7 User-Defined Key Set-Up Screen

Figure 4-7 shows the "User-Defined Key Set-Up" screen. Table 4-10 describes the features on this screen. To select a feature, you move the cursor to that field and press "Enter". The terminal immediately performs the action.

The screen also has a diagram of the 20 top-row function keys, F1 through F20.
A box represents each key. You cannot define keys F1 through F5, so the diagram has "><" in box for those keys.

You can also save, recall, and protect your UDKs in this screen.

Table 4-10 User-Defined Key Set-Up Features

Field	Function
To Next Set-Up	Forward Set-Up screen. ("General Set-Up"screen)
To Directory	Return to "Set-Up Directory" screen.
UDK Lock	Selects whether or not the host can change "User-Defined Keys" .
o Unlocked	Lets the host change UDK definitions.
Locked	Does not let the host change UDK definitions.
UDK Shifted	Selects whether Shifted-UDK or Unshifted-UDK.
o Shifted	"Shift-(function key)" is used as UDK. "(function key)" sends the built-in sequence.
Unshifted	"(function key)" is used as UDK. "Shift-(function key)" sends the built-in sequence.
UDK Concealed	Selects whether or not the VT382 can display UDK definitions in Set-Up.
o Not Concealed	The VT382 can display UDK definitions in Set-up.
Concealed	The VT382 does not display the UDK definitions in Set-up.

NOTE: After concealing, you can change the concealed setting by entering a new definitions in the UDK text field.

Bytes Free	Display free bytes to define UDK.
Save to UDK	Saves the definitions of UDKs in nonvolatile memory. You can turn the terminal off, without losing your definitions.

Recall from UDK	Recalls any saved UDK definitions from nonvolatile memory.
F1-F20 Fields	Text parameter field for definition of UDKs

======= Default settings are with "o" =======

4.10.1 How To Define And Use UDK

1. Press "Set-Up" to enter set-up. The "Set-Up Directory" appears.

2. Use the arrow keys to move the cursor to the "User-Defined Key Set-Up" field.

3. Press "Enter". The "User-Defined Key Set-Up" screen appears.

4. Use the arrow keys to move the cursor to the box that represents the key you want to define. When you move the cursor to a key, the number of the key appears on the status line of the screen.

5. Press "Enter". The status line changes to input line, and the UDK's definition clears. If you want to recall the definition, press "Shift-(the defined key)".

6. Enter the definition for the key, you can enter commands, control characters, or text recognized by your application.

   If you make a mistake, you can edit your definition by using <x]key, or left or right arrow key.

   If you cancel definition, press up or down arrow key.

   When you finish entering, press "Enter".

7. Press "Set-Up" to leave set-up. You must leave set-up before you can use the function key you defined.

8. When you select "UDK Shifted" in the "User-Defined Key Set-Up" screen, "Shift-(the defined key)" sends the defined sequence. When you select "UDK Unshifted", "(the defined key)" without holding "Shift" key sends the defined sequence.

4.10.2 Tips On Using UDKs

Here are some general guidelines you should keep in mind when using UDKs.

- Save the definitions you want to use again. If the terminal loses power, you lose any UDK definitions that are not saved.

- Remember, you can only use up to 256 characters for UDK definitions.

- You can only use UDKs in VT300 mode. You cannot use UDKs if the terminal is emulating another type of terminal(that is, if the Terminal Mode feature in the "Terminal Set-Up" screen is set to a VT100, VT52 mode, then UDKs can't be used).

- You can enter control characters as part of a UDK definition. Programmers can use UDKs to store control sequences.

4.11 GENERAL SET-UP SCREEN

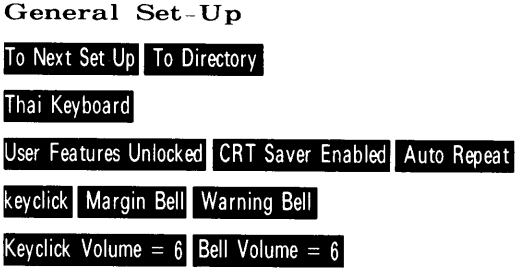


Figure 4-8 General Set-Up Screen

This screen (Figure 4-8) has general features of terminal.
Table 4-11 describes each feature on the "General Set-Up" screen.

Table 4-11 General Set-Up Features

Field	Function
To Next Set-Up	Forward Set-Up screen. ("Communications Port Set-Up" screen)
To Directory	Return to "Set-Up Directory" screen.
Keyboard Language	Display as follows, " Thai Keyboard" The setting can't change.
User Features Lock	Selects whether or not the host system can change certain set-up features that users often set to their own preference:

Table 4-11 General Set-Up Features (cont)

Field	Function	
		Scrolling Display Background Auto Repeat Tab Stop Keyboard Lock
	o User Features Unlocked	Lets the host change user preference features.
	User Features Locked	Does not let the host change the user preference features.
CRT Saver Enable	Selects whether or not to use CRT Saver function. The function is used to increase CRT life.	
	o CRT Saver Enabled	If the terminal is left on but inactive for 30 minutes, the screen goes blank. You can press any key to reactivate the screen. The host can also reactivate the screen by sending any character.
	CRT Saver Disabled	CRT saver feature is off.
Auto Repeat	Selects whether or not a key automatically repeats its character when you hold a key down.	
	o Auto Repeat	Holding down a key sends the character repeatedly, until you release the key, Takes effect in set-up.
	No Auto Repeat	Holding down a key sends only one a character.
Keyclick	Selects whether or not the VT382 makes a keyclick when you press keys.	
	o Keyclick	Makes a keyclick.
	No Keyclick	Does not make a keyclick.

Table 4-11 General Set-Up Features (cont)

Field	Function
Margin Bell	Selects whether or not the VT382 makes a bell tone when the cursor approaches the right margin. o Margin Bell — Makes a margin bell. No Margin Bell — Does not make a margin bell.
Warning Bell	Selects whether or not the warning bell sounds. See "Bell" in Chapter 3. o Warning Bell — Makes a warning bell. No Warning Bell — Does not make a warning bell.
Keyclick Volume	Selects the volume of keyclick. The volume number larger, the VT382 sounds louder. Keyclick Volume = 1 Keyclick Volume = 2 Keyclick Volume = 3 Keyclick Volume = 4 Keyclick Volume = 5 o Keyclick Volume = 6 Keyclick Volume = 7 Keyclick Volume = 8
Bell Volume	Selects the volume of bell. The volume number larger, the VT382 sounds louder. Bell Volume = 1 Bell Volume = 2 Bell Volume = 3 Bell Volume = 4 Bell Volume = 5 o Bell Volume = 6 Bell Volume = 7 Bell Volume = 8

======= Default settings are with "o" =======

4.12 COMMUNICATIONS PORT SET-UP

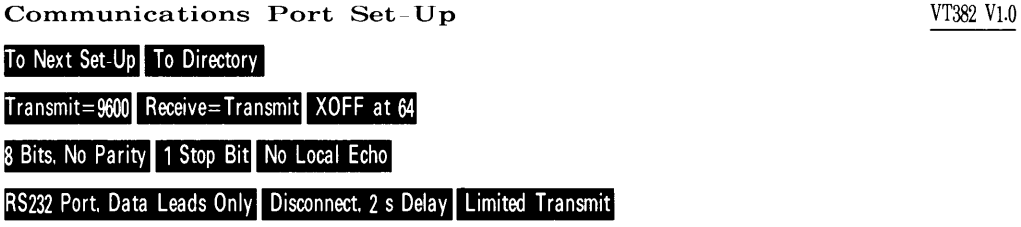


Figure 4-9 Communications Port Set-Up Screen

This screen (Figure 4-9) has features the VT382 uses to communicate with your computer system. The default settings work with most of Digital's computer systems. Make sure the settings you use match the settings for your system.

This screen also includes features for use with modems. Chapter 6 has more information on modems.

NOTE

Communications Port Set-Up features do not affect the printer port.

Table 4-12 describes the "Communications Port Set-Up" features. For more information, see "VT382 Programmer Reference Manual".

Table 4-12 Communications Port Set-Up Features

Field	Function
To Next Set-Up	Forward Set-Up screen. ("Printer Set-Up"screen)
To Directory	Return to "Set-Up Directory" screen.
Transmit Speed	Selects the baud rate the VT382 uses to send data to the host system.

NOTE: The terminal's transmit speed must match the host's receive speed. However, the VT382 can transmit at one speed and receive at another.

- Transmit = 75
- Transmit = 110
- Transmit = 150
- Transmit = 300
- Transmit = 600
- Transmit = 1200
- Transmit = 2400
- Transmit = 4800
- o Transmit = 9600
- Transmit = 19200

Receive Speed	Selects the baud rate the VT382 uses to receive data from the host system.

NOTE: The terminal's receive speed must match the host's transmit speed. However, the VT382 can receive at one speed and transmit at another.

- o Receive=Transmit
- Receive = 75
- Receive = 110
- Receive = 150
- Receive = 300
- Receive = 600
- Receive = 1200
- Receive = 2400
- Receive = 4800
- Receive = 9600
- Receive = 19200

Table 4-12 Communications Port Set-Up Features (cont)

Field	Function
XOFF	Selects the number of characters the VT382 can store in its input buffer before sending the XOFF code. See Chapter 6.
	o XOFF at 64 XOFF at 256 XOFF at 512 No XOFF — Turns XON/XOFF protocol off.
Data Bits/Parity	Selects the character format used to communicate with the host system. See the VT382 Programmer Reference Manual.
	7 Bits, No Parity 7 Bits, Even Parity 7 Bits, Odd, Parity 7 Bits, Mark Parity 7 Bits, Space Parity o 8 Bits, No Parity 8 Bits, Even Parity 8 Bits, Odd Parity 8 Bits, Even Parity, No Check 8 Bits, Odd parity, No Check 7 Bits, Even Parity, No Check 7 Bits, Odd Parity, No Check
Stop Bits	Selects the number of stop bits used in the character format.
	o 1 Stop Bit 2 Stop Bits
Local Echo	Selects whether or not to send the characters you type directly to your host system.
	o No Local Echo — Sends keyboard data to the host system. The host decides whether or not to send the data back to the terminal and display.

Table 4-12 Communications Port Set-Up Features

Field	Function	
Local Echo	Sends keyboard data to the host, and display.	
Host Port Selection	Selects which host communication port is enabled.	
NOTE: There are two host ports. You must set this feature to match the connector you are using.		
o RS232 Port, Data Leads Only	Use RS232, no modem controls.	
RS232 Port, Modem Control	Use RS232, modem controls.	
DEC423 Port, Data Leads Only	Use DEC423, no modem controls.	
DEC423 Port, Modem Control	Use DEC423, modem controls.	
Disconnect Delay	Selects the time allowed for the VT382 to disconnect from a communication line. The VT382 disconnects when it no longer detects the receive line signal detection (RLSD) signal. See The VT382 Programmer Reference Manual.	
NOTE: This setting is effective, only when "Modem Control" is selected.		
o Disconnect, 2 s Delay	Selects a 2 second delay (used in all countries except the United Kingdom).	
Disconnect, 60 ms Delay	Selects a 60 millisecond delay (used in the United Kingdom).	
Transmit Rate Limit	Selects whether or not to limit the number of characters per second that the VT382 sends. A limited rate reduces the burden on the host system.	
o Limited Transmit	Limits the terminal to sending 150 to 180 characters per second.	
Unlimited Transmit	Does not limit the transmit rate.	
═══ Default settings are with "o" ═══		

4.13 PRINTER SET-UP SCREEN

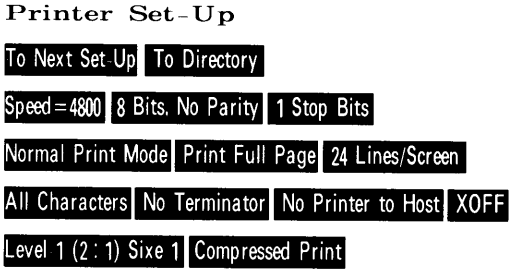


Figure 4-10 Printer Set-Up Screen

This screen (Figure 4-10) lets you select feature to match those of your printer. Table 4-13 describes the features on the "Printer Set-Up" screen.

If you enter set-up while printing, the VT382 temporarily suspends print operations. When you leave set-up, the printer resumes print operations.

Table 4-13 Printer Set-Up Features

Field	Function
To Next Set-Up	Forward Set-Up screen. ("Terminal Set-Up"screen)
To Directory	Return to "Set-Up Directory" screen.
Transmit/Receive Speed	Selects the baud rate the VT382 uses to send and receive data from a printer.

NOTE: You must set the terminal's baud rate to match the printer's baud rate.

Table 4-13 Printer Set-Up Features (cont)

Field	Function
	Speed = 75 Speed = 110 Speed = 150 Speed = 300 Speed = 600 Speed = 1200 Speed = 2400 o Speed = 4800 Speed = 9600 Speed = 19200
Data Bits/Parity	Selects a character format for sending data to the printer.
NOTE: You must set the terminal's data format to match the printer's.	
	7 Bits, No Parity 7 Bits, Even Parity 7 Bits, Odd Parity 7 Bits, Mark Parity 7 Bits, Space Parity o 8 Bits, No Parity 8 Bits, Even Parity 8 Bits, Odd Parity
Stop Bits	Selects the number of stop bits used by the printer port.
NOTE: The terminal must use the same number of stop bits as the printer.	
	o 1 Stop Bit 2 Stop Bits
Print Mode	Determines when and how printing takes place. See Chapter 5.
	o Normal Print Mode — Prints the current page, when you press "Print Screen" or "Shift-Print Screen".

Table 4-13 Printer Set-Up Features (cont)

Field		Function
	Auto Print Mode	Prints the current text line when the VT382 receives a line feed, form feed, vertical tab, or autowrap from the host.
	Controller Mode	Lets the system send data to the printer without displaying the data on the screen.
Print Extent		Selects the area of screen to send to the printer for printing operations.
	o Print Full Page	Selects the full current screen.
	Print Scroll Region	Selects the scrolling region. The scrolling region is the area inside the scrolling margins.
Screen Size		Selects to print whether 24 lines or 26 lines of the screen.
NOTE: This feature is enabled only when "Print Full Page" is selected.		
	o 24 Lines/Screen 25 Lines/Screen	
Printed Data		Lets you select character on the screen to printer sets to match the character sets in the printer.
	o All Characters	All characters are sent to the printer.
	ASCII/Line Drawing/Thai	ASCII, DEC Special Graphics (VT100 line drawing), and Thai characters are sent to the printer.
	ASCII Only	Only ASCII characters are sent to the printer.
	ASCII/Thai in level	Thai characters are sent to the printer by level sequences. See Appendix D

Table 4-13 Printer Set-Up Features (cont)

Field	Function
Print Terminator	Selects whether or not to send a form feed character at the end of a print page operation.
o No Terminator	Does not send a form feed.
Terminator = FF	Sends a form feed after each page prints.
Printer to Host	Selects whether or not the printer port can send information to the host system.
o No Printer to Host	The printer cannot send information.
Printer to Host	The printer can send information.
XOFF	Selects whether or not make data flow control for the printer port.
o XOFF	
No XOFF	
Sixel Graphics Level	Determines how the VT382 matches the printer's sixel aspect ratio and horizontal grid size. For more information, see the "VT382 Programmer Reference Manual".
o Level-1 (2:1) Sixel	Selects a 2:1 sixel aspect ratio. Example: LA50, LA100/LA210
Level-1 (1:1) Sixel	Selects a 1:1 Sixel aspect ratio.
Level-2 Sixel	Selects a 1:1 sixel aspect ratio with a variable grid size. Example: LA75, LN03
Sixel Print Option	Selects the size of the graphic image which the VT382 sends to the printer.
o Compressed Print	
Expanded Print	
Rotated Print	

CHAPTER 5

PRINTERS AND MODEMS

You can connect a printer directly to your VT382. This chapter describes the types of printers you can use. The chapter also describes how to use a modem with the terminal.

5.1 PRINTER

5.1.1 PRINTERS

The following printers can be connected to the printer port:

- LA50
- LA75
- LA100
- LA210
- LN03

These printers do not have Thai capability.

5.1.2 SELECTING A PRINT MODE

The VT382 lets you select from four different print modes. These modes control what you can print. To select a print mode, you use the "Print Mode" feature in the "Printer Set-Up screen". See Chapter 4.

- Normal (default)

- Auto print

- Printer controller
- Local controller

The status line (Chapter 3) displays the current print mode setting, except for local controller mode.

5.1.2.1 Normal Mode: Printing Pages Of Text

The factory-default setting for "Print Mode" in the "Printer Set-Up" screen is "Normal". In this mode, you can use the "Print Screen" key to send text to the printer.

"Printer Extent" in the "Printer Set-Up" screen lets you print a page or the scrolling region. The scrolling region is the area within the scrolling margins.

5.1.2.2 Auto Print Mode: Printing Text From The Host System

In this mode, the VT382 automatically sends a line of text from the screen to the printer when the cursor moves to the next line. Auto print mode lets you print each line as it is received from the host.

To select auto print mode, press "Ctrl-Print Screen". To turn auto print mode off, press "Ctrl-Print Screen" again.
You can also select auto print mode in "Printer Set-Up" screen.

The VT382 displays the current print mode on the status line.

5.1.2.3 Printer Controller Mode: Letting The Host Control Printing

In printer controller mode, the host system has direct control of the printer.
The VT382 sends characters received from the host directly to the printer, without displaying the characters on the screen.

You cannot use the "Print Screen" key in printer controller mode. The VT382 displays the current print mode on the status line.

NOTE

If you use the "Control Representation Mode" feature in the "Display Set-Up" screen, then printer controller mode is temporarily disabled.

5.1.2.4 Local Controller Mode: Setting Up The Printer

Local controller mode is the status which is combined printer controller mode and local mode.

To select local controller mode, you use the following two set-up features.

- "Print Mode" in "Printer Set-Up" screen : "Controller Mode"
- "On Line/Local" in "Set-Up Directory" screen : "Local"

In this mode, you can send information directly from the keyboard to the printer. The terminal does no display the information on the screen. You can use this mode to set up certain printers, without involving the host system.

When you complete printing in this mode, reset this mode ("Print Mode" and "On Line/Local" should be returned to before setting).

5.1.2.5 Sixel Print

To print the terminal screen as a graphic image, you press "Shift-Print Screen". While printing, "Wait indicator" will turn on.

You can print Sixel data, when the terminal connects to graphics printer.

You must set the features for Sixel printing in "Printer Set-Up" screen. For more information about the printing Sixel data, see Chapter 4.

NOTE

When you connect a printer without Sixel capability, "Shift-Print Screen" may print meaningless characters.

5.2 MODEMS

You need a modem if want to connect your VT382 to a computer system through a telephone line. The modem converts the serial characters set between the terminal and computer into signals that can travel over telephone lines.

For more information, see Chapter 6.

When you use modem, you must set following features,

- "Host Port Selection" in "Communications Port Set-Up" screen to "Modem Control".
- Set correct "Transmit Speed" and "Receive Speed" in "Communications Port Set-Up" screen.

CHAPTER 6

COMMUNICATION

This chapter provides information on how the VT382 communicates with a host computer, printer, or modem. The chapter shows the cables you can use for different system configurations. It describes how XON and XOFF characters help control data flow. The last section describes the signals carried by the connectors on the rear of the terminal.

The terminal operates on full-duplex asynchronous lines only, with 10 possible transmit and receive speeds. You can use split transmit and receive speeds, but you must use the same speeds as your host system and printer.

To match your host system's speed, use the "Communications Port Set-Up" screen.
To match your printer's speed, use the "Printer Set-Up" screen. See Chapter 4.

For more information on communication, see the "VT382 Programmer Reference Manual".

6.1 STANDARDS

The VT382 operates in accordance with the following communication standards.

EIA 232-D (RS-232-C)
CCITT V.24
CCITT V.26 (V.10)
CCITT X.20 bis

6.2 CABLES

You can connect the VT382 directly to a local host system with a cable. You can also connect the terminal indirectly to a remote host system, using (1) a terminal server, or (2) a modem or acoustic coupler connected to public- switched or dedicated telephone lines.

You can connect the VT382 to a local, asynchronous, serial printer by using a null modem cable.

Figure 6-1 shows the DEC423 and EIA 232-D (RS232) cables you can use to connect the VT382 to a host system or printer.

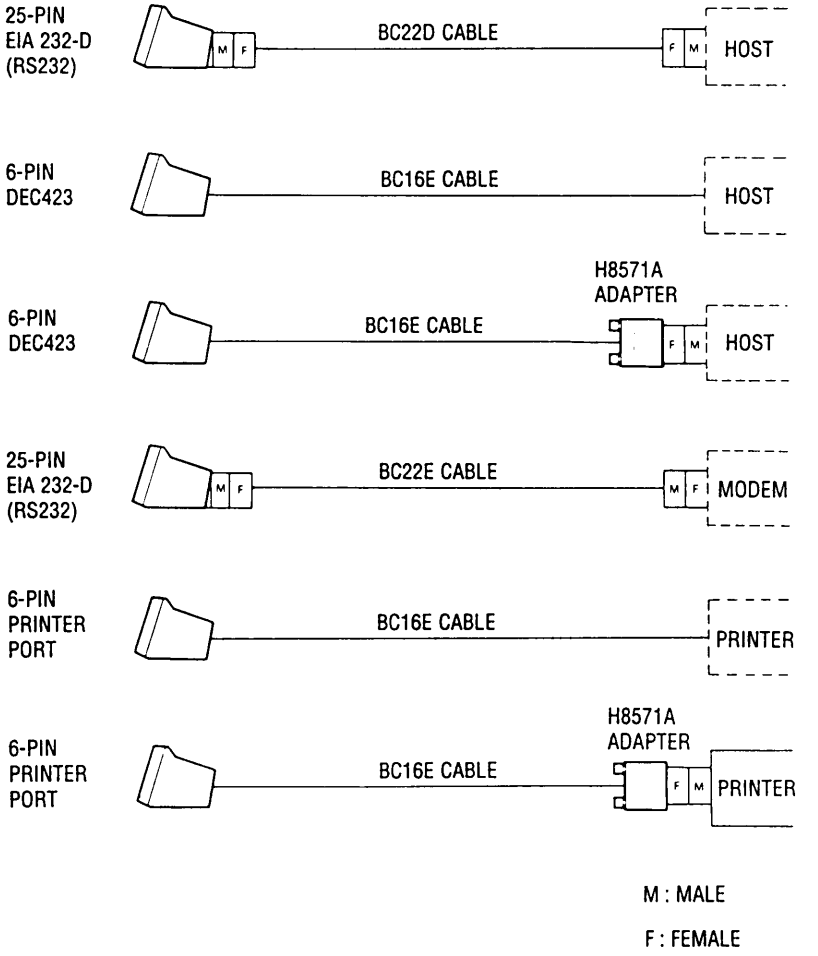


Figure 6-1 Cables

NOTE

You must use specified cables, otherwise radio frequency interference may occur.

6.3 XON/XOFF FLOW CONTROL

The VT382 stores incoming characters in a character input buffer. The buffer can hold 1024 characters. The terminal processes characters from the buffer on a first-in/first-out basis.

When the input buffer fills to 64, 256 or 512 characters, the terminal sends an XOFF code to stop the host system from sending more characters. The default setting is 64. You can select from four settings - 64, 256, 512, or no XOFF - using the "Communications Port Set-Up" screen.

NOTE

If you select "No XOFF" in set-up, the terminal does not send an XOFF code to the host system when the input buffer fills. Selecting "No XOFF" also disables the "Hold Screen" key. With XOFF disabled, there is no way to ensure that data will not be lost.

If the host system fails to respond to the XOFF code, the terminal sends a second XOFF code when the input buffer fills to 768 characters. The terminal sends a third XOFF code when the buffer is full.

When the input buffer falls below XON point(16, 80, or 160 characters), the terminal sends an XON code to tell the host system to start sending characters again. XON point is decided according to XOFF point selected in Set-Up.

If you enable XON/XOFF, when the terminal receives XOFF, it stops sending data (except XON/XOFF codes). If the keyboard data buffer overflows, the keyboard locks and the "Wait indicator" turns on. The keyboard unlocks and "Wait indicator" turns off when the terminal receives an XON.

The conditions to send XON code are,

- when the input buffer falls below XON point (16, 80, or 160).

- when "Clear Communication" is selected in the "Set-Up Directory".
- when "Recall" is selected in the "Set-Up Directory".
- when the power-up self test is completed.

The conditions to send XOFF code are,

- when the input buffer fills to 64, 256 or 512 characters.
- when the input buffer fills to 768 characters after first sending XOFF.
- when the buffer is full.

6.4 MODEM CONNECTIONS AND DISCONNECTIONS

When the VT382 makes a connection to the host system via modem, the terminal performs the following operations to ensure it is ready to send and receive.

- Unlocks the keyboard (if it was locked).
- Clears any transmission in progress.
- Clears the keyboard buffer.
- Clears the input buffer.
- Clears XOFF condition.

Any of the following conditions may disconnect the connection to the host system.

- You type "Shift-Break".
- You use the "Recall" or "Default" features in the "Set-Up Directory".
- You change the host port you are using from the RS232 port to the DEC423 port, or from the DEC423 port to the RS232 port.
  See the "Host Port Selection" feature in the "Communications Port

Set-Up" screen (Chapter 4).

- The terminal loses the data set ready (DSR) signal.
- The terminal loses the receive line signal detect (RLSD) signal or carrier detect (CD) signal for the period of time you selected in set-up. See the "Disconnect Delay" feature in the "Communications Port Set-Up" screen.
- The terminal receives a self-test command from the host system.
- The terminal receives reset command (see Appendix C).

The usual way to disconnect communications is to type "Shift-Break". The host system's response to the disconnect signal depends on the system and the software.

6.5 BREAK FUNCTION

A break condition is the occurrence of a continuous space on a communication line for greater than one character time.

The "Break" key has three functions. You can enable or disable the "Break" key in the "Keyboard Set-Up" screen.
If enabled, pressing "Break" sends a break signal to the host.

Pressing "Shift-Break" disconnects communications when you use a modem.

Pressing "Ctrl-Break" sends the answerback message (See the "Terminal Set-Up" screen in Chapter 4) to the host.

6.6 CONNECTOR SIGNALS

The VT382 has two host comm connectors and one printer connector on the rear of the terminal. Table 6-1 describes the interface signals for the 25-pin host system connector. Table 6-2 describes the signals for the 6-pin host connector and 6-pin printer connector. Figure 6-2 and 7-3 show their pin layout.

Figure 6-2 25-pin EIA 232-D (RS232) Connector

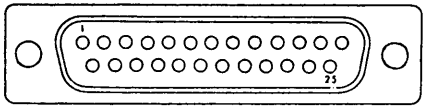


Figure 6-3 6-pin DEC423 Connector

Table 6-1 25-pin EIA 232-D (RS232) Comm Port Interface Signals

Pin	Signal	Mnemonic	EIA/CCITT/DIN	Description
2	Trans-mitted Data	TXD	BA/103/D1	From VT382 Sends serial characters. Held in mark state when characters are not being sent. In modem control modes, sends data only when RTS, CTS, DSR, and DTR signals are on.
3	Received Data	RXD	BB/104/D2	To VT382 Receives serial characters. In modem control modes, ignores characters if RLSD signal is off.

Table 6-1 25-pin EIA 232-D (RS232) Comm Port Interface Signals (cont)

Pin	Signal	Mnemonic	EIA/CCITT/DIN	Description
4	Request to Send	RTS	CA/105/S2	From VT382 When on, place the modem in transmit mode.
5	Clear to Send	CTS	CB/106/M2	To VT382 When on, tells the VT382 that the modem is ready to send.
6	Data Set Ready	DSR	CC/107/M1	To VT382 When on, tells the VT382 that the modem is in data mode and is ready to exchange RTS, CTS, and RLSD signals.
7	Signal Ground	SGND	AB/102/E2	Serves as common ground reference potential for all connector signals, except protective ground.
8	Receive Line Signal Detect (Carrier Detect)	RLSD	CF/109/M5	To VT382 When on, tells the VT382 that the signal received on the communication line is good enough to ensure correct demodulation of received data. When off, indicates no signal received, or signal is unsuitable for demodulation.
12	Speed Indicator	SPDI	CI/112/M4	To VT382 When on, enables a modem to control the terminal's transmit and receive speeds. Sets the speeds to 1200 bits per second, regardless of set-up selection.

Table 6–1 25–pin EIA 232–D (RS232) Comm Port Interface Signals (cont)

Pin	Signal	Mnemonic	EIA/CCITT/DIN	Description
20	Data Terminal Ready	DTR	CD/108.2/S1.2	From VT382 When on, tells the modem that the terminal is ready to send or receive.
23	Speed Select	SPDS	CH/111/S4	From VT382 When on, tells the modem that the receive speed selected in set–up is greater than 1200 bits per second.

Table 6–2 6–pin DEC423 Comm and Printer Interface Signals

Pin	Signal	Mnemonic	Description
1	Data Terminal Ready	DTR	From VT382 When on, tells the modem or printer that the VT382 is ready to send or receive.
2	Transmitted Data	TXD+	From VT382 Sends serial characters. Held in the mark state (–) when characters are not being sent. In modem control modes, sends data only when DSR and DTR signals are on.
3	Transmit Signal Ground	TXD–	Provides the common ground reference potential for transmitted signals TXD+ and DTR.
4	Receive Signal Ground	RXD–	Provides the common ground reference potential for received signals RXD+ and DSR.
5	Received Data	RXD+	To VT382 Receives serial characters.
6	Data Set Ready	DSR	To VT382 On Host Port: When on, tells the VT382 that the modem is in the data mode and is ready to communicate. On Printer Port: When on, tells the VT382 that the printer is ready.

CHAPTER 7

SOLVING PROBLEM AND GETTING SERVICE

7.1 OPERATING PROBLEMS

Table 7-1 lists some possible operation problems and suggested solutions. If you have a problem with your terminal, check this list before calling for service.
If you need service, see "Call for Service" in this chapter.

Table 7-1 Operating Problems

Problem	Suggested Solution
The terminal does not turn on when you set the power switch to 1.	Make sure the power cord is plugged in.
After the "VT382 OK" message appears on the screen, there is no response from the host when you try to log in.	Make sure your system cable at the rear of the terminal is connected securely, Make sure the port that your system cable is connected to is active. Check the "Host Port Selection" feature in the "Communications Port Set-Up" screen (Chapter 4). Make sure the host action.
Text on the screen does not scroll. The Hold Screen indicator is on.	Press the "Hold Screen" key to resume scrolling.

Table 7-1 Operating Problems (cont)

Problem	Suggested Solution
The keyboard seems to be locked (the "Wait indicator" may be on), and the VT382 cannot display new text from the host.	Clear the terminal by using the "Clear Comm Port" feature in the "Set-Up Directory" (Chapter 4).
The screen is blank, but the terminal is on. The power is okay.	The CRT saver feature may be on. If the CRT saver feature is on, press any key to reactivate the screen. Make sure the brightness and contrast controls are correctly adjusted.
The bell tone does not sound when you turn the VT382 on. All keyboard indicator light are off.	Make sure the keyboard is connected to the terminal.
The printer does not print.	Make sure the printer is plugged in, and its power switch on. Make sure the cable connection between the printer and terminal is tight. Make sure the communication settings on the terminal and printer match, such as baud rate and parity. See the "Printer Set-Up" screen(Chapter 4).

7.2 POWER-UP SELF-TEST

Every time you turn the terminal on, the VT382 automatically runs a power-up self-test. This test checks the operating status of many internal parts in the terminal. During the test, the keyboard indicators turn on and off, and the bell tone sounds. If the test is successful, a "VT382 OK" message appears on the screen.

7.2.1 Error Messages

If the VT382 fails the power-up self-test, the terminal may display one of the error messages in Table 7-2. Only qualified service personnel should try to correct these problems. You should note any error message that appears and call for service.

The keyboard indicator lights may flash in different patterns during the test. These patterns are codes that provide service personnel with further information about the terminal's operating condition.

Table 7-2 Screen Error Messages

Error Message	Problem
VT382 NVR Error -1	Nonvolatile memory (set-up storage) is not operating. 1. Press "Set-Up", move the filed cursor to "Default", and press "Enter". 2. Move the field cursor to "Save", and press "Enter". 3. Move the field cursor to "UDK", and press "Enter". 4. Move the field to "Save", and press "Enter". 5. Press "Set-Up". 6. Turns the VT382 power off and turn on again. 7. If the same error message is displayed, call Digital Field Service.

Table 7-2 Screen Error Messages (cont)

Error Message	Problem
VT382 RS232 Port Data Error -2	The 25-pin RS232 host connector is not working. Call Digital Field Service.
VT382 RS232 Port Controls Error -3	The 25-pin RS232 host connector is not working. Call Digital Field Service.
VT382 Keyboard Error -4	1. Make sure your keyboard is plugged in. If it is, 2. Turn the VT382 off and on. If the problem continues, 3. Try another keyboard if you have one. If the new keyboard works, replace the old keyboard. 4. If the new keyboard does not work, call Digital Field Service.
VT382 DEC423 Port Error -5	The 6-pin DEC423 host connector is not working. Call Digital Field Service.
VT382 Printer Port Error -6	The 6-pin DEC423 host connector is not working. Call Digital Field Service.

7.3 CALL FOR SERVICE

If you can not solve the problems, or the terminal displays error message on power-up self-test, you need service.
Please call Digital service center.

When you call, tell about trouble, situation, and error message.
Tell the keyboard LED pattern, if trouble on power-up self-test. The LED pattern indicates the internal function of the terminal.

APPENDIX A

SPECIFICATIONS

This appendix lists the specifications for the VT382 video terminal.

< Site Planning >

[Terminal]

Height	343 mm
Width	343 mm
Depth	350 mm
Weight	10.8 kg
Adjustable tilt	+5 to -20 degrees

[Keyboard]

Height	51 mm
Width	533 mm
Depth	171 mm
Weight	2 kg

[Environment]

	Operating	Storage
Temperature	10 to 40 (degree C)	-40 to 66(degree C)
Relative humidity	10% to 90% (No condensation)	0% to 95% (No condensation)
Maximum altitude	2.4 km	9.1 km

Electrical

Line voltage	220 to 240 Vac nominal, single-phase. 3-wire

Line frequency	47 to 63 Hz
Input power	75 W maximum
Power cord	Detachable, 3-conductor, grounded
< Display >	
CRT	350 mm (14 inch) Flat face monochrome screen 60 Hz Non-interlace
Display Size	Horizontal: 225 mm Vertical: 170 mm
Format	24 lines of 80 or 132 characters (as ASCII) 25th line (for Status line or Host-writable)
Character Cell	80 columns: 12 x 30 dots for ASCII and Thai 132 columns: 7 x 30 dots for ASCII and Thai
Character Size	80 columns: 10 x 22 dots for ASCII 11 x 26 dots for Thai 132 columns: 6 x 22 dots for ASCII 7 x 26 dots for Thai
Video attributes	Reverse video, underline, bold, and blinking - selected individually or in any combination Double width/height lines
Cursor styles	Blinking block, steady block, blinking underline, or steady underline
Built-in character sets	ASCII DEC Special Graphic DEC Supplemental ISO Latin-1 Supplemental DEC Technical Thai
< Keyboard >	
General	105-key detachable unit
Cord	1.8 m coiled cord with 4-pin telephone-type connector

SPECIFICATIONS

Key Size	12.7 mm square
Key Spacing	19 mm center to center
Function Keys	5 predefined keys, 15 user-definable keys
Indicator Light	4 keyboard indicator: Hold Screen, Lock, Thai, Wait
Audible Indicator	
Keyclick	Sounds after each keystroke.
Margin Bell	Ring, when cursor approaches right margin.
Warning Bell	Ring, when errors or when receives BEL code.

< Host Communication >

Interface	EIA 232-D (RS-232-C, 25-pin D EIA connector) DEC423(6-pin DEC MMJ connector)
Speed	75, 110, 150, 300, 600, 1200, 2400, 4800, 9600, 19200 bps
Operate	On full-duplex asynchronous
Data Format	7 bits, 8 bits
Parity	Odd, even, mark, space, none
Stop Bit	1 bit, 2 bits
Flow Control	XON/XOFF
Local Echo	Enable/Disable

< Printer Port Communication >

Interface	DEC423(6-pin DEC MMJ connector)
Speed	75, 110, 150, 300, 600, 1200, 2400, 4800, 9600, 19200 bps
Operate	On full-duplex asynchronous
Data Format	7 bits, 8 bits
Parity	Odd, even, mark, space, none
Stop Bit	1 bit, 2 bits
Flow Control	XON/XOFF
Printer to Host	Enable/Disable

APPENDIX B

ORDERING INFORMATION FOR DOCUMENTATION

This appendix describes the documentation for the VT382 terminal. Part numbers are included.

.VT382 Programmer Reference Manual	EK-VT38T-RM

APPENDIX C

VT382 CONTROL FUNCTION SUMMARY

This appendix is a summary of the control functions and commands described in the VT382 Programmer Reference Manual. If you are a programmer, you can use this appendix as a quick-reference tool to program the VT382.

The appendix is divided into sections that correspond to the chapter of the programmer reference manual.

Section

Character Encoding
Keyboard Codes
Emulating VT Series Terminals
Using Character Sets
Screen Display Commands
Visual Character and Line Attributes
Editing
Controlling the Cursor
Keyboard and Printing Commands
Reports
Sixel
Resetting and Testing
VT52 Mode Control Codes

C.1 CHARACTER ENCODING

C.1.1 Character Sets And Codes

Computer systems store characters as a series of bits, usually 7 bits or 8 bits long. A bit is a binary digit. The VT382 can work with 7 bit or 8 bit systems.
The VT382 provides the following character sets

ASCII
DEC Special Graphic
DEC Supplemental
ISO Latin-1 Supplemental
DEC Technical
Thai

An 8-bit system can use any of these character sets. A 7-bit system can use any of these character sets.

There are two types of character sets. One is graphic character set and the other is control character set.
Graphic characters are the characters you can display on the screen.
Control characters make the terminal perform a special function. There are C0 control character set and C1 control character set. See "Control Functions" in this appendix.

A code table is a convenient way of all the characters in a character set with their codes. Characters appear in rows and columns. One way of finding a character in a character set is by its column/row position. For example, in the character H is at 4/8 (column 4, row 8).

Each following table is one of the standard sets in the VT382.

Each character in a row uses the same binary code for its four least significant bits. This value appears at the left or right of each row. Each character in a column uses the same binary code for its three (or four) most significant bits. This value appears at the top of each column.

Next to each character appears the octal, decimal, and hexadecimal code for the character. Different programmer may prefer using octal, decimal, or hexadecimal values for different purposes.

1. ASCII Character Set

ASCII Character Set : C0 Codes, GL

ROW	COLUMN 0			COLUMN 1			COLUMN 2			COLUMN 3			COLUMN 4			COLUMN 5			COLUMN 6			COLUMN 7		
	BITS b7 b6 b5 / b4 b3 b2 b1	0 0 0		0 0 1			0 1 0			0 1 1			1 0 0			1 0 1			1 1 0			1 1 1		
0	0 0 0 0	NUL	0 0 0	DLE	20 16 10		SP	40 32 20		0	60 48 30		@	100 64 40		P	120 80 50		`	140 96 60		p	160 112 70
1	0 0 0 1	SOH	1 1 1	DC1 (XON)	21 17 11		!	41 33 21		1	61 49 31		A	101 65 41		Q	121 81 51		a	141 97 61		q	161 113 71
2	0 0 1 0	STX	2 2 2	DC2	22 18 12		"	42 34 22		2	62 50 32		B	102 66 42		R	122 82 52		b	142 98 62		r	162 114 72
3	0 0 1 1	ETX	3 3 3	DC3 (XOFF)	23 19 13		#	43 35 23		3	63 51 33		C	103 67 43		S	123 83 53		c	143 99 63		s	163 115 73
4	0 1 0 0	EOT	4 4 4	DC4	24 20 14		$	44 36 24		4	64 52 34		D	104 68 44		T	124 84 54		d	144 100 64		t	164 116 74
5	0 1 0 1	ENQ	5 5 5	NAK	25 21 15		%	45 37 25		5	65 53 35		E	105 69 45		U	125 85 55		e	145 101 65		u	165 117 75
6	0 1 1 0	ACK	6 6 6	SYN	26 22 16		&	46 38 26		6	66 54 36		F	106 70 46		V	126 86 56		f	146 102 66		v	166 118 76
7	0 1 1 1	BEL	7 7 7	ETB	27 23 17		'	47 39 27		7	67 55 37		G	107 71 47		W	127 87 57		g	147 103 67		w	167 119 77
8	1 0 0 0	BS	10 8 8	CAN	30 24 18		(	50 40 28		8	70 56 38		H	110 72 48		X	130 88 58		h	150 104 68		x	170 120 78
9	1 0 0 1	HT	11 9 9	EM	31 25 19		)	51 41 29		9	71 57 39		I	111 73 49		Y	131 89 59		i	151 105 69		y	171 121 79
10	1 0 1 0	LF	12 10 A	SUB	32 26 1A		*	52 42 2A		:	72 58 3A		J	112 74 4A		Z	132 90 5A		j	152 106 6A		z	172 122 7A
11	1 0 1 1	VT	13 11 B	ESC	33 27 1B		+	53 43 2B		;	73 59 3B		K	113 75 4B		[	133 91 5B		k	153 107 6B		{	173 123 7B
12	1 1 0 0	FF	14 12 C	FS	34 28 1C		,	54 44 2C		<	74 60 3C		L	114 76 4C		\	134 92 5C		l	154 108 6C		|	174 124 7C
13	1 1 0 1	CR	15 13 D	GS	35 29 1D		-	55 45 2D		=	75 61 3D		M	115 77 4D		]	135 93 5D		m	155 109 6D		}	175 125 7D
14	1 1 1 0	SO	16 14 E	RS	36 30 1E		.	56 46 2E		>	76 62 3E		N	116 78 4E		^	136 94 5E		n	156 110 6E		~	176 126 7E
15	1 1 1 1	SI	17 15 F	US	37 31 1F		/	57 47 2F		?	77 63 3F		O	117 79 4F		_	137 95 5F		o	157 111 6F		DEL	177 127 7F
		← C0 CODE →					← GL (ASCII) →																	

2. DEC Special Graphic Set

DEC Special Graphic Set : C0 Codes, GL

ROW	COLUMN 0			1			2			3			4			5			6			7		
	BITS B7 B6 B5 B4 B3 B2 B1			0 0 0			0 0 1			0 1 0			0 1 1			1 0 0			1 0 1			1 1 0			1 1 1		
0	0 0 0 0	NUL	0 0 0	DLE	20 16 10		SP	40 32 20		0	60 48 30		@	100 64 40		P	120 80 50		♦	140 96 60		– SCAN 3	160 112 70	
1	0 0 0 1	SOH	1 1 1	DC1 (XON)	21 17 11		!	41 33 21		1	61 49 31		A	101 65 41		Q	121 81 51		▒	141 97 61		– SCAN 5	161 113 71	
2	0 0 1 0	STX	2 2 2	DC2	22 18 12		"	42 34 22		2	62 50 32		B	102 66 42		R	122 82 52		␉	142 98 62		– SCAN 7	162 114 72	
3	0 0 1 1	ETX	3 3 3	DC3 (XOFF)	23 19 13		#	43 35 23		3	63 51 33		C	103 67 43		S	123 83 53		␌	143 99 63		– SCAN 9	163 115 73	
4	0 1 0 0	EOT	4 4 4	DC4	24 20 14		$	44 36 24		4	64 52 34		D	104 68 44		T	124 84 54		␍	144 100 64		┼	164 116 74	
5	0 1 0 1	ENQ	5 5 5	NAK	25 21 15		%	45 37 25		5	65 53 35		E	105 69 45		U	125 85 55		␊	145 101 65		┤	165 117 75	
6	0 1 1 0	ACK	6 6 6	SYN	26 22 16		&	46 38 26		6	66 54 36		F	106 70 46		V	126 86 56		␀	146 102 66		┴	166 118 76	
7	0 1 1 1	BEL	7 7 7	ETB	27 23 17		'	47 39 27		7	67 55 37		G	107 71 47		W	127 87 57		±	147 103 67		┬	167 119 77	
8	1 0 0 0	BS	10 8 8	CAN	30 24 18		(	50 40 28		8	70 56 38		H	110 72 48		X	130 88 58		␤	150 104 68		│	170 120 78	
9	1 0 0 1	HT	11 9 9	EM	31 25 19		)	51 41 29		9	71 57 39		I	111 73 49		Y	131 89 59		␋	151 105 69		≤	171 121 79	
10	1 0 1 0	LF	12 10 A	SUB	32 26 1A		*	52 42 2A		:	72 58 3A		J	112 74 4A		Z	132 90 5A		┘	152 106 6A		≥	172 122 7A	
11	1 0 1 1	VT	13 11 B	ESC	33 27 1B		+	53 43 2B		;	73 59 3B		K	113 75 4B		[	133 91 5B		┐	153 107 6B		π	173 123 7B	
12	1 1 0 0	FF	14 12 C	FS	34 28 1C		,	54 44 2C		<	74 60 3C		L	114 76 4C		\	134 92 5C		┌	154 108 6C		≠	174 124 7C	
13	1 1 0 1	CR	15 13 D	GS	35 29 1D		-	55 45 2D		=	75 61 3D		M	115 77 4D		]	135 93 5D		└	155 109 6D		£	175 125 7D	
14	1 1 1 0	SO	16 14 E	RS	36 30 1E		.	56 46 2E		>	76 62 3E		N	116 78 4E		^	136 94 5E		┼	156 110 6E		·	176 126 7E	
15	1 1 1 1	SI	17 15 F	US	37 31 1F		/	57 47 2F		?	77 63 3F		O	117 79 4F		(BLANK)	137 95 5F		– SCAN 1	157 111 6F		DEL	177 127 7F	
		← C0 CODE →					← GL (DEC SPECIAL GRAPHIC) →																	

3. DEC Supplemental Graphic Set

DEC Supplemental Graphic Set : C1 Codes, GR

8		9		10		11		12		13		14		15		COLUMN	
1 0 0 0		1 0 0 1		1 0 1 0		1 0 1 1		1 1 0 0		1 1 0 1		1 1 1 0		1 1 1 1		b8 b7 BITS b6 b5 b4 b3 b2 b1	ROW
	200 128 80	DCS	220 144 90		240 160 A0	°	260 176 B0	À	300 192 C0		320 208 D0	à	340 224 E0		360 240 F0	0 0 0 0	0
	201 129 81	PU1	221 145 91	¡	241 161 A1	±	261 177 B1	Á	301 193 C1	Ñ	321 209 D1	á	341 225 E1	ñ	361 241 F1	0 0 0 1	1
	202 130 82	PU2	222 146 92	¢	242 162 A2	2	262 178 B2	Â	302 194 C2	Ò	322 210 D2	â	342 226 E2	ò	362 242 F2	0 0 1 0	2
	203 131 83	STS	223 147 93	£	243 163 A3	3	263 179 B3	Ã	303 195 C3	Ó	323 211 D3	ã	343 227 E3	ó	363 243 F3	0 0 1 1	3
IND	204 132 84	CCH	224 148 94		244 164 A4		264 180 B4	Ä	304 196 C4	Ô	324 212 D4	ä	344 228 E4	ô	364 244 F4	0 1 0 0	4
NEL	205 133 85	MW	225 149 95	¥	245 165 A5	µ	265 181 B5	Å	305 197 C5	Õ	325 213 D5	å	345 229 E5	õ	365 245 F5	0 1 0 1	5
SSA	206 134 86	SPA	226 150 96		246 166 A6	¶	266 182 B6	Æ	306 198 C6	Ö	326 214 D6	æ	346 230 E6	ö	366 246 F6	0 1 1 0	6
ESA	207 135 87	EPA	227 151 97	§	247 167 A7	·	267 183 B7	Ç	307 199 C7	Œ	327 215 D7	ç	347 231 E7	œ	367 247 F7	0 1 1 1	7
HTS	210 136 88	SOS	230 152 98	¤	250 168 A8		270 184 B8	È	310 200 C8	Ø	330 216 D8	è	350 232 E8	ø	370 248 F8	1 0 0 0	8
HTJ	211 137 89		231 153 99	©	251 169 A9	1	271 185 B9	É	311 201 C9	Ù	331 217 D9	é	351 233 E9	ù	371 249 F9	1 0 0 1	9
VTS	212 138 8A		232 154 9A	ª	252 170 AA	º	272 186 BA	Ê	312 202 CA	Ú	332 218 DA	ê	352 234 EA	ú	372 250 FA	1 0 1 0	10
PLD	213 139 8B	CSI	233 155 9B	«	253 171 AB	»	273 187 BB	Ë	313 203 CB	Û	333 219 DB	ë	353 235 EB	û	373 251 FB	1 0 1 1	11
PLU	214 140 8C	ST	234 156 9C		254 172 AC	¼	274 188 BC	Ì	314 204 CC	Ü	334 220 DC	ì	354 236 EC	ü	374 252 FC	1 1 0 0	12
RI	215 141 8D	OSC	235 157 9D		255 173 AD	½	275 189 BD	Í	315 205 CD	Ý	335 221 DD	í	355 237 ED	ý	375 253 FD	1 1 0 1	13
SS2	216 142 8E	PM	236 158 9E		256 174 AE		276 190 BE	Î	316 206 CE		336 222 DE	î	356 238 EE		376 254 FE	1 1 1 0	14
SS3	217 143 8F	APC	237 159 9F		257 175 AF	¿	277 191 BF	Ï	317 207 CF	ß	337 223 DF	ï	357 239 EF		377 255 FF	1 1 1 1	15
← C1 CODE →				← GR (DEC SUPPLEMENTAL GRAPHIC) →													

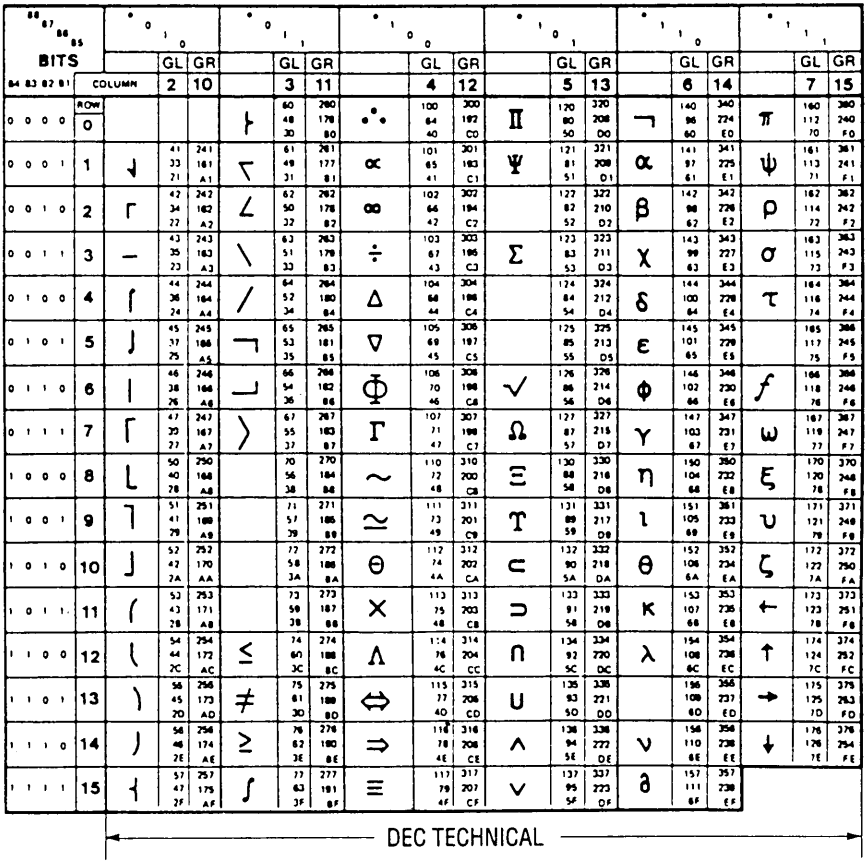
4. ISO Latin-1 Supplemental Graphic Set

ISO Latin-1 Supplemental Graphic Set : C1 Codes, GR

8		9		10		11		12		13		14		15		COLUMN / BITS b8 b7 b6 b5	ROW
	200 128 80	DCS	220 144 90	NBSP	240 160 A0	°	260 176 B0	À	300 192 C0	Ð	320 208 D0	à	340 224 E0	ð	360 240 F0	0 0 0 0	0
	201 129 81	PU1	221 145 91	¡	241 161 A1	±	261 177 B1	Á	301 193 C1	Ñ	321 209 D1	á	341 225 E1	ñ	361 241 F1	0 0 0 1	1
	202 130 82	PU2	222 146 92	¢	242 162 A2	2	262 178 B2	Â	302 194 C2	Ò	322 210 D2	â	342 226 E2	ò	362 242 F2	0 0 1 0	2
	203 131 83	STS	223 147 93	£	243 163 A3	3	263 179 B3	Ã	303 195 C3	Ó	323 211 D3	ã	343 227 E3	ó	363 243 F3	0 0 1 1	3
IND	204 132 84	CCH	224 148 94	¤	244 164 A4	´	264 180 B4	Ä	304 196 C4	Ô	324 212 D4	ä	344 228 E4	ô	364 244 F4	0 1 0 0	4
NEL	205 133 85	MW	225 149 95	¥	245 165 A5	µ	265 181 B5	Å	305 197 C5	Õ	325 213 D5	å	345 229 E5	õ	365 245 F5	0 1 0 1	5
SSA	206 134 86	SPA	226 150 96	¦	246 166 A6	¶	266 182 B6	Æ	306 198 C6	Ö	326 214 D6	æ	346 230 E6	ö	366 246 F6	0 1 1 0	6
ESA	207 135 87	EPA	227 151 97	§	247 167 A7	·	267 183 B7	Ç	307 199 C7	×	327 215 D7	ç	347 231 E7	÷	367 247 F7	0 1 1 1	7
HTS	210 136 88	SOS	230 152 98	¨	250 168 A8	¸	270 184 B8	È	310 200 C8	Ø	330 216 D8	è	350 232 E8	ø	370 248 F8	1 0 0 0	8
HTJ	211 137 89		231 153 99	©	251 169 A9	1	271 185 B9	É	311 201 C9	Ù	331 217 D9	é	351 233 E9	ù	371 249 F9	1 0 0 1	9
VTS	212 138 8A		232 154 9A	ª	252 170 AA	º	272 186 BA	Ê	312 202 CA	Ú	332 218 DA	ê	352 234 EA	ú	372 250 FA	1 0 1 0	10
PLD	213 139 8B	CSI	233 155 9B	«	253 171 AB	»	273 187 BB	Ë	313 203 CB	Û	333 219 DB	ë	353 235 EB	û	373 251 FB	1 0 1 1	11
PLU	214 140 8C	ST	234 156 9C	¬	254 172 AC	¼	274 188 BC	Ì	314 204 CC	Ü	334 220 DC	ì	354 236 EC	ü	374 252 FC	1 1 0 0	12
RI	215 141 8D	OSC	235 157 9D		255 173 AD	½	275 189 BD	Í	315 205 CD	Ý	335 221 DD	í	355 237 ED	ý	375 253 FD	1 1 0 1	13
SS2	216 142 8E	PM	236 158 9E	®	256 174 AE	¾	276 190 BE	Î	316 206 CE	Þ	336 222 DE	î	356 238 EE	þ	376 254 FE	1 1 1 0	14
SS3	217 143 8F	APC	237 159 9F	¯	257 175 AF	¿	277 191 BF	Ï	317 207 CF	ß	337 223 DF	ï	357 239 EF	ÿ	377 255 FF	1 1 1 1	15
← C1 CODE →				← GR (ISO Latin-1 SUPPLEMENTAL GRAPHIC) →													

5. DEC Technical Character Set

DEC Technical Character Set



6. Thai Character Set

The VT382 has Thai Character Set : C1 Codes, GR

8		9		10		11		12		13		14		15		COLUMN b8 b7 BITS b6 b5 b4 b3 b2 b1	ROW
1 0 0 0		1 0 0 1		1 0 1 0		1 0 1 1		1 1 0 0		1 1 0 1		1 1 1 0		1 1 1 1			
	200 128 80	DCS	220 144 90		240 160 A0	ฐ	260 176 B0	ภ	300 192 C0	ะ	320 208 D0	เ	340 224 E0	๐	360 240 F0	0 0 0 0	0
	201 129 81	PU1	221 145 91	ก	241 161 A1	ฑ	261 177 B1	ม	301 193 C1	ั	321 209 D1	แ	341 225 E1	๑	361 241 F1	0 0 0 1	1
	202 130 82	PU2	222 146 92	ข	242 162 A2	ฒ	262 178 B2	ย	302 194 C2	า	322 210 D2	โ	342 226 E2	๒	362 242 F2	0 0 1 0	2
	203 131 83	STS	223 147 93	ฃ	243 163 A3	ณ	263 179 B3	ร	303 195 C3	ำ	323 211 D3	ใ	343 227 E3	๓	363 243 F3	0 0 1 1	3
IND	204 132 84	CCH	224 148 94	ค	244 164 A4	ด	264 180 B4	ฤ	304 196 C4	ิ	324 212 D4	ไ	344 228 E4	๔	364 244 F4	0 1 0 0	4
NEL	205 133 85	MW	225 149 95	ฅ	245 165 A5	ต	265 181 B5	ล	305 197 C5	ี	325 213 D5	ๅ	345 229 E5	๕	365 245 F5	0 1 0 1	5
SSA	206 134 86	SPA	226 150 96	ฆ	246 166 A6	ถ	266 182 B6	ฦ	306 198 C6	ึ	326 214 D6	ๆ	346 230 E6	๖	366 246 F6	0 1 1 0	6
ESA	207 135 87	EPA	227 151 97	ง	247 167 A7	ท	267 183 B7	ว	307 199 C7	ื	327 215 D7	็	347 231 E7	๗	367 247 F7	0 1 1 1	7
HTS	210 136 88	SOS	230 152 98	จ	250 168 A8	ธ	270 184 B8	ศ	310 200 C8	ุ	330 216 D8	่	350 232 E8	๘	370 248 F8	1 0 0 0	8
HTJ	211 137 89		231 153 99	ฉ	251 169 A9	น	271 185 B9	ษ	311 201 C9	ู	331 217 D9	้	351 233 E9	๙	371 249 F9	1 0 0 1	9
VTS	212 138 8A		232 154 9A	ช	252 170 AA	บ	272 186 BA	ส	312 202 CA	ฺ	332 218 DA	๊	352 234 EA	ฯ	372 250 FA	1 0 1 0	10
PLD	213 139 8B	CSI	233 155 9B	ซ	253 171 AB	ป	273 187 BB	ห	313 203 CB		333 219 DB	๋	353 235 EB	๚	373 251 FB	1 0 1 1	11
PLU	214 140 8C	ST	234 156 9C	ฌ	254 172 AC	ผ	274 188 BC	อ	314 204 CC		334 220 DC	์	354 236 EC		374 252 FC	1 1 0 0	12
RI	215 141 8D	OSC	235 157 9D	ญ	255 173 AD	ฝ	275 189 BD	ฮ	315 205 CD		335 221 DD	๐	355 237 ED		375 253 FD	1 1 0 1	13
SS2	216 142 8E	PM	236 158 9E	ฎ	256 174 AE	พ	276 190 BE	ฯ	316 206 CE		336 222 DE	๎	356 238 EE		376 254 FE	1 1 1 0	14
SS3	217 143 8F	APC	237 159 9F	ฏ	257 175 AF	ฟ	277 191 BF	ๆ	317 207 CF	฿	337 223 DF	๏	357 239 EF		377 255 FF	1 1 1 1	15
← C1 CODE →				← GR(THAI) →													

C.1.2 Display Controls Font

You can have the terminal display the characters in your control functions, rather than performing the functions. This is useful for debugging programs. To display control characters., you use Controls feature in the "Display Set-Up" screen (Chapter 4).

Display Controls Font (Left Half)

ROW	COLUMN 0	1	2	3	4	5	6	7
0	NU 0 0 0	DL 20 16 10	40 32 20	0 60 48 30	@ 100 64 40	P 120 80 50	` 140 96 60	p 160 112 70
1	SH 1 1 1	D1 21 17 11	! 41 33 21	1 61 49 31	A 101 65 41	Q 121 81 51	a 141 97 61	q 161 113 71
2	SX 2 2 2	D2 22 18 12	" 42 34 22	2 62 50 32	B 102 66 42	R 122 82 52	b 142 98 62	r 162 114 72
3	EX 3 3 3	D3 23 19 13	# 43 35 23	3 63 51 33	C 103 67 43	S 123 83 53	c 143 99 63	s 163 115 73
4	ET 4 4 4	D4 24 20 14	$ 44 36 24	4 64 52 34	D 104 68 44	T 124 84 54	d 144 100 64	t 164 116 74
5	ED 5 5 5	NK 25 21 15	% 45 37 25	5 65 53 35	E 105 69 45	U 125 85 55	e 145 101 65	u 165 117 75
6	AK 6 6 6	SY 26 22 16	& 46 38 26	6 66 54 36	F 106 70 46	V 126 86 56	f 146 102 66	v 166 118 76
7	BL 7 7 7	EB 27 23 17	' 47 39 27	7 67 55 37	G 107 71 47	W 127 87 57	g 147 103 67	w 167 119 77
8	BS 10 8 8	CN 30 24 18	(50 40 28	8 70 56 38	H 110 72 48	X 130 88 58	h 150 104 68	x 170 120 78
9	HT 11 9 9	EM 31 25 19	) 51 41 29	9 71 57 39	I 111 73 49	Y 131 89 59	i 151 105 69	y 171 121 79
10	LF 12 10 A	SB 32 26 1A	* 52 42 2A	: 72 58 3A	J 112 74 4A	Z 132 90 5A	j 152 106 6A	z 172 122 7A
11	VT 13 11 B	EC 33 27 1B	+ 53 43 2B	; 73 59 3B	K 113 75 4B	[133 91 5B	k 153 107 6B	{ 173 123 7B
12	FF 14 12 C	FS 34 28 1C	, 54 44 2C	< 74 60 3C	L 114 76 4C	\ 134 92 5C	l 154 108 6C	| 174 124 7C
13	CR 15 13 D	GS 35 29 1D	- 55 45 2D	= 75 61 3D	M 115 77 4D	] 135 93 5D	m 155 109 6D	} 175 125 7D
14	SO 16 14 E	RS 36 30 1E	56 46 2E	> 76 62 3E	N 116 78 4E	^ 136 94 5E	n 156 110 6E	~ 176 126 7E
15	SI 17 15 F	US 37 31 1F	/ 57 47 2F	? 77 63 3F	O 117 79 4F	_ 137 95 5F	o 157 111 6F	DT 177 127 7F

← C0 CODES → ← GL CODES (ASCII) →

Display Controls Font (Right Half)

8	9	10	11	12	13	14	15	COLUMN / BITS b8 b7 b6 b5	ROW
1 0 0 0	1 0 0 1	1 0 1 0	1 0 1 1	1 1 0 0	1 1 0 1	1 1 1 0	1 1 1 1	b4 b3 b2 b1	
8 0 200 128 80	9 0 220 144 90	240 160 A0	260 176 B0	À 300 192 C0	Ð 320 208 D0	à 340 224 E0	ð 360 240 F0	0 0 0 0	0
8 1 201 129 81	9 1 221 145 91	¡ 241 161 A1	± 261 177 B1	Á 301 193 C1	Ñ 321 209 D1	á 341 225 E1	ñ 361 241 F1	0 0 0 1	1
8 2 202 130 82	9 2 222 146 92	¢ 242 162 A2	2 262 178 B2	Â 302 194 C2	Ò 322 210 D2	â 342 226 E2	ò 362 242 F2	0 0 1 0	2
8 3 203 131 83	9 3 223 147 93	£ 243 163 A3	3 263 179 B3	Ã 303 195 C3	Ó 323 211 D3	ã 343 227 E3	ó 363 243 F3	0 0 1 1	3
8 4 204 132 84	9 4 224 148 94	¤ 244 164 A4	´ 264 180 B4	Ä 304 196 C4	Ô 324 212 D4	ä 344 228 E4	ô 364 244 F4	0 1 0 0	4
8 5 205 133 85	9 5 225 149 95	¥ 245 165 A5	µ 265 181 B5	Å 305 197 C5	Õ 325 213 D5	å 345 229 E5	õ 365 245 F5	0 1 0 1	5
8 6 206 134 86	9 6 226 150 96	¦ 246 166 A6	¶ 266 182 B6	Æ 306 198 C6	Ö 326 214 D6	æ 346 230 E6	ö 366 246 F6	0 1 1 0	6
8 7 207 135 87	9 7 227 151 97	§ 247 167 A7	· 267 183 B7	Ç 307 199 C7	× 327 215 D7	ç 347 231 E7	÷ 367 247 F7	0 1 1 1	7
8 8 210 136 88	9 8 230 152 98	¨ 250 168 A8	¸ 270 184 B8	È 310 200 C8	Ø 330 216 D8	è 350 232 E8	ø 370 248 F8	1 0 0 0	8
8 9 211 137 89	9 9 231 153 99	© 251 169 A9	1 271 185 B9	É 311 201 C9	Ù 331 217 D9	é 351 233 E9	ù 371 249 F9	1 0 0 1	9
8 A 212 138 8A	9 A 232 154 9A	ª 252 170 AA	º 272 186 BA	Ê 312 202 CA	Ú 332 218 DA	ê 352 234 EA	ú 372 250 FA	1 0 1 0	10
8 B 213 139 8B	9 B 233 155 9B	« 253 171 AB	» 273 187 BB	Ë 313 203 CB	Û 333 219 DB	ë 353 235 EB	û 373 251 FB	1 0 1 1	11
8 C 214 140 8C	9 C 234 156 9C	¬ 254 172 AC	¼ 274 188 BC	Ì 314 204 CC	Ü 334 220 DC	ì 354 236 EC	ü 374 252 FC	1 1 0 0	12
8 D 215 141 8D	9 D 235 157 9D	— 255 173 AD	½ 275 189 BD	Í 315 205 CD	Ý 335 221 DD	í 355 237 ED	ý 375 253 FD	1 1 0 1	13
8 E 216 142 8E	9 E 236 158 9E	® 256 174 AE	¾ 276 190 BE	Î 316 206 CE	Þ 336 222 DE	î 356 238 EE	þ 376 254 FE	1 1 1 0	14
8 F 217 143 8F	9 F 237 159 9F	¯ 257 175 AF	¿ 277 191 BF	Ï 317 207 CF	ß 337 223 DF	ï 357 239 EF	ÿ 377 255 FF	1 1 1 1	15

← C1 CODES →

← GR CODES (ISO LATIN-1 SUPPLEMENTAL GRAPHIC) →

C.1.3 Control Functions

Programmers use control functions to make the VT382 perform a range of special actions, from the simple (moving the cursor) to the complex (emulation another terminal). The way you enter control functions in an application depends on two factors: your computing system and the programming language you use.

There are two types of control functions, single-character and multiple-character. Single-character functions, called control characters, perform simpler functions. There are two groups of control characters, C0 and C1. C0 characters appear in columns 0 and 1 of the code tables. C1 characters appear in columns 8 and 9. C1 characters are not available in 7-bit systems.
The next section lists the function of each control character.

Control functions can perform more complex functions. There are three types of multiple-character control functions: escape sequences, control sequences, and device control strings. Each type begins with a certain control character.

<Escape Sequences>
An escape sequence begins with the C0 character ESC, followed by one or more graphic characters from the ASCII set. The ESC character tells system that the graphic characters are part of a control function, not characters to be displayed. For example,

ESC # 6

is an escape sequence that changes the current line of text to double-width characters. Escape sequences use only 7-bit characters, and can be used in 7-bit or 8-bit systems.

<Control Sequences>
A control sequence begins with the C1 character CSI, followed by one or more ASCII graphic characters. You can also express CSI as two 7-bit characters, ESC [. So you can express control sequences as escape sequences. For example, the following two sequences perform the same function — they change the display from 80 to 132 columns per line.

CSI ? 3 h
ESC [? 3 h

Whenever possible use CSI instead of ESC [to introduce a control sequence. You can only use CSI in 8-bit systems.

<Device Control Strings>
A device control string begins with the C1 character DCS, followed by one or more ASCII graphic characters, a data string, and the C1 character

ST(string terminator). For an example of a device control string, see "User-Preference Supplemental Set" in this appendix.

For 7-bit systems, you can express DCS as ESC P. You can express ST as ESC \.

Control Functions C0 (7-Bit) Control Characters Recognized

Name	Mnemonic	Function
Null	NUL	Ignored.
Enquiry	ENQ	Sends the answerback message.
Bell	BEL	Sounds the bell tone if the bell is enable in Set-Up.
Backspace	BS	Moves the cursor one character position to the left. If the cursor is at the left margin, no action occurs.
Horizontal tab	HT	Moves the cursor to the next tab stop. If there are no more tab stops, the cursor moves to the the right margin. HT does not cause text to auto wrap.
Line feed	LF	Causes a line feed or a new line operation, depending on the setting of line feed/new line mode.
Vertical tab	VT	Treated as LF.
Form feed	FF	Treated as LF.
Carriage return	CR	Moves the cursor to the left margin on the current line.
Shift out (Locking Shift 1)	SO(LS1)	Maps the G1 character set into GL. You designate G1 by using a select character set (SCS) sequence.
Shift in (Locking Shift 0)	SI(LS0)	Maps the G0 character set into GL. You designate G0 by using a select character set (SCS) sequence.
Device control 1 (XON)	DC1	Also known as XON. If XON/XOFF flow control is enabled in Set-Up, DC1 clears DC3(XOFF). This action causes the VT382 to continue sending characters.
Device control 3 (XOFF)	DC3	Also known as XOFF. If XON/XOFF flow control is enabled in Set-Up, DC3 causes the VT382 to stop sending characters. The terminal cannot resume sending characters until it receives a DC1 control character.
Cancel	CAN	Immediately cancels an escape sequence or control sequence in progress. The VT382 does not display any error characters.

Control Functions C0 (7-Bit) Control Characters Recognized (cont)

Name	Mnemonic	Function
Substitute	SUB	Immediately cancels an escape sequence or control sequence in progress. The VT382 displays a reverse question mark (reverse?) for an error character.
Escape	ESC	Introduces an escape sequence. ESC also cancels any escape sequence or control sequence in progress.
Delete	DEL	Ignored when received. DEL is not used as a fill character. Digital does not recommend using DEL as a fill character. Use NUL instead.

C1 (8-Bit) Control Characters Recognized

Name	Mnemonic	Function
Index	IND	Moves the cursor down one line in the same column. If the cursor is at the bottom margin, data on the screen scrolls up.
Next line	NEL	Moves the cursor to the first position on the next line. If the cursor is at the bottom margin, data on the screen scrolls up.
Horizontal tab set	HTS	Sets a horizontal tab stop at the column where the cursor is.
Reverse index	RI	Moves the cursor up one line in the same column. If the cursor is at the top margin, data on the screen scrolls down.
Single shift 2	SS2	Temporarily maps the G2 character set into GL, for the next graphic character, You designate the G2 set by using a select character set (SCS) sequence.
Single shift 3	SS3	Temporarily maps the G3 character set into GL, for the next graphic character. You designate the G3 set by using a select character set(SCS) sequence.
Device control string	DCS	Introduces a device control string.
Start of String	SOS	Introduces string. *
Control sequence introducer	CSI	Introduces a control sequence
String terminator	ST	Ends a control string.You use ST in combination with DCS, APC, OSC, PM, or SOS control strings.
Operating system command	OSC	Introduces an operating system command. *
Privacy message	PM	Introduces a privacy message string.*
Application program command	APC	Introduces an application program command. *

* The VT382 ignores all following characters, until it receives an ST control character.

8-Bit Control Characters and Their 7-bit Equivalents

Name	8-Bit Control Character	7-Bit Sequence
Index	IND	ESC D
Next line	NEL	ESC E
Horizontal tab set	HTS	ESC H
Reverse index	RI	ESC M
Single shift 2	SS2	ESC N
Single shift 3	SS3	ESC O *
Device control string	DCS	ESC P
Start of String	SOS	ESC X
Control sequence introducer	CSI	ESC [
String terminator	ST	ESC \
Operating system command	OSC	ESC]
Privacy message	PM	ESC ^
Application program command	APC	ESC _

* The last character is uppercase "o".

C.2 KEYBOARD CODES

Code Sent by Editing Keys

	Code Sent	
Key	VT300 Mode	VT100, VT52 Mode
Find	CSI 1 ~	The editing keys do not send codes in these two modes.
Insert Here	CSI 2 ~	
Remove	CSI 3 ~	
Select	CSI 4 ~	
Prev Screen	CSI 5 ~	
Next Screen	CSI 6 ~	

Codes Sent by Arrow Keys

Cursor Key Mode Setting (DECCKM)

	ANSI Mode		VT52 Mode *
Key	Cursor	Application	Cursor or Application
up	CSI A	SS3 A	ESC A
down	CSI B	SS3 B	ESC B
right	CSI C	SS3 C	ESC C
left	CSI D	SS3 D	ESC D

*ANSI mode applies to VT300 and VT100 modes. VT52 mode is not with ANSI mode.

Code Sent by Numeric Keypad Keys

	ANSI Mode*		VT52 Mode*	
Key	Numeric	Application	Numeric	Application
0	0	SS3 P	0	ESC ? p
1	1	SS3 q	1	ESC ? q
2	2	SS3 r	2	ESC ? r
3	3	SS3 s	3	ESC ? s
4	4	SS3 t	4	ESC ? t
5	5	SS3 u	5	ESC ? u
6	6	SS3 v	6	ESC ? v
7	7	SS3 w	7	ESC ? w
8	8	SS3 x	8	ESC ? x
9	9	SS3 y	9	ESC ? y
-	(minus)	SS3 m	-	ESC ? m
,	(comma)	SS3 l *2	,	ESC ? l *2, *3
.	(period)	SS3 n	.	ESC ? n
Enter	CR or CR LF *4	SS3 M	CR or CR LF *4	ESC ? M
PF1	SS3 P	SS3 P	ESC P	ESC P
PF2	SS3 Q	SS3 Q	ESC Q	ESC Q
PF3	SS3 R	SS3 R	ESC R	ESC R
PF4	SS3 S	SS3 S	ESC S	ESC S *3

* ANSI mode applies to VT300 and VT100 modes. VT52 mode is not with ANSI mode.
*2 The last character in the sequence is a lowercase L.
*3 You cannot use these sequences on a VT52 terminal.
*4 Keypad numeric mode. "Enter" sends the same codes as "Return". You can use "line feed/new line mode (LNM)" to change the code sent by "Return". When LNM is reset, pressing "Return" sends one control character (CR). When LNM is set, pressing "Return" sends two control characters (CR,LF).

Codes Sent by the Top-Row Function Keys

Name	Code Sent		
	Key Number	VT300 modes	VT100, VT52 modes
Hold Screen	(F1)*1	—	—
Print Screen	(F2)*1	—	—
Set-Up	(F3)*1	—	—
F4	(F4)*1	—	—
Break	(F5)*1	—	—
F6	F6	CSI 1 7 ~	—
F7	F7	CSI 1 8 ~	—
F8	F8	CSI 1 9 ~	—
F9	F9	CSI 2 0 ~	—
F10	F10	CSI 2 1 ~	—
F11(ESC)	F11	CSI 2 3 ~	ESC
F12(BS)	F12	CSI 2 4 ~	BS
F13(LF)	F13	CSI 2 5 ~	LF
F14	F14	CSI 2 6 ~	—
Help	F15	CSI 2 8 ~	—
Do	F16	CSI 2 9 ~	—
F17	F17	CSI 3 1 ~	—
F18	F18	CSI 3 2 ~	—
F19	F19	CSI 3 3 ~	—
F20	F20	CSI 3 4 ~	—

*1 These keys do not send codes. They are local keys.

Keys Used to Send 7-Bit Control Codes

Control Character Mnemonic	Code Table Position	Key Pressed With "Ctrl" (All Mode)
NUL	0/00	2 or space bar
SOH	0/01	A
STX	0/02	B
ETX	0/03	C
EOT	0/04	D
ENQ	0/05	E
ACK	0/06	F
BEL	0/07	G
BS	0/08	H
HT	0/09	I or Tab
LF	0/10	J
VT	0/11	K
FF	0/12	L
CR	0/13	M
SO	0/14	N
SI	0/15	O *1
DLE	1/00	P
DC1	1/01	Q *2
DC2	1/02	R
DC3	1/03	S *2
DC4	1/04	T
NAK	1/05	U
SYN	1/06	V
ETB	1/07	W
CAN	1/08	X
EM	1/09	Y
SUB	1/10	Z
ESC	1/11	3 or [
FS	1/12	4 or \
GS	1/13	5 or]
RS	1/14	6 or ~
US	1/15	7 or ?
DEL	7/15	8

*1 The character is uppercase "o".
*2 The keys send codes only when XON/XOFF support is off.

C.3 EMULATING VT SERIES TERMINALS

Selecting an Operating Level (DECSCL)

NOTE

Select VT300 mode to run all VT200 applications.

Sequence	Level Selected
	< Level 1 >
CSI 6 1 " p	VT100 mode
	< Level 3 >
CSI 6 3 " p	VT300 mode, 8-bit controls
CSI 6 3 ; 0 " p	VT300 mode, 8-bit controls
CSI 6 3 ; 2 " p	VT300 mode, 8-bit controls
CSI 6 2 " p	VT300 mode, 8-bit controls
CSI 6 2 ; 0 " p	VT300 mode, 8-bit controls
CSI 6 2 ; 2 " p	VT300 mode, 8-bit controls
CSI 6 3 ; 1 " p	VT300 mode, 7-bit controls
CSI 6 2 ; 1 " p	VT300 mode, 7-bit controls

Sending C1 Controls to the Host

Sequence	Mnemonic	Function
ESC sp F	S7C1T	Select 7-bit
ESC sp G	S8C1T	Select 8-bit

NOTE: Available in VT300 mode only.

C.4 USING CHARACTER SETS

You can select the type of character set suited for your computing environment.

To use character sets,

1. Designate the set as G0, G1, G2, G3.
2. Map the designated set into the in-use table (GL, GR).

Default settings of character sets are as following,

G0 = ASCII
G1 = Special Graphics
G2 = Thai
G3 = Thai

G0 -> GL
G3 -> GR

Designating Character Sets (SCS Sequences)

SCS Sequence is as follows,

ESC Intermediate Final

Intermediate To select	Use	Final To Select	Use
< 94-Character Sets >		< 94-Character Sets >	
G0	(	ASCII	B
G1	)	Thai	&3
G2	*	DEC Special Graphic	0
G3	+	DEC Supplemental	% 5 *1
		User-Preference Supplemental	< *1
		DEC Technical	> *1
		DRCS	??? *1 *2
< 96-Character Set >		< 96-Character Sets >	
G1	-	ISO Latin-1 Supplemental	A *1
G2	.		
G3	/	DRCS	??? *1 *2

*1 Available in VT300 mode only.
*2 ??? is defined by user.

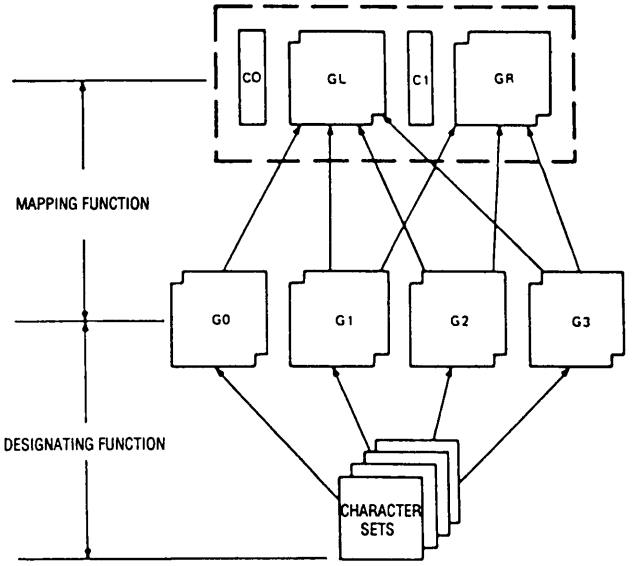


Figure Selection of Character Set

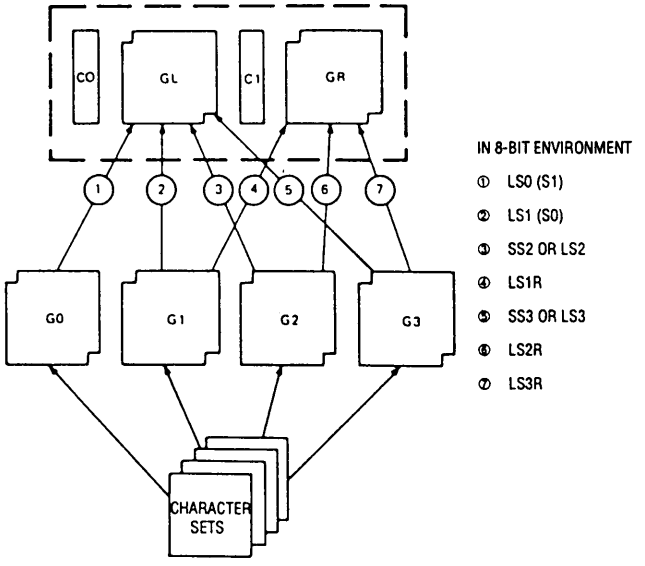


Figure Locking Shift and Single Shift

Mapping Character Sets

With Locking Shifts

Locking Shift	Code	Function
LS0 (locking shift 0)	SI	Map G0 into GL.
LS1 (locking shift 1)	SO	Map G1 into GL.
LS1R (locking shift 1, right)	ESC ~	Map G1 into GR. *
LS2 (locking shift 2)	ESC n	Map G2 into GL.
LS2R (locking shift 2, right)	ESC }	Map G2 into GR. *
LS3 (locking shift 3)	ESC o	Map G3 into GL.
LS3R (locking shift 3, right)	ESC |	Map G3 into GR. *

* Available in 8-bit environment only.

With Single Shifts

Single Shift	Code	Function
SS2(single shift 2)	ESC N	Maps G2 into GL for the next character.
SS3(single shift 3)	ESC O *	Maps G3 into GL for the next character.

* The last character is uppercase "o".

Assign User-Preference Supplemental Set (DECAUPSS)

Sequence	Function
DCS 0 ! u % 5 ST	Assigns the DEC Supplemental Graphic set as the preferred supplemental set.
DCS 1 ! u A ST	Assigns the ISO Latin-1 supplemental set as the preferred supplemental set.

NOTE: Available in VT300 mode only.

C.5 SOFT CHARACTER SETS

You can only load soft character sets in VT300 mode.

Down-Line-Loading a Soft Character Set (DECDLD)

DECDLD Sequence is as follows,

```
DCS Pfn ; Pcn ; Pe ; Pcmw ; Pw ; Pt ; Pcmh ; Pcss ; {
Dscs Sxbp1 ; Sxbp2 ;...; Sxbpn ST
```

DECDLD Parameter Characters

Parameter	Name	Description
Pfn	Font number	Selects the DRCS font buffer to load. The VT382 has one DRCS font buffer. Pfn has two valid values, 0 and 1. Both values refer to the same DRCS buffer.
Pcn	Starting character	Selects where to load the first character in the DRCS font buffer. The location corresponds to a location corresponds in the ASCII code table. Pcn is affected by the character set size. (See Pcss below.) In a 94-character set, a Pcn value of 0 or 1 means that the first soft character is loaded into position 2/1 of the character table. In a 96-character set, a Pcn value of 0 means the first character is loaded into position 2/0 of the character table. The greatest Pcn value is 95 (position 7/15).
Pe	Erase number	Selects which characters to erase from the DRCS buffer before loading the new font. 0 = erase all characters in the buffer with this number, width, and rendition. (Default) 1 = ease only characters in locations being reloaded. 2 = same as 0.
Pcmw	Character matrix width	Selects the maximum character cell width. 0 = 10 pixels wide (80 columns) (Default)

		6 pixels wide (132 columns) 1 = ignored. 2 = 5 x 10 (VT220/240 compatible) 3 = 6 x 10 (VT220/240 compatible) 4 = 7 x 10 (VT220/240 compatible) 5 = 5 pixels wide . . 12= 12 pixels wide Any Pcmw value over 12 is illegal.
Pw	Font width	Selects the number of columns per line (font set size). 0 = 80 columns.(Default) 1 = 80 columns. 2 = 132 columns.
Pt	Text or full-cell	Defines the font as a text font or full-cell font. 0 = text. (Default) 1 = text. 2 = full cell.
Pcmh	Character matrix height	Selects the maximum character cell height. 0 = 20 pixels high. (Default) 1 - 10 = 10 pixels high. 11 - 20 = 20 pixels high. 21 - 30 = 30 pixels high. If the value of Pcmw is 2 - 4, Pcmh is ignored.
Pcss	Character set size	Defines the character set as a 94- or 96-character graphic set. 0 = 94-character set. (Default) 1 = 96-character set.

NOTE: The value of Pcss changes the meaning of the Pcn (starting character) parameter above.

Dscs defines the character set name. You use this name in the select character set (SCS) escape sequence. You use the following format for the Dscs name

I I F

where

I I are zero to two intermediate characters, from the range 2/0 to 2/15 in the ASCII character set.

F is a final character in the range 3/0 to 7/14.

Sxbp1 ; Sxbp2 ;...; Sxbpn are the sixel bit patterns for individual characters, separated by semicolons (3/11). Your character set can have 1 to 94 patterns or 1 to 96 patterns, depending on the setting of the character set size parameter (Pcss). Each sixel bit pattern is in the following format.

S...S/S...S/S...

where

S...S represents the columns of sixels of the soft character.

/(2/5) advances the sixel pattern to the lower columns of the soft character.

Valid DECDLD Parameter Combinations

Pcmw	Pt	Pcmh
< 80-Column Fonts >		
0 to 10	0, 1	0 to 30
0 to 12	2	0 to 30
< 132-Column Fonts >		
0 to 6	0, 1	0 to 30
0 to 7	2	0 to 30

Clearing a Soft Character Set

You can clear a soft character set that you loaded into the terminal by using the following DECDLD control string.

DCS 1 ; 1 ; 2 { sp @ ST

Any of the following actions also clear the soft character set,
- — Turning the power off.
- — Selecting the "Default" or "Recall" features in the "Set-Up Directory".
- — Receiving the hard reset command (RIS).

C.6 SCREEN DISPLAY COMMANDS

Display Control Functions

Name	Mnemonic	Sequence
Send/receive mode	SRM	Set: CSI 1 2 h Local echo off. Reset: CSI 1 2 l * Local echo on.
Screen mode	DECSCNM	Set: CSI ? 5 h Light background. Reset: CSI ? 5 l * Dark background.
Scrolling mode	DECSCLM	Set: CSI ? 4 h Smooth scroll. Reset: CSI ? 4 l * Jump scroll.
Select active status display *2	DECSASD	CSI Ps $ } Ps = 0, main display. Ps = 1, host-writable 25th line.
Select status *2 display type	DECSSDT	CSI Ps $ ~ Ps = 0, none. Ps = 1, indicator. Ps = 2, host-writable.

* The last character in the sequence is a lowercase L.
*2 Available in VT300 mode only.

Display Set-Up sequence

Function	Mnemonic	Sequence
Control representation mode	CRM	Set: CSI 3 h Display controls. Reset: CSI 3 l * Interpret controls.
Sixel display mode	DECSDM	Set: CSI ? 8 0 h No Sixel scrolling Reset: CSI ? 8 0 l * Sixel scrolling

* The last character in the sequence is a lowercase L.

Format Sequences

Name	Mnemonic	Sequence
Column mode	DECCOLM	Set: CSI ? 3 h 132 columns. Reset: CSI ? 3 l * 80 columns.
Set top and bottom margins	DECSTBM	CSI Pt ; Pb r Pt = top line. (Default = 1) Pb = bottom line.(Default = 24)
Origin mode	DECOM	Set: CSI ? 6 h Move within margins. Reset: CSI ? 6 l * Move outside margins.

* The last character in the sequence is a lowercase L.

Additional Display Control Functions

Name	Mnemonic	Sequence
Thai Space Compensating mode	DECTHAISCM	Set: CSI ? 90 h Space Compensating mode. Reset: CSI ? 90 l * Normal Operating mode.

* The last character in the sequence is a lowercase L.

C.7 VISUAL CHARACTER AND LINE ATTRIBUTES

Character and Line Attribute Sequences

Name	Mnemonic	Sequence
Select graphic	SGR	CSI Ps; ... ;Ps m Ps = Character attribute value(s). (See list below.)
Single-width single-height line	DECSWL	ESC # 5
Double-width, single-height line	DECDWL	ESC # 6
Double-width, double-height line	DECDHL	ESC # 3(top half) ESC # 4(bottom half)

Visual Character Attribute Values

Ps	Attribute
< VT300 and VT100 Modes>	
0	All attributes off (Default)
1	Bold
4	Underline
5	Blinking
7	Reverse video
< VT300 Mode Only >	
22	Bold off
24	Underline
25	Blinking off
27	Reverse video off

C.8 EDITING

Inserting and Deleting Text

Name	Mnemonic	Sequence
Insert/replace	IRM	Set: CSI 4 h Insert characters. Reset: CSI 4 l * Replace characters.
Delete line	DL	CSI Pn M Pn lines. (Default = 1)
Insert line	IL	CSI Pn L Pn lines. (Default = 1)
Delete character	DCH	CSI Pn P Pn characters. (Default = 1)
Insert character *2	ICH	CSI Pn @ Pn characters. (Default = 1)

* The last character in the sequence is a lowercase L.
*2 Available in VT300 mode only.

Erasing Text

Name	Mnemonic	Sequence
Erase in display	ED	CSI Ps J Ps = 0, cursor to end. (Default) Ps = 1, beginning to cursor. Ps = 2, complete display.
Erase in line	EL	CSI Ps K Ps = 0, cursor to end. (Default) Ps = 1, beginning to cursor. Ps = 2, complete line.
Erase character *	ECH	CSI Pn X Pn characters. (Default = 1)

* Available in VT300 mode only.

Selectively Erasing Text

Name	Mnemonic	Sequence
Select character attribute *	DECSCA	CSI Ps " q Ps = 0, all attributes off. Ps = 1, not erasable by DECSEL, DECSED. Ps = 2, erasable by DECSEL, DECSED.
Selective erase in display *	DECSED	CSI ? Ps J Ps = 0, cursor to end. Ps = 1, beginning to cursor. Ps = 2, complete display.
Selective erase in line *	DECSEL	CSI ? Ps K Ps = 0, cursor to end. Ps = 1, beginning to cursor. Ps = 2, complete display.

* Available in VT300 mode only.

C.9 CONTROLLING THE CURSOR

Enabling the Cursor

Name	Mnemonic	Sequence
Text cursor enable mode	DECTCEM	Set: CSI ? 2 5 h Visible cursor. Reset: CSI ? 2 5 l * Invisible cursor.

* The last character in the sequence is a lowercase L.

Moving the Cursor

Name	Mnemonic	Sequence
Cursor position	CUP	CSI Pl ; Pc H Line Pl, column Pc.
Horizontal and vertical position	HVP	CSI Pl ; Pc f Line Pl, column Pc. Digital recommends use CUP instead.
Cursor forward	CUF	CSI Pn C Pn columns right.
Cursor backward	CUB	CSI Pn D Pn columns left.
Cursor up	CUU	CSI Pn A Pn lines up.
Cursor down	CUD	CSI Pn B Pn lines down.

* In these sequences, the default value for Pn, Pl, and Pc is 1.

Saving and Restoring the Cursor State

Function	Mnemonic	Sequence
Save cursor state	DECSC	ESC 7
Restore cursor state	DECRC	ESC 8

Mode of the Cursor

Name	Mnemonic	Sequence
Thai cursor mode	DECTHAICM	Set: CSI ? 5 0 h Internal cursor. Reset: CSI ? 5 0 l * Physical cursor.

* The last character in the sequence is a lowercase L.

C.10 KEYBOARD AND PRINTING COMMANDS

Keyboard Control Sequences

Mode	Mnemonic	Sequence Set	Reset
Keyboard action mode	KAM	CSI 2 h Locked.	CSI 2 l * Unlocked.
Line feed/ new line mode	LNM	CSI 2 0 h New line.	CSI 2 0 l * Line feed.
Autowrap mode	DECAWM	CSI ? 7 h Autowrap.	CSI ? 7 l * No autowrap.
Autorepeat mode	DECARM	CSI ? 8 h Repeat.	CSI ? 8 l * No repeat.
Cursor keys mode	DECCKM	CSI ? 1 h Application.	CSI ? 1 l * Cursor.
Keypad application	DECKPAM DECKPNM or DECNKM	ESC = Application CSI ? 6 6 h Application	ESC > Numeric. CSI ? 6 6 l * Numeric
Backarrow key	DECBKM	CSI ? 6 7 h Backspace	CSI ? 6 7 l * Delete
Thai input mode	DECTHAIM	CSI ? 4 9 h Thai input	CSI ? 4 9 l * English input

* The last character in the sequence is a lowercase L.

Programming UDKs (DECUDK)

You can only load soft character sets in VT300 mode.

Definable Keys

F6 through F14	Help
Do	F17 through F20

DECUDK Device Control String Format

DCS Pc ; Pl | Kyl / Stl ; ... Kyn / Stn ST

Parameter	Function
Pc	The clear parameter. 0 = Clear definition of all keys before loading new values. (Default) 1 = Clear definition of one key at a time, before loading a new value.
Pl	The lock parameter. 0 = Lock the keys to disable subsequent definition. (Default) 1 = Do not lock the keys to enable subsequent definition.
Kyl/Stl;...Kyn/Stn	The key definition strings. The key selector number (Kyn) indicates which key you are defining.

Key	Value	Key	Value	Key	Value
F6	17	F11	23	Do	29
F7	18	F12	24	F17	31
F8	19	F13	25	F18	32
F9	20	F14	26	F19	33
F10	21	Help	28	F20	34

Stn	The string parameters (Stn) are the key definitions, encoded as pairs of hex codes. 3/0 through 3/9 (0 through 9) 4/1 through 4/6 (A through F) 6/1 through 6/6 (a through f)

Printing Control Sequences

Name	Mnemonic	Sequence
Printer extent mode	DECPEX	Set: CSI ? 1 9 h Select whole screen. Reset: CSI ? 1 9 l * Select scrolling region only.
Print form feed mode	DECPFF	Set: CSI ? 1 8 h Send form feed at the end of printing. Reset: CSI ? 1 8 l * Send no form feed at the end of printing.
Auto print mode	MC	On: CSI ? 5 i Off: CSI ? 4 i
Printer controller mode	MC	On: CSI 5 i Off: CSI 4 i
Print screen	MC	CSI i or CSI 0 i
Print cursor line	MC	CSI ? 1 i
Transmission to host from printer port		CSI ? 8 i Disable. CSI ? 9 i Enable.

* The last character in the sequence is a lowercase L.

C.11 REPORTS

Sequences for VT382 Reports

Name	Mnemonic	Sequence
< Primary Device Attributes >		
Primary DA request (Host to VT382)	DA	CSI c or CSI 0 c
Primary DA response (VT382 to host)	DA	CSI ? Psc; Psl;...Psn c Psc: operating level. Psn: extensions.
(Examples)		
VT100 DA	ESC [? 1; 2 c	
VT101 DA	ESC [? 1; 0 c	
VT102 DA	ESC [? 6 c	
VT220 DA	CSI ? 62; 1; 2; 6; 7; 8; 9 c	
VT320 DA	CSI ? 63; 1; 2; 6; 7; 8 c	
VT382 DA	CSI ? 63; 1; 2; 4; 6; 7; 8; 15; 37 c	
< Secondary Device Attributes >		
Secondary DA request (Host to VT382)	DA	CSI > c or CSI > 0 c
Secondary DA response (VT382 to host)	DA	CSI > Pp; Pv; Po c Pp: identification code. 44 = VT382 terminal. Pv: firmware version. Po: hardware options. 0 = no options.

Device Status Reports

VT382 Operating Status

Function	Mnemonic	Sequence
Request (Host to VT382)	DSR	CSI 5 n
Report (VT382 to host)	DSR	CSI 0 n No malfunction. CSI 3 n Malfunction.

Cursor Position Report

Function	Mnemonic	Sequence
Request (Host to VT382)	DSR	CSI 6 n
Report (VT382 to host)	CPR	CSI Pl; Pc R Pl = line number. Pc = column number. If Pl and Pc are 0, the cursor is at the home position.

Printer Status

Function	Mnemonic	Sequence
Request (Host to VT382)	DSR	CSI ? 1 5 n
Report (VT382 to host)	DSR	CSI ? 1 3 n No printer. CSI ? 1 0 n Printer ready. CSI ? 1 1 n Printer not ready.

UDK Status (VT300 Mode Only)

Function	Mnemonic	Sequence
Request (Host to VT382)	DSR	CSI ? 2 5 n
Report (VT382 to host)	DSR	CSI ? 2 0 n UDKs unlocked. CSI ? 2 1 n UDKs locked.

Keyboard Dialect

Function	Mnemonic	Sequence
Request (Host to VT382)	DSR	CSI ? 2 6 n
Report (VT382 to host)	DSR	CSI ? 2 7 ; Pd n Pd = Keyboard dialect. 27 = Thai keyboard

Terminal State Reports (VT300 Mode Only)

Function	Mnemonic	Sequence
Request (Host to VT382)	DECRQTSR	CSI Ps $ u Ps: report requested. 0 = ignored. 1 = terminal state report.
Terminal state report (VT382 to host)	DECTSR	DCS 1 $ s D...D ST D...D = report data.
Restore terminal state	DECRSTS	DCS Ps $ p D...D ST Ps: data string format. 0 = error. 1 = terminal state report. D...D = restored data.

Presentation State Reports (VT300 Mode Only)

Function	Mnemonic	Sequence
Request (Host to VT382)	DECRQPSR	CSI Ps $ w Ps: report requested. 0 = error. 1 = cursor information report. 2 = tab stop report.
Cursor information (VT382 to host)	DECCIR	DCS 1 $ u D...D ST D...D = data string.
Tab stop report (VT382 to host)	DECTABSR	DCS 2 $ u D...D ST D...D =tab stops.
Restore presentation state	DECRSPS	DCS Ps $ t D...D ST Ps: data string format. 0 = error. 1 = cursor information report. 2 = tab stop report. D...D= data string.

Mode Settings

Function	Mnemonic	Sequence
Request mode *2 (Host to VT382)	DECRQM	CSI Pa $ p Pa = ANSI mode. (Table 1) CSI ? Pd $ p Pd = DEC private mode. (Table 2)
Report mode *2 (VT382 to host)	DECRPM	CSI Pa; Ps $ y Pa = ANSI mode. (Table 1) Ps: mode state. 0 = unknown mode. 1 = set. 2 = reset. 3 = permanently set. 4 = permanently reset. CSI ? Pd; Ps $ y Pd = DEC private mode. (Table 2) Ps: mode state. (Same as ANSI above.)
Set mode	SM	CSI Pa ; ... ; Pa h Pa = ANSI mode(s). (Table 1) CSI ? Pd ; ... ; Pd h Pd = DEC private mode(s). (Table 2)
Reset mode	RM	CSI Pa ; ... ; Pa l * Pa = ANSI mode(s). (Table 1) CSI ? Pd ; ... ; Pd l* Pd = DEC private mode(s). (Table 2)

* The last character in the sequence is a lowercase L.
*2 Available in VT300 mode only.

Table 1 ANSI Modes for DECRQM, DECRPM, SM and RM

Mode	Mnemonic	Pa	
Error		0	
Guarded area transfer mode	GATM	1	*
Keyboard action	KAM	2	
Control representation	CRM	3	
Insert/replace	IRM	4	
Status report transfer mode	SRTM	5	*
Erasure mode	ERM	6	*
Vertical editing mode	VEM	7	*
Horizontal editing	HEM	10	*
Positioning unit mode	PUM	11	*
Send/receive	SRM	12	
Format effector action mode	FEAM	13	*
Format effector transfer mode	FETM	14	*
Multiple area transfer mode	MATM	15	*
Transfer termination mode	TTM	16	*
Selected area transfer mode	SATM	17	*
Tabulation stop mode	TSM	18	*
Editing boundary mode	EBM	19	*
Line feed/new line	LNM	20	

* This function is report only. Can not set or reset.

Table 2 DEC private Modes for DECRQM, DECRPM, SM, and RM

Mode	Mnemonic	Pd
Error		0
Cursor keys	DECCKM	1
ANSI	DECANM	2
Column	DECCOLM	3
Scrolling	DECSCLM	4
Screen	DECSCNM	5
Origin	DECOM	6
Autowrap	DECAWM	7
Autorepeat	DECARM	8
Print form feed	DECPFF	18
Printer extent	DECPEX	19
Text cursor enable	DECTCEM	25
Thai input mode	DECTHAIM	49
Thai Cursor mode	DECTHAICM	50
Numeric keypad	DECNKM	66
Backarrow key	DECBKM	67
Sixel display mode	DECSDM	80
Thai Space Compensating mode	DECTHAISCM	90

Control Function Settings (VT300 Mode Only)

Function	Mnemonic	Sequence
Request (Host to VT382)	DECRQSS	DCS $ q D...D ST D...D= intermediate and/or final characters of function. (Table 3)
Report (VT382 to host)	DECRPSS	DCS Ps $ r D...D ST Ps = 0,unknown. Ps = 1,successful. D...D= intermediate and/or final characters of function. (Table 3)

Table 3 Control Functions for DECRQSS Requests

Control Function	Mnemonic	final Character(s)
Select active status display	DECSASD	$ }
Set character attribute	DECSCA	" q
Set conformance level	DECSCL	" p
Set status line type	DECSSDT	$ ~
Set top and bottom margins	DECSTBM	r
Select graphic rendition	SGR	m

User-Preference Supplemental Set (VT300 Mode)

Function	Mnemonic	Sequence
Request (Host to VT382)	DECRQUPSS	CSI & u
Report (VT382 to host)	DECAUPSS	DCS 0 ! u % 5 ST DEC Supplemental DCS 1 ! u A ST ISO Latin-1 supplemental

ANSI Conformance Levels (VT300 Mode)

Sequence	Function
ESC sp L	Select ANSI Conformance Level 1
ESC sp M	Select ANSI Conformance Level 2
ESC sp N	Select ANSI Conformance Level 3

C.12 SIXEL

The device control string for Sixel data is as follows.

DCS P1 ; P2 ; P3 ; q s...s ST

Parameter	Function
P1	The macro parameter that indicates the pixel aspect ratio. 0, 7, 8, 9 = 1:1 (Default) 1, 5, 6 = 2:1 2 = 5:1 3, 4 = 3:1
P2	Selects how the terminal draws the background color. 0, 2 = Set the current background color. (Default) 1 = Remain at their current color.
P3	Horizontal grid size parameter. VT382 ignores P3.
s...s	Sixel-encoded data string. Each Sixel data character represents as 3F to 7E.

Sixel Control Functions

Name	Function
Graphic repeat introducer	! Pn s Pn= repeat count. s = character to repeat.
Raster attributes	" Pan ; Pad ; Ph ; Pv Pan= numerator of pixel aspect ratio. Pad= denominator of pixel aspect ratio. Ph = horizontal size of image Pv = vertical size of image.
Graphic carriage return	$ Indicates the end of a Sixel line. The active position returns to the left border of same sixel line.
Graphics new line	- Indicates the end of a Sixel line. The active position moves to the left margin of the next Sixel line.

C.13 RESETTING AND TESTING

Resetting the Terminal

Name	Mnemonic	Sequence
Soft terminal reset *	DECSTR	CSI ! p
Hard terminal reset	RIS	ESC c Not recommended.
Tabulation clear	TBC	CSI 0 g Clear tab at cursor position. CSI 3 g Clear all tabs.

* Available in VT300 mode only.

Soft Terminal Reset(DECSTR) States

Mode	Mnemonic	State After DECSTR
Text cursor enable	DECTCEM	Cursor enabled.
Insert/replace	IRM	Replace.
Origin	DECOM	Absolute (cursor origin at upper-left of screen.)
Autowrap	DECAWM	No autowrap.
Keyboard action	KAM	Unlocked.
Numeric keypad	DECNKM	Numeric characters.
Cursor keys	DECCKM	Normal (arrow keys).
Set top and bottom	DECSTBM	Top margin = 1. Bottom margin = 24.
All character sets	SCS	VT382 default settings.
Select graphic rendition	SGR	Normal rendition.
Selective erase attribute	DECSCA	Normal (erasable by DECSEL and DECSED).
Save cursor state	DECSC	Home position with VT382 defaults.
Select active display	DECSASD	Main display (first 24 lines).

Effects of a Hard Terminal Reset(RIS)
- — Sets all features listed on Set-Up screens to their saved settings.
- — Causes a communication line disconnect and initialize.
- — Restores UDK from NVR.
- — Clears the soft character set.
- — Clears the screen.
- — Returns the cursor to the upper-left corner of the screen.
- — Sets the select graphic rendition (SGR) function to normal.
- — Sets the selective erase attribute (DECSCA) to erasable.
- — Selects the default character sets.

Testing the Terminal

Name	Mnemonic	Sequence
Invoke confidence test	DECTST	CSI 4; Ps; Ps; ... y
	Ps indicates a particular test to run.	
	Ps — Test to Run	
	0 — All tests (1,2,3,6)	
	1 — Power-up self-test	
	2 — RS232 port data loopback test	
	3 — Printer port loopback test	
	6 — RS232 port control line loopback test	
	7 — DEC423 port loopback test	
	9 — Repeat tests in the string.	
Screen alignment pattern	DECALN	ESC # 8

C.14 VT52 MODE CONTROL

Entering VT52 Mode (DECANM)

CSI ? 2 l (The last character in the sequence is a lowercase L.)

Exiting VT52 Mode

ESC <

VT52 Escape Sequences

Sequence	Action
ESC A	Cursor up.
ESC B	Cursor down.
ESC C	Cursor right.
ESC D	Cursor left.
ESC F	Enter graphics mode.
ESC G	Exit graphics mode.
ESC H	Cursor to home position.
ESC I	Reverse line feed.
ESC J	Erase from cursor to end of screen.
ESC K	Erase from cursor to end of line.
ESC Ylc *	Move cursor to direct cursor address.
ESC Z	Identify. (host to terminal)
ESC /Z	Report.(terminal to host)
ESC =	Enter alternate keypad mode.
ESC >	Exit alternate keypad mode.
ESC <	Exit VT52 mode. (Enter VT100 mode.)
ESC ^	Enter autoprint mode.
ESC _	Exit autoprint mode.
ESC W	Enter printer controller mode.
ESC X	Exit printer controller mode.
ESC]	Print screen.
ESC V	Print the line with the cursor.

* Line and column number for direct cursor address are single character codes whose value are the desired number plus 37(octal). Line and column numbers start at 1.

APPENDIX D

PRIMER OF THAI INPUT METHODS

D.1 THAI INPUT METHOD

D.1.1 Introduction

This chapter defines user interactions with VT382 and VT382 behavior in response to user action on its keyboard.

Most of the Thai alphabets, digits, and symbols defined in the TIS 620-2529 standard can be mapped directly to the keyboard layout. The characters which do not appear on top of keycaps can be entered by pressing the "Shift Thai" key sequence. These characters, KOR KWAUD, COR CON, LARK KANG, YAMAKKAN, FONGMAN, ANGKHANKHU, and KOMUT, entered by mean of these special key sequences, are not printed on VT382's keycap. (See Table D-3)

There are two input modes in VT382: Thai and English. Thai mode generates Thai (TIS 620-2529) code while English mode generates ASCII (ISO 646) code. VT382 uses the keyboard layout defined by the TIS 820-2531 standard to generate Thai code. Most of the Thai characters defined in the corresponding TIS 620-2529 standard can be mapped directly into the main keypad on the keyboard.

D.1.2 Invoking And Exiting Thai Input Mode

The Thai alphabetic characters and symbols can be entered through VT382 main key group (English alphabets, digits, and symbols). By switching the keyboard to the "Thai" mode, VT382 generates a different 8-bit code for

each key.

When VT382 is turned on (power-on), input mode is English ("Thai" LED is off).

Pressing the "Thai" key will make VT382 enter Thai mode ("Thai" LED ON). When VT382 is in Thai mode, it generates the Thai (TIS 620-2529) code. Pressing the "Thai" key again will make VT382 go back to English mode ("Thai LED OFF). In this mode, it generates the ASCII (ISO 646) code.

VT382 also change to Thai or English mode when it receives control function from the host. When either case occurs, the "Thai" LED is changed accordingly.

D.1.3 Thai Keyboard Modes

There are two modes of Thai keyboard input operation in VT382: the no input sequence check mode (NISC) mode, and the input sequence check (ISC) mode. This section describes detailed operations of both Thai keyboard modes. These modes do not affect English character entry.

Mode of Thai keyboard input operation can be selected by:

1. Choosing either NISC or ISC mode manually from SET-UP menu, or
2. Receiving control function from computer.

The factory default value for keyboard mode setting is the ISC mode. The user can change the Thai keyboard mode by choosing the desired mode from the SET-UP menu and store the setting by using SAVE command in the SET-UP menu.

D.1.3.1 No Input Sequence Check Mode

VT382 keyboard in the no input sequence check (NISC) mode allows the user to type any Thai or English character. When a valid keystroke or combination of keystrokes (i.e. control character, Thai compose character) is pressed, VT382 generates the corresponding character code. If keystroke is invalid, VT382 would ignore that keystroke.

D.1.3.2 Input Sequence Check Mode

In the input sequence check (ISC) mode, VT382 checks simple combinations of Thai character typed at the keyboard. Thai script column composition can be classified into 6 patterns: called Pattern A, B, C, D, E, and F. Certain combinations of keystroke do not produce correct Thai script writing syntax. Therefore, VT382 provides the ISC mode to help users preventing possible typo error when performing data entry in Thai.

Combinations of all six patterns are shown below:

Basic Patterns on Thai Character Column Composition

Pattern	A	B	C	D	E	F
Level 1	-	Y	-	-	Y	Y
Level 2	-	-	Y	-	Y	-
Level 3	Y	Y	Y	Y	Y	Y
Level 4	-	-	-	Y	-	Y

In the ISC mode, VT382 does not allow the following cases:

1. Level 1, 2, or 4 characters cannot follow level 3 character which has "impossible" character composibility (refer to Table D-1 for the composibility of each character).
2. Level 1 and level 4 characters cannot immediately follow the MAI TAIKOO character unless there is one or more level 3 character in between.
3. Level 2 characters cannot immediately follow a level 4 character unless there is one or more level 3 character in between.
4. Level 4 characters cannot immediately follow a level 2 character unless there is one or more level 3 character in between.

If the case mentioned above occurs or VT382 cannot generate the code according to Table D-2 and D-3, it would ignore that keystroke and no code is produced.

In the ISC mode, VT382 allows control codes, DELETE key code, function key codes, cursor key's codes, keypad codes, and codes generated by Hexadecimal code entry mode, to be sent out at communication port without input sequence checking. After sending any of these codes, VT382 would

not check keystroke sequence until it finds next printable ASCII or level 3 Thai character.

If the application software cannot accept this checking mechanism, it is advised that the application should choose the NISC mode, instead.

D.1.3.3 Selecting The Mode Of Thai Keyboard Input Operation

The factory default setting for VT382 is the Input Sequence Check (ISC) mode. The intention for this mode is to add simple keyboard sequence check in order to prevent possible typo in Thai language entry.

The ISC mode can be disabled by performing the following steps:

1. Enter SET-UP menu (pressing F3 key),
2. Select Keyboard SET-UP menu,
3. Toggle Input Sequence Check entry to No Input Sequence Check entry

The ISC mode can be selected again by performing the following steps:

1. Enter SET-UP menu (pressing F3 key),
2. Select Keyboard SET-UP menu,
3. Toggle No Input Sequence Check entry to Input Sequence Check entry

D.2 THAI OUTPUT METHOD

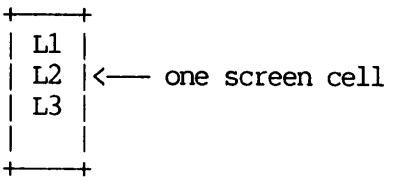
D.2.1 Introduction

This chapter describes output methodologies in VT382 terminal. In general, VT382 has two output destinations: screen and printer port. This chapter is intended to describe how VT382 display and print Thai/English texts on these output destinations.

D.2.2 Screen Output

This section describes the behavior of VT382 when it receives output stream from computer.

Usually normal software written for English application handles one byte as a one character which will occupy one screen cell. The major problem concerned with writing Thai on output devices is one character of information might not take one column on output device. For example, if VT382 receives three Thai character stream of {L3 L2 L1}, it might display this character stream in one screen cell.



In this case, one screen cell contains three characters while software, sending out three characters, might thought that it takes three screen cells (columns) on VT382 screen.

Therefore, with respect to writing Thai on terminal screen, application software can be classified into two categories and two VT382 screen output modes(normal mode/space compensating mode) are provided for each category.

1. First group of these software is those which format screen output in a non-table output fashion. Text editors, word processors, to name a few, are some examples of this type of application. Text processing application normally formats its output line internally and sends it out to output device by assuming one character would occupy one column on output device, which is not

true in writing Thai.

Therefore, if this type of application will be used with Thai characters, it must know how to count output column in Thai script writing correctly. Hence, software application in this category must be tailored made or modified specifically to handle Thai language. VT382 provides an as is output mode to use with this type of application, called the Normal Operating Mode (NOM).

2. The other type of application does not format its output line or writes its formatted output line in a table-like format. Examples of this type of application are: database management package, spreadsheet, form design and management package, application software written in FORTRAN, etc.

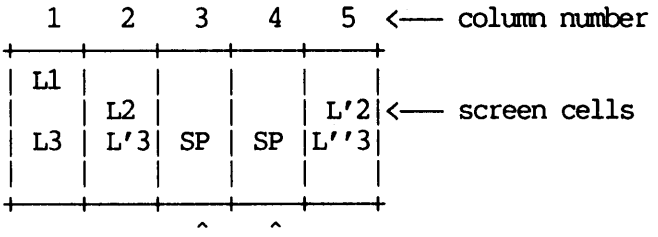
   This type of application may not need modification to handle Thai characters if:

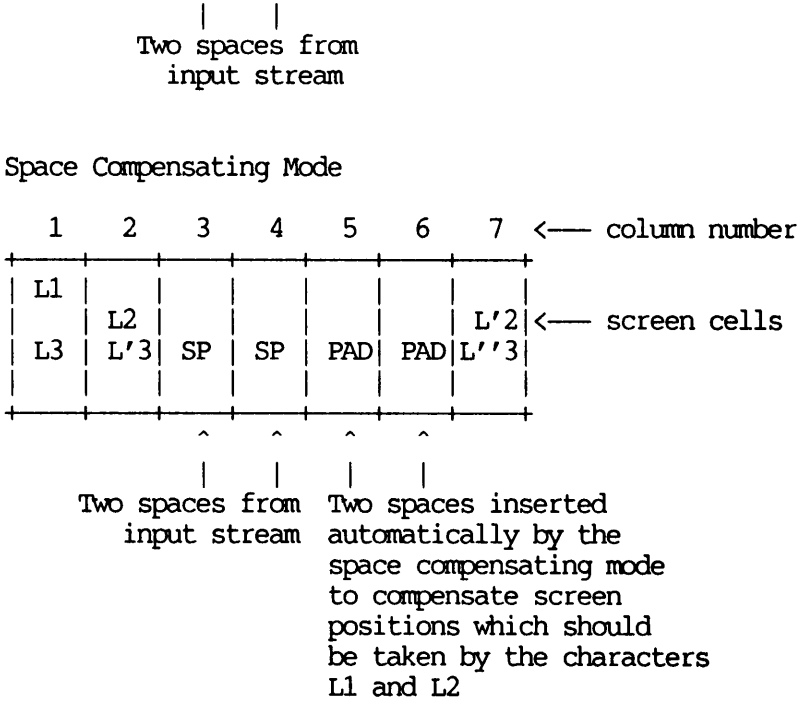
   1. The software can accept and send out 8-bit characters, and
   2. User can adjust screen output format to have at least two consecutive spaces between each field on each line.

For example, to display a spreadsheet output correctly, user must insert a blank column with a minimum width of 2 screen columns in the sheet. When VT382 receives two consecutive spaces, it would automatically write the next received character on the column which has the column number equal to the sum of characters on the left of current cursor position. This mode of output processing is called the Space Compensating Mode (SCM).

Suppose VT382 has received a Thai character stream of {L3 L1 L'3 L2 SP SP L''3 L'2}, then it would display this character stream like this.

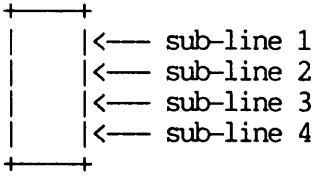
Normal Operating Mode





D.2.2.1 Thai Character Display

One line of Thai script consists of four sub-lines. These sub-lines are called writing level 1, 2, 3, and 4. In VT382, one screen cell is divided into four sub-lines as well.



Each of Thai characters has its own fixed writing level property attached to. The writing level property determines the position (sub-line) which that character will be written in a screen cell. For example, Thai character which has the writing property of level 2 would be written into a screen cell at sub-line 2. English characters and symbols are always

written at sub-line 3.

The following table summarizes binary representation of the Thai character set defined by the TIS 620-2529 standard along with basic character attributes. The columns of Table D-1 are explained below.

TIS Code (Dec Hex) — The character code based on TIS 620-2529 (1986). The first column is in decimal and the second hexadecimal.

Name — The name of the character according to pronunciation. For exact definition, please refer to the TIS 620-2529 standard.

Writing Level — The Thai "sub-line levels" are numbered 1 through 4. "1" is the highest position in a single character cell, "4" the lowest. Sub-line level "3" is referred to as the "base level".

Column Compose — The VT382's Thai script writing methods splits the usage of every Thai character into one of the three composition placement categories (possible, impossible, and must).

"Possible" means that this base line (level 3) character can have level 1, 2 or 4 added to its character cell.

"Impossible" means the character is a base line (level 3) character only. It can not have any other characters above or below it (i.e., in sub-lines 1, 2, or 4).

"Must" means the character is placed in sub-levels 1, 2, or 4; and correct syntax implies it does not follow a "impossible". If an attempt is made at composing this type of incorrect Thai script writing syntax the "must" character is not placed in a sub-level of the "impossible" base character's cell. It is placed in the next character cell which has a "blank" base line character. This displays the Thai syntax error to the user.

Table D-1 Thai Character Attribute Table

TIS Code Dec	Hex	Name	Writing Level	Column Compose
161	A1	GOR KAI	3	possible
162	A2	KOR KHAI	3	possible
163	A3	KOR KWAUD	3	possible
164	A4	COR KWAI	3	possible
165	A5	COR CON	3	possible
166	A6	COR RAKANG	3	possible
167	A7	NG NGOO	3	possible
168	A8	JAW CHARN	3	possible
169	A9	CHOR CHING	3	possible
170	AA	CHOR CHARNG	3	possible
171	AB	ZHOR ZHO	3	possible
172	AC	CHOR KACHER	3	possible
173	AD	YOR YING	3	possible
174	AE	DOR CHADAR	3	possible
175	AF	THOR PATHUK	3	possible
176	B0	TOR TARN	3	possible
177	B1	TOR NANGMONDTHO	3	possible
178	B2	TOR POOTHAOU	3	possible
179	B3	NOR NEND	3	possible
180	B4	DOR DEK	3	possible
181	B5	THOR TOU	3	possible
182	B6	TOR THUNG	3	possible
183	B7	TOR TANHARN	3	possible
184	B8	TOR THONG	3	possible
185	B9	NOR NOO	3	possible
186	BA	BOR BIMAI	3	possible
187	BB	POR PLA	3	possible
188	BC	POR POUNG	3	possible
189	BD	PHOR PHAH	3	possible
190	BE	POR PARN	3	possible
191	BF	FOR FUN	3	possible
192	C0	POR SUMPAOU	3	possible
193	C1	MOR MA	3	possible
194	C2	YOR YAK	3	possible
195	C3	ROR RUER	3	possible

Table D-1 Thai Character Attribute Table (Cont)

TIS Code Dec	Hex	Name	Writing Level	Column Compose
196	C4	ROR RUE	3	impossible
197	C5	LOR LING	3	possible
198	C6	LOR LUE	3	impossible
199	C7	WOH WAN	3	possible
200	C8	SOR SALAN	3	possible
201	C9	SOR RUESEE	3	possible
202	CA	SOR SUE	3	possible
203	CB	HOR HEEP	3	possible
204	CC	LOR JULAN	3	possible
205	CD	OR ARNG	3	possible
206	CE	HOR NOKHOOKE	3	possible
207	CF	PAI YARN NOI	3	impossible
208	D0	SARA A	3	impossible
209	D1	MAI HUNARKARD	2	must
210	D2	SARA AR	3	impossible
211	D3	SARA UM	3	impossible
212	D4	SARA AI	2	must
213	D5	SARA AIE	2	must
214	D6	SARA UH	2	must
215	D7	SARA OU	2	must
216	D8	SARA U	4	must
217	D9	SARA UU	4	must
218	DA	PHINTHU	4	must
223	DF	BAHT SIGN	3	impossible
224	E0	SARA AE	3	impossible
225	E1	SARA AIR	3	impossible
226	E2	SARA O	3	impossible
227	E3	SARA AIMAIMUAN	3	impossible
228	E4	SARA AIMAIMALAI	3	impossible
229	E5	LARK KANG	3	impossible
230	E6	YAMOK	3	impossible

Table D-1 Thai Character Attribute Table (Cont)

TIS Code Dec	Hex	Name	Writing Level	Column Compose
231	E7	MAI TAIKOO	2	must
232	E8	MAI EK	1	must
233	E9	MAI TOH	1	must
234	EA	MAI TREE	1	must
235	EB	MAI JUDTAWA	1	must
236	EC	KARRUN	1	must
237	ED	NIKKHAHIT	2	must
238	EE	YAMAKKAN	3	impossible
239	EF	FONGMAN	3	impossible
240	F0	Thai digit zero	3	impossible
241	F1	Thai digit one	3	impossible
242	F2	Thai digit two	3	impossible
243	F3	Thai digit three	3	impossible
244	F4	Thai digit four	3	impossible
245	F5	Thai digit five	3	impossible
246	F6	Thai digit six	3	impossible
247	F7	Thai digit seven	3	impossible
248	F8	Thai digit eight	3	impossible
249	F9	Thai digit nine	3	impossible
250	FA	ANGKHANKHU	3	impossible
251	FB	KOMUT	3	impossible

1. All English characters and symbols have writing level 3 and impossible character composibility.
2. The level 2 character E7 [MAI TAIKOO] cannot be composed with any level 1, 2, or 4 character.

Verbally, the rules to write characters on VT382 screen can be summarized as follows:

1. Characters with Level 3 properties are written on the base line (sub-line 3) of the screen cell. The base line is the same line on which English characters and symbols are written.

2. Characters with Level 2 properties are written immediately above the preceding Level 3 characters.

   There are four exceptional cases that require special processing:

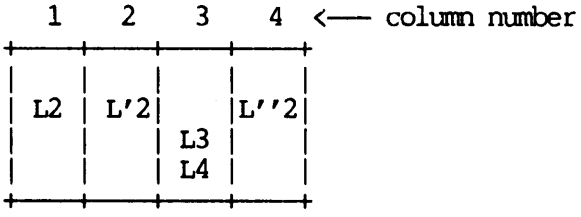
1. If the cursor is located at the column 1, VT382 writes the Level 2 character on column 1.
2. If the Level 3 character in the preceding column has impossible character composibility, the Level 2 character is written on current screen column.
3. If the preceding column has Level 2 character in place, VT382 writes the new Level 2 character on the current screen column.
4. The Level 2 and Level 4 characters are mutually exclusive in a screen cell. If the preceding screen column contains a Level 4 character, the new Level 2 character is written on the current screen column.

3. Level 1 characters are written on the highest sub-line (Level 1). These characters are written above Level 2 characters, if any. In the absence of Level 2 character in the preceding column, the Level 1 character is written in Level 2 position instead. All exceptional cases of Level 1 characters are similar to those of Level 2 described above.

4. Level 4 characters are written below the base level. All screen update rules and exceptional cases for Level 2 characters are also applied to Level 4 characters.

5. All characters defined in the ISO 646 standard are treated as Level 3 characters. All of them have the impossible character composibility. In the other words, no other character can combine with them.

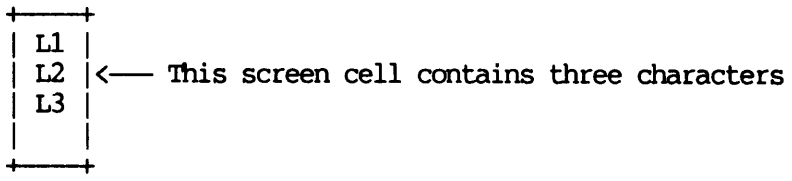
VT382 tries its best to write Thai characters according to the rules described above. However, if it receives impossible composition of Thai character stream, VT382 writes each character that breaks the rules into a new screen cell. In this case, the character stream is invalid in Thai. For example, if VT382 has received a character stream of {L2 L'2 L3 L4 L''2}, VT382 would know that the sequence {L2} follow by {L'2} and the sequence {L4} follow by {L''2} are invalid in Thai. It would then write the characters {L'2} and {L''2} in a new screen cell as follow.



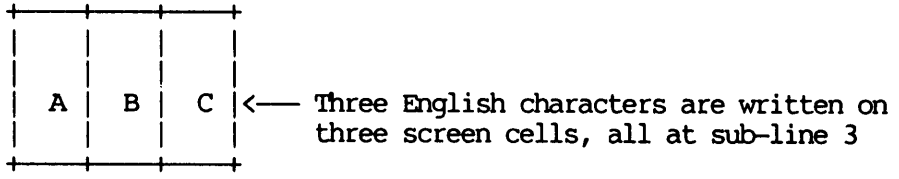
D.2.2.2 Normal Operating Mode

The Normal Operating Mode (NOM) writes Thai characters at appropriate sub-line position. When VT382 is operated in this mode, the screen containing no TIS 620-2529 Thai code would look exactly the same as the screen appearance on other Digital VT300 Series terminals. The NOM mode is the default operating mode when VT382 is turn on.

Under Normal Operating Mode, if VT382 has received a three Thai character stream of {L3 L2 L1}, it would display the output on the screen as:



If it has received a three English character stream of {A B C}, screen output would become:



D.2.2.3 Space Compensating Mode

The Space Compensating Mode (SCM) provides further processing to character stream which VT382 receives at its communication port. This mode is designed to add basic Thai processing capability to software applications

without the needs of software modification. This added capability is provided subject to two conditions:

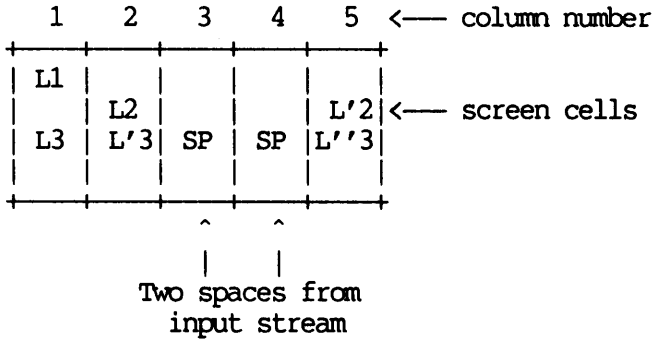
1. The software must be able to accept and send out 8-bit codes, and
2. User of that software must be able to insert at least two blank (space) characters into the output stream to delimit each information field on the output line.

Under this mode, if there is two or more consecutive space on the line, the next printable character on that line would be shifted to the right. The actual physical column of that next printable character is equal to the total number of all received characters to the left of that character.

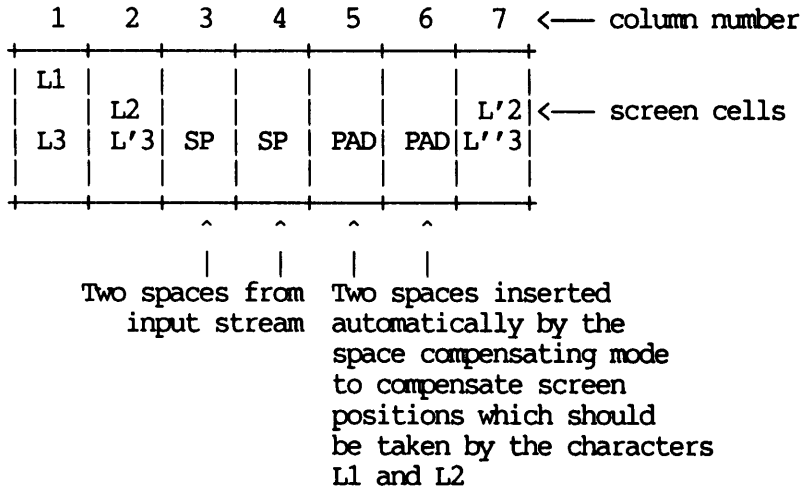
VT382 implements this mechanism by inserting "phantom" space entry into its screen. These phantom spaces are not received at the communication port but VT382 automatically inserts them on the screen.

Suppose VT382 has received a Thai character stream of {L3 L1 L'3 L2 SP SP L''3 L'2}, then it would display this character stream like this.

Normal Operating Mode



Space Compensating Mode



If the screen VT382 contains no TIS 620-2529 Thai character, its appearance would look exactly the same as other Digital's VT300 family terminals.

D.2.2.4 Choosing Screen Output Mode

Digital recommends that screen output mode should be set by the one who installs application software and/or application software itself. Automatic selection of screen output mode can be made through the use of

escape sequences. If the application software has not been tested and suggested to use the Space Compensating Mode (SCM), it is advised that that application software use the Normal Operating Mode (NOM).

The power-on setting for VT382 is the Normal Operating Mode (NOM) which is the standard operating mode on all other Digital's terminal. The Space Compensating Mode (SCM) is provided for the user of VT382 in case the user wants to use unmodified English application software (under some conditions) with Thai data.

VT382's screen output mode can be selected automatically by sending appropriate control function to VT382. Please refer to the VT382 Programmer Reference Manual (order code EK-VT38T-RM) for more details.

The Space Compensating Mode can be selected manually by performing the following steps:

1. Enter SET-UP menu (pressing F3 key),
2. Select Screen SET-UP menu,
3. Toggle Normal Operating Mode entry to Space Compensating Mode entry

The Normal Operating Mode can be selected by performing the following steps:

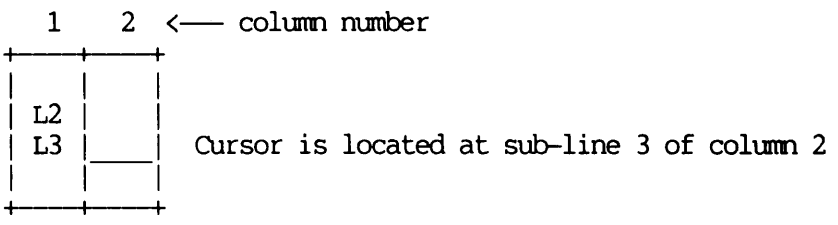
1. Enter SET-UP menu (pressing F3 key),
2. Select Keyboard SET-UP menu,
3. Toggle Space Compensating Mode entry to Normal Operating Mode entry

D.2.2.5 Cursor Operation

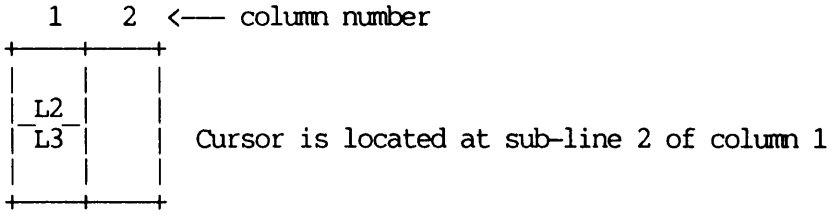
VT382 provides two mode of cursor operation.

1. Logical Cursor Mode allow the movement of cursor between sub-lines of screen cell. Under the normal circumstance, individual character in each screen cell can be addressed during editing by using cursor left/cursor right keys.

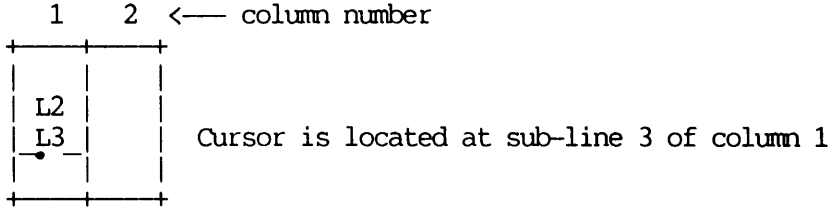
If the original screen is;



When pressing left cursor key once, the screen would become;

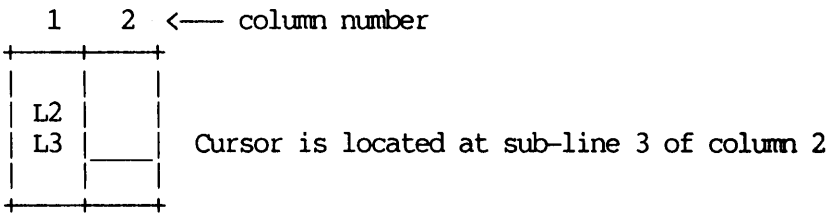


When pressing left cursor key once again, the screen would look like;

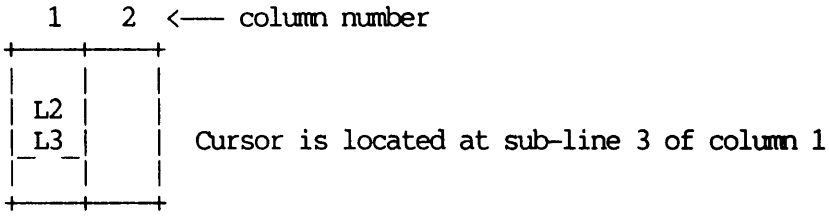


2. Physical Cursor Mode allow the cursor to be moved on sub-line 3 of screen cell. Under the normal circumstance, only character written on sub-line 3 of each screen cell can be addressed during editing.

If the original screen is;



When pressing left cursor key once, the screen would look like;



D.2.3 Attached Printer Output

This section describes the behavior of printer port of VT382.

Considering the order of the codes sent to the printer, there are two types of order of codes sent from VT382; one for printer with built-in intelligence, and the other for dumb printer. The order of codes sent to different types of attached printer are different.

D.2.3.1 Output For Intelligent Printer

The term intelligent printer here implies that the printer has built-in intelligence to write Thai characters to their appropriate positions on the print line without VT382 intervention.

D.2.3.2 Output For Dumb Printer

Dumb printer does not have the capability to print Level 1, Level 2, and Level 4 characters into their proper positions. Therefore, VT382 provides text stream formatting to the printer data before output is sent out to the printer.

D.2.3.3 Choosing Printer Output Mode

VT382 has two Thai specific entries in the Printer SET-UP menu. These entries define the Thai support features of VT382's attached printer. The first entry defines whether the attached printer has Thai language support or not. The other entry defines whether the attached printer supports the TIS character stream code (with the ability to print each character at its appropriate position) or not.

The factory settings for these Printer SET-UP entries are;

1. ASCII/Thai, and

2. Dumb Printer

Both entries can be changed and/or saved by choosing the SAVE command in the SET-UP menu.

D.3 CODE GENERATED BY KEYBOARD

The table Table D-2 shows the relationship among generated code, mode of input, and keystroke on VT382. Keystrokes shown in the table are actual keystrokes typed on the keyboard. English mode key names are used to identify keystroke sequences.

Table D-2: Keyboard Generated Code

Generated Code (Dec/Hex)	Mode	Keystroke
000/00	Thai/English	<Ctrl><SPACE>
001/01	Thai/English	<Ctrl><A>
002/02	Thai/English	<Ctrl><B>
003/03	Thai/English	<Ctrl><C>
004/04	Thai/English	<Ctrl><D>
005/05	Thai/English	<Ctrl><E>
006/06	Thai/English	<Ctrl><F>
007/07	Thai/English	<Ctrl><G>
008/08	Thai/English	<Ctrl><H>
009/09	Thai/English	<TAB>
009/09	Thai/English	<Ctrl><I>
010/0A	Thai/English	<Ctrl><J>
011/0B	Thai/English	<Ctrl><K>
012/0C	Thai/English	<Ctrl><L>
013/0D	Thai/English	<RETURN>
	Thai/English	<Ctrl><M>
014/0E	Thai/English	<Ctrl><N>
015/0F	Thai/English	<Ctrl><O>
016/10	Thai/English	<Ctrl><P>
017/11	Thai/English	<Ctrl><Q>
018/12	Thai/English	<Ctrl><R>
019/13	Thai/English	<Ctrl><S>
020/14	Thai/English	<Ctrl><T>
021/15	Thai/English	<Ctrl><U>
022/16	Thai/English	<Ctrl><V>
023/17	Thai/English	<Ctrl><W>
024/18	Thai/English	<Ctrl><X>
025/19	Thai/English	<Ctrl><Y>
026/1A	Thai/English	<Ctrl><Z>
027/1B	Thai/English	<Ctrl><[>
028/1C	Thai/English	<Ctrl><\>

029/1D	Thai/English	<Ctrl><]>
030/1E	Thai/English	<Ctrl><^>
031/1F	Thai/English	<Ctrl><_>
032/20	Thai/English	<SPACE>
033/21	English	<!>
034/22	English	<">
	Thai	<W>
035/23	English	<#>
	Thai	<>
036/24	English	<$>
037/25	English	<%>
	Thai	<|>
038/26	English	<&>
039/27	English	<'>
040/28	English	<(>
	Thai	<Z>
041/29	English	<)>
	Thai	<X>
042/2A	English	<*>
	Thai	<~>
043/2B	English	<+>
	Thai	<1>
044/2C	English	<,>
	Thai	<}>
045/2D	English	<->
	Thai	<\>
046/2E	English	<.>
	Thai	<">
047/2F	English	</>
	Thai	<2>
048/30	English	<0>
049/31	English	<1>
050/32	English	<2>
051/33	English	<3>
052/34	English	<4>
053/35	English	<5>
054/36	English	<6>
055/37	English	<7>
056/38	English	<8>
057/39	English	<9>
058/3A	English	<:>
	Thai	<<>
059/3B	English	<;>
060/3C	English	<<>
061/3D	English	<=>

	Thai	<'>
062/3E	English	<>
063/3F	English	<?>
	Thai	<M>
064/40	English	<@>
065/41	English	<A>
066/42	English	<B>
067/43	English	<C>
068/44	English	<D>
069/45	English	<E>
070/46	English	<F>
071/47	English	<G>
072/48	English	<H>
073/49	English	<I>
074/4A	English	<J>
075/4B	English	<K>
076/4C	English	<L>
077/4D	English	<M>
078/4E	English	<N>
079/4F	English	<O>
080/50	English	<P>
081/51	English	<Q>
082/52	English	<R>
083/53	English	<S>
084/54	English	<T>
085/55	English	<U>
086/56	English	<V>
087/57	English	<W>
088/58	English	<X>
089/59	English	<Y>
090/5A	English	<Z>
091/5B	English	<[>
092/5C	English	<\>
093/5D	English	<]>
094/5E	English	<^>
095/5F	English	<_>
	Thai	<3̄>
096/60	English	<'>
097/61	English	<a>
098/62	English	<b>
099/63	English	<c>
100/64	English	<d>
101/65	English	<e>
102/66	English	<f>
103/67	English	<g>

104/68	English	<h>
105/69	English	<i>
106/6A	English	<j>
107/6B	English	<k>
108/6C	English	<l>
109/6D	English	<m>
110/6E	English	<n>
111/6F	English	<o>
112/70	English	<p>
113/71	English	<q>
114/72	English	<r>
115/73	English	<s>
116/74	English	<t>
117/75	English	<u>
118/76	English	<v>
119/77	English	<w>
120/78	English	<x>
121/79	English	<y>
122/7A	English	<z>
123/7B	English	<{>
124/7C	English	<|>
125/7D	English	<}>
126/7E	English	<~>
127/7F	Thai/English	<DEL>
128/80	-	No key assigned to this code
129/81	-	No key assigned to this code
130/82	-	No key assigned to this code
131/83	-	No key assigned to this code
132/84	-	No key assigned to this code
133/85	-	No key assigned to this code
134/86	-	No key assigned to this code
135/87	-	No key assigned to this code
136/88	-	No key assigned to this code
137/89	-	No key assigned to this code
138/8A	-	No key assigned to this code
139/8B	-	No key assigned to this code
140/8C	-	No key assigned to this code
141/8D	-	No key assigned to this code
142/8E	-	No key assigned to this code
143/8F	-	No key assigned to this code
144/90	-	No key assigned to this code
145/91	-	No key assigned to this code
146/92	-	No key assigned to this code
147/93	-	No key assigned to this code
148/94	-	No key assigned to this code

149/95	-	No key assigned to this code
150/96	-	No key assigned to this code
151/97	-	No key assigned to this code
152/98	-	No key assigned to this code
153/99	-	No key assigned to this code
154/9A	-	No key assigned to this code
155/9B	-	No key assigned to this code
156/9C	-	No key assigned to this code
157/9D	-	No key assigned to this code
158/9E	-	No key assigned to this code
159/9F	-	No key assigned to this code
160/A0	-	No key assigned to this code
161/A1	Thai	<d>
162/A2	Thai	<->
163/A3	Thai	<Shift><Thai><->
164/A4	Thai	<8>
165/A5	Thai	<Shift><Thai><8>
166/A6	Thai	<S>
167/A7	Thai	<'>
168/A8	Thai	<0>
169/A9	Thai	<C>
170/AA	Thai	<=>
171/AB	Thai	<:>
172/AC	Thai	<G>
173/AD	Thai	<P>
174/AE	Thai	<E>
175/AF	Thai	<D>
176/B0	Thai	<{>
177/B1	Thai	<R>
178/B2	Thai	Shifted <,>
179/B3	Thai	<I>
180/B4	Thai	<f>
181/B5	Thai	<9>
182/B6	Thai	<5>
183/B7	Thai	<m>
184/B8	Thai	<T>
185/B9	Thai	<o>
186/BA	Thai	<[>
187/BB	Thai	<x>
188/BC	Thai	<z>
189/BD	Thai	</>
190/BE	Thai	<r>
191/BF	Thai	<a>
192/C0	Thai	<4>
193/C1	Thai	Unshifted <,>

194/C2	Thai	<p>
195/C3	Thai	<i>
196/C4	Thai	<A>
197/C5	Thai	<]>
198/C6	Thai	<?>
199/C7	Thai	<;>
200/C8	Thai	<L>
201/C9	Thai	<K>
202/CA	Thai	<l>
203/CB	Thai	<s>
204/CC	Thai	Shifted <.>
205/CD	Thai	<v>
206/CE	Thai	<V>
207/CF	Thai	<O>
208/D0	Thai	<t>
209/D1	Thai	<y>
210/D2	Thai	<k>
211/D3	Thai	<e>
212/D4	Thai	<b>
213/D5	Thai	<u>
214/D6	Thai	<7>
215/D7	Thai	<n>
216/D8	Thai	<6>
217/D9	Thai	<^>
218/DA	Thai	<B>
219/DB	-	No key assigned to this code
220/DC	-	No key assigned to this code
221/DD	-	No key assigned to this code
222/DE	-	No key assigned to this code
223/DF	Thai	<!>
224/E0	Thai	<g>
225/E1	Thai	<c>
226/E2	Thai	<F>
227/E3	Thai	Unshifted <.>
228/E4	Thai	<w>
229/E5	Thai	<Shift><Thai><k>
230/E6	Thai	<q>
231/E7	Thai	<H>
232/E8	Thai	<j>
233/E9	Thai	<h>
234/EA	Thai	<U>
235/EB	Thai	<J>
236/EC	Thai	<N>
237/ED	Thai	<Y>
238/EE	Thai	<Shift><Thai><e>

239/EF	Thai	<Shift><Thai><q>
240/F0	Thai	<Q>
241/F1	Thai	<@>
242/F2	Thai	<#>
243/F3	Thai	<$>
244/F4	Thai	<%>
245/F5	Thai	<*>
246/F6	Thai	<(>
247/F7	Thai	<)>
248/F8	Thai	<_>
249/F9	Thai	<+>
250/FA	Thai	<Shift><Thai><o>
251/FB	Thai	<Shift><Thai><z>
252/FC	-	No key assigned to this code
253/FD	-	No key assigned to this code
254/FE	-	No key assigned to this code
255/FF	-	No key assigned to this code

D.4 KEYBOARD CODE CROSS REFERENCE

The Table D-3 shows the relationship among generated code, mode of input, and keystroke on VT382

The Control column refers to binary codes generated when each corresponding key is pressed while the <Ctrl> key is pressed.

The Thai Compose column refers to binary codes generated when each corresponding key is pressed while the <Shift> and the <Thai> keys are pressed.

Table D-3: Generated Code Cross Reference Table

	Generated Code in Hexadecimal					
		English		Thai		
Key Name	Control	Normal	Shift	Normal	Shift	Thai Compose
<'>|<~>	No Code	60	7E	3D	2A	No Code
<1>|<!>	No Code	31	21	2B	DF	No Code
<2>|<@>	No Code	32	40	2F	F1	No Code
<3>|<#>	No Code	33	23	5F	F2	No Code
<4>|<$>	No Code	34	24	C0	F3	No Code
<5>|<%>	No Code	35	25	B6	F4	No Code
<6>|<^>	No Code	36	5E	D8	D9	No Code
<7>|<&>	No Code	37	26	D6	D1, E9	No Code
<8>|<*>	No Code	38	2A	A4	F5	A5
<9>|<(>	No Code	39	28	B5	F6	No Code
<0>|<)>	No Code	30	29	A8	F7	No Code
<->|<_>	No Code	2D	5F	A2	F8	A3
<=>|<+>	No Code	3D	2B	AA	F9	No Code
<DEL>	No Code	7F	7F	7F	7F	No Code
<TAB>	No Code	09	09	09	09	No Code
<q>|<Q>	11	71	51	E6	F0	EF
<w>|<W>	17	77	57	E4	22	No Code
<e>|<E>	05	65	45	D3	AE	EE
<r>|<R>	12	72	52	BE	B1	No Code
<t>|<T>	14	74	54	D0	B8	No Code
<y>|<Y>	19	79	59	D1	ED	No Code
<u>|<U>	15	75	55	D5	EA	No Code
<i>|<I>	09	69	49	C3	B3	No Code
<o>|<O>	0F	6F	4F	B9	CF	FA

<p>|<P>	10	70	50	C2	AD	No Code
<[>|<{>	1B	5B	7B	BA	B0	No Code
<]>|<}>	1D	5D	7D	C5	2C	No Code
<RETURN>	No Code	0D	0D	0D	0D	No Code
<a>|<A>	01	61	41	BF	C4	No Code
<s>|<S>	13	73	53	CB	A6	No Code
<d>|<D>	04	64	44	A1	AF	No Code
<f>|<F>	06	66	46	B4	E2	No Code
<g>|<G>	07	67	47	E0	AC	No Code
<h>|<H>	08	68	48	E9	E7	No Code
<j>|<J>	0A	6A	4A	E8	EB	No Code
<k>|<K>	0B	6B	4B	D2	C9	E5
<l>|<L>	0C	6C	4C	CA	C8	No Code
<;>|<:>	No Code	3B	3A	C7	AB	No Code
<'>|<">	No Code	27	22	A7	2E	No Code
<\>|<|>	No Code	5C	7C	2D	25	No Code
<<>|<>>	No Code	3C	3E	40	3A	No Code
<z>|<Z>	1A	7A	5A	BC	28	FB
<x>|<X>	18	78	58	BB	29	No Code
<c>|<C>	03	63	43	E1	A9	No Code
<v>|<V>	16	76	56	CD	CE	No Code
<b>|<B>	02	62	42	D4	DA	No Code
<n>|<N>	0E	6E	4E	D7	EC	No Code
<m>|<M>	0D	6D	4D	B7	3F	No Code
<,>	No Code	2C	2C	C1	B2	No Code
<.>	No Code	2E	2E	E3	CC	No Code
</>|<?>	No Code	2F	3F	BD	C6	No Code
<SPACE>	00	20	20	20	20	No Code

[EK-VT38T-L4]
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Digital Equipment Corporation

VT382 THAI DISPLAY TERMINAL USER GUIDE ADDENDUM

The new version of the VT382 Thai Display Terminal (VT382-TD) supports the new keyboard (LK401-CT) with better human ergonomics. This addendum describes the differences between the new keyboard and the old keyboard (LK201-QT).

[Unpacking]

The LK401 has retractable keyboard stands. Therefore separate keyboard standoffs are not supplied in the carton.

[Indicator Lights on the Keyboard]

The LK401 keyboard has two LEDs ("Hold Screen" and "Lock"). "Thai" and "Wait" LEDs are removed. "Hold Screen" and "Lock" LEDs are indicated by marks shown in Fig-1.

Hold Screen

Lock

Fig-1

[Status Line on the Screen]

The status indicators for "Hold Screen", "Lock", "Thai", and "Wait" are shown in the status line of the screen. The format is as follows:

<Hold><Lock><Thai><Wait>

If the status line display is disabled, the user has no indication of the "Thai" and "Wait" status.

[Keyboard Layout]

The LK401 keyboard layout is shown in Fig-2.

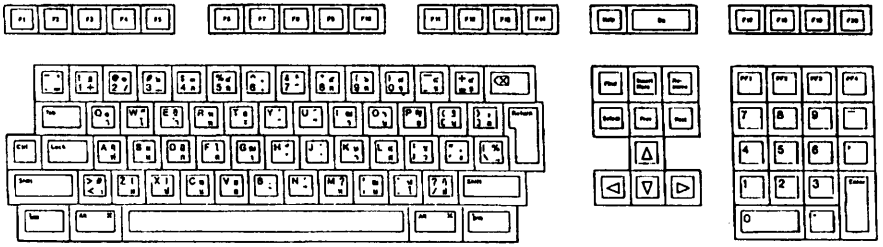

Fig-2

The two "Alt" keys around the space bar are always dead. The two "Thai" keys are identical to each other.

[Power-up Selftest]

Everytime you turn the terminal on, the terminal automatically runs a power-up selftest. If malfunctions are detected, the LK401 keyboard may indicate the error status by issuing a beep sound (combination of long beep and short beep). In this case, please report the sound pattern to our service center. You can stop the beep sound by pressing any key, and start it again by pressing the space bar.