

B

Telnet

1. IND Telnet Client

The IND Telnet Client (INDTN) provides IND wireless terminals with access to remote computer systems. With the assistance of terminal emulation software, the telnet client uses TCP/IP and the telnet protocol to exchange data with the host system. The host system is expected to provide a telnet server process.

Listed below are some of the terminals with spread spectrum wireless networking cards (IEEE 802.11 and 802.11b) supported by INDTN

- FTF2440,
- FTF2460/70/80,
- PDT3140/42/46,
- PDT3540 (up to version 4.10)
- PDT6140/42/46,
- PDT6840/42/46,
- PDT7540,
- VRC3940 (up to version 3.18),
- VRC6940/42/46,
- WWC1040/1060,
- Falcon335.

The program emulates a DEC VT220 terminal. It controls a virtual 24 X 80 character screen that interprets the incoming flow of characters like a DEC-VT220.

INDTN displays a section of this screen (referred to below as the "source screen") on the physical display of a wireless terminal (the "target screen"). This screen is normally much smaller:

1. IND Telnet Client

- 12 X 40 characters (FTF2440),
- 8 x 20 characters (PDT3140 and PDT6140),
- 16 x 21 characters (PDT6840).

Which section is displayed depends on the selected program options and the position of the cursor on the source screen.

- ☞ Additional information is located on "*Display*" on [page B-81](#).

2. Installation

The INDTN software is downloaded onto the terminal.



Note

Alternatively, you can install the software from a TFTP server over the wireless network (for instructions, see "*Enable Automatic Radio Update*" on [page C-12](#)).

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○ Requirements


Downloading requires

- the Archive File
(www.ind-autoid.com: Products | Wireless Data Systems | Software | IND Telnet | Download | INDTN),
- a DOS-compatible PC;
- a terminal;
- for the FTF2440,
a null modem cable;
- for the PDTxx40,
a cradle or recharging cable.

○ Archive File

The INDTN software and other required software utilities are contained in the archive file. This file is a self-extracting archive.

Terminal Type	Name of the Archive File
FTF2440 with 8 MB chipDisk	tn2440.exe
FTF2440 with 2.7 MB FlashDisk	tn2440fd.exe
PDT3140, PDT3142, PDT6140, PDT6142, PDT6840, PDT6842	tn3140.exe
PDT3146, PDT6146, PDT6846	tn3146.exe

 Additional archive files are available on the Web.

○ Special Considerations for PDTxx40

When installing the software to PDTs over a cradle or cable, please observe the following:

- The telnet and scanner configurations are set back to their default values. To maintain the old configurations, you must write them down **before installation** and then enter them again manually afterwards (see "Telnet" on page B-42 and "Scanner" on page B-48).
- The Sprectrum24 protocol is preset to 802.11. You may need to set it back to *Spring* (see "*Spring* → 802.11 or 802.11 → *Spring*" on page C-41).
- When installing software over a cradle or cable, there are two possible options: "*Update*" (the configuration settings of the terminal are kept) and "*Reinstall*" (the default settings of the new software are used).

► Installing the INDTN Software on the Terminal

1. Make a new directory on the hard disk (md c:\indtn, for instance) and change to this directory (cd c:\indtn).
2. Download the archive file from the Internet and save it in the c:\indtn directory.
3. Extract the archive file by entering the following command:

```
a:\archive file.exe
```

☞ The name of the corresponding archive file is listed in the table under "Archive File" on [page B-5](#).

4. Depending on the terminal type, start one of the following installation programs:

Terminal Type	Installation Program
FTF2440	ins2440
PDTxxxx	install

- The installation program will display the additional installation steps on the screen and run the necessary routines.



3. System Start

Depending on the terminal type, different events trigger a system start.

3.1 System Start – FTF2440

The terminal starts the system after one of the following events has occurred:

- a power source is connected
- the "reboot" key combination is pressed: [Shift] + [Ctrl] + [▼]
- "Restart Terminal" is selected in the Service Functions menu (cf. "Restart Terminal" on [page C-38](#)),
- the boot command is entered.

3.1.1 Boot Process – FTF2440

The system start sequence is as follows:

- The following message is displayed:

```
FTF2440  IND Mobile Datensysteme GmbH
```

Next, the BIOS performs tests and initializes the hardware.

- The operating system (DR-DOS) is started.
- C:\CONFIG.SYS controls the following processes:

- The startup message of the base firmware is displayed:

```
FTF2440 BaseFirmware V3.15  
Copyright 2002 IND Mobile Datensysteme
```

- After a five-second pause, the boot sequence is resumed and the system starts automatically in terminal mode (cf. "Start Menu" on [page C-3](#)).



Note

While the start menu is being displayed, you can open the Start Menu by pressing [8]. There, you will be able to perform certain maintenance functions (see "Start Menu" on [page C-3](#)).

- The system sets up a 900 kB RAM disk as drive D: and starts a number device drivers (such as the terminal keyboard and the PC keyboard). This is left out in the minimal configuration.
- C:\AUTOEXEC.BAT controls the following processes:
- The file system of the FlashDisk is verified.
 - If errors are detected when the file system is verified, the system will make three attempts to correct them.
 - If the system is unable to repair the errors automatically, an error message is displayed.
In this case, you can confirm the message by pressing [1] — you'll have to reinstall the firmware (or individual files).

To ignore the message, press [2] (for instance in order to be able to complete an urgent task). You should, however, reinstall the firmware as soon as possible or send the terminal in to IND for repairs.

You can repeat the file system verification by pressing [3].

- As soon as the boot process has been completed, the Start Screen is displayed (see Start Screen).

**Note**

If the terminal has not yet been configured, you will automatically be taken to the Configuration menu (see "*Terminal Configuration*" on [page B-39](#)).

3.2 System Start – PDTxx40

There are three different types of system starts:

- starting in command mode (for downloading firmware)
- cold boot
- warm boot

➤ Starting in Command Mode

1. Turn the terminal off.
2. Press the following keys simultaneously **and hold them down**:

Terminal ¹	Key Combination
PDT3140/21	[SEND] + [9]
PDT6140/22	[SEND] + [9]
PDTxx40/35	[BKSP] + [SHIFT]
PDTxx40/46	[F] + [I]"

1. Terminal Type/Number of Keys
3. Press down the [PWR] (power) key and then release it.
4. You can now release the other keys.
→ The terminal will reboot and start in command mode.

➤ Performing a Cold Boot

A cold boot erases the ramdisk and restores the saved configuration. If you have not yet saved a configuration, the default configuration will be restored.

1. Turn the terminal off.
2. Press the following keys simultaneously **and hold them down**:

Terminal ¹	Key Combination
PDT3140/21	[4] + [▲] + [ENTER]
PDT6140/22	[4] + [▲] + [ENTER]
PDTxx40/35	[FUNC] + [SPACE] + [▲]
PDTxx40/46	[A] + [B] + [D]

1. Terminal Type/Number of Keys
3. Press down the [PWR] (power) key and then release it.
4. You can now release the other keys.
→ The terminal will reboot.

➤ Performing a Warm Boot

A warm boot maintains the ramdisk and the saved configuration is restored.

1. Turn the terminal off.
2. Press the following keys simultaneously **and keep them pressed**:

Terminal¹	Key Combination
PDT3140/21	[.] + [▼]
PDT6140/22	[.] + [▼]
PDTxx40/35	[F] + [J] or [/] + [+]
PDTxx40/46	[4] + [5]

1. Terminal Model/Number of Keys
3. Press down the [PWR] (power) key and then release it.
4. You can now release the other keys.
→ The terminal will reboot.

3.2.1 Boot Process – PDTxx40

The sequence of the boot process is as follows:

- The BIOS performs various tests and initializes the hardware.
- The operating system (DR-DOS) is started.
- B:\AUTOEXEC.BAT controls the following processes:
 - After "Service-NVM" has been installed, the system checks if it can proceed with the verification of the E:\AUTOEXEC.BAT and E:\FLSHAUTO.BAT files. The following message will appear on the screen for approximately 3 seconds

Checking..



Note

While this message is being displayed, you can switch to "Service-NVM" by pressing [8] or [CTRL]+]FUNC]+[1].

- If "Service-NVM" has not been installed, the above message is skipped and the system proceeds directly to E:\FLSHAUTO.BAT.
- E:\FLSHAUTO.BAT controls the following processes:
 - The start message for the base firmware will appear approximately 15 minutes after system start.

PDT3x40/6x40
BaseFirmware V3.2
Copyright 2002 IND

- After a 5-second pause, the boot sequence is resumed and the system starts automatically in terminal mode (cf. "Start Menu" on [page C-3](#)).

**Note**

While the start menu is being displayed, you can open the Start Menu by pressing [8] or using the key combination [CTRL], [FUNC], [1]. There, you will be able to perform certain maintenance functions (for more information, see "Start Menu" on [page C-3](#)).

- As soon as the boot process has been completed, the Start Screen is displayed (see "Start Screen" on [page B-17](#)).

**Note**

If the terminal has not yet been configured, you will automatically be taken to the Configuration menu (see "Terminal Configuration" on [page B-39](#)).

3.3 Start Screen

After booting is completed, the start screen will appear.

```
TELNET V5.9 (C) IND

Terminal-IPAddr
192.168.002.015
Host HOST-1

Press ENTER to login
CLEAR to select host
```

Fig. B-1: Start screen



Note

To use all the functionality of the IND Telnet software, a *license code* specifically generated for the respective terminal is required (see "Software License" on [page B-19](#)).

The terminal then registers itself on the network with the displayed terminal IP address.



Note

Instead of the IP address, the terminal number (host portion of the IP address) or nothing at all may be displayed here. You can set the display format in the *TELNET* configuration menu (for more information, see "Telnet" on [page B-42](#)).

The activated host profile is shown in the HOST field (cf. "Host Profiles" on [page B-91](#)). If only one host profile is present, the profile is not displayed.

You can now

- Start a telnet session by pressing [ENTER]. The Telnet client will then attempt to contact the host entered in the configuration menu.
- Select a different host profile by pressing [CLR] (cf. "*Selecting a Profile*" on [page B-93](#)).
- Open the Configuration menu of the Telnet client by pressing [F3] (see "*Terminal Configuration*" on [page B-39](#)).

4. Software License

To use the complete functionality of IND Telnet, a *license code* is needed that is specifically matched to the particular terminal.

Without this license code, IND Telnet will function with the following restrictions:

- Each telnet session will automatically be ended ten minutes after the connection is established.
- After the telnet session has been ended and when exiting the configuration program, you are prompted to enter the license code.

You can obtain license codes from IND by submitting the terminal MAC address(es) (cf. "*Determining the MAC Address*" on [page B-21](#)).

You will receive your license codes either as

- a printout of a table of MAC addresses and their corresponding license codes for manual entry or
- in the form of a license file that can be transferred to the terminal through a cabled or wireless connection.

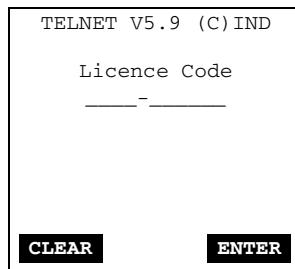
4.1 License File

For multiple terminals, a common license file can be used. The license file is saved as follows:

- for manually entered license codes, it is saved as `C:\NET\LANWP\LICENCE`
- for common license files, it is saved as `C:\NET\LANWP\LICENCE.ALL`

4.2 Entering the License Code

After the initial installation and so long as you have not saved a license code, you will automatically be taken to the following screen.



The screenshot shows a terminal window with the title "TELNET V5.9 (C) IND". The main text is "Licence Code" followed by a horizontal line with a small vertical bar in the center, indicating an input field. At the bottom of the window, there are two buttons: "CLEAR" on the left and "ENTER" on the right.

Fig. B-2: Entering the license code

You can record the license code manually or with the help of the scanner if desired. Confirm the entry by pressing [ENTER]. The code is saved on the terminal in the `LICENSE` file.

**Note**

You can cancel the license entry by pressing the [CLEAR] key if for instance a license code is not available or to first determine the MAC address of the terminal.

► Determining the MAC Address

1. Open the terminal configuration menu.
2. Select the *4 Network* submenu there and select *2 Radio Parameter*.
 - The MAC address of the terminal is displayed in the MAC address field (cf. "*Radio Parameters*" on [page B-73](#)).



5. Keyboard

The keyboards of the following device types are described in this chapter:

- "FTF2440" on [page B-23](#),
- "PDT3140" on [page B-26](#),
- "PDT6140" on [page B-28](#),
- "PDT6840" on [page B-30](#).

5.1 FTF2440

The FTF2440 is equipped with a membrane keyboard with:

- numerical keypad,
- cursor keys,
- 3 softkeys (red, white, green)
- 4 function keys (F1 through F4),
- 2 keys (SHIFT and CTRL) for switching between different shift states.

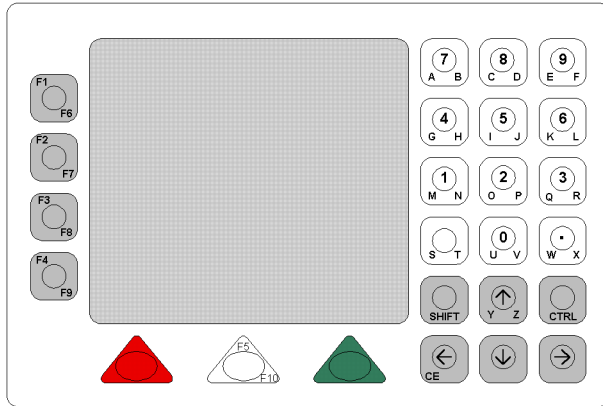


Fig. B-3: The FTF2440's keyboard

5.1.1 Shift States

Most of the keys on the membrane keyboard can be used in three shift states (cf Fig. B-4). The digits 0 through 9 are included in the first shift state and can be typed directly.

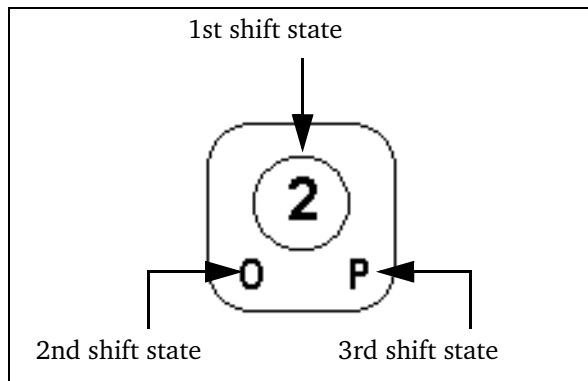


Fig. B-4: Shift states of the membrane keyboard

The letters of the alphabet A through Z are located in the second and third shift states and can be accessed with the help of the [SHIFT] and [CTRL] keys:

[SHIFT] = 2nd shift state
(characters depicted on the lower left of the keys)

[CTRL] = 3rd shift state
(characters shown on the lower right of the keys)

Example

In order to produce a letter **O**, first press the shift key **[SHIFT]** followed by the **[2]** key.

For a letter **P**, first press the **[CTRL]** key and then press **[2]**.

Important

Pressing one of the shift keys to switch between shift states will always affect only the next key that is pressed. No shift-lock feature is available. That means you have to press the respective shift key each time before you can enter a character located in the second or third shift states.

The shift key and the data key must be pressed **in succession**.

5.2 PDT3140

The PDT3140 described here is equipped with

- 35 keys (made of conductive rubber),
- a side-mounted alpha shift key and
- a scan button.

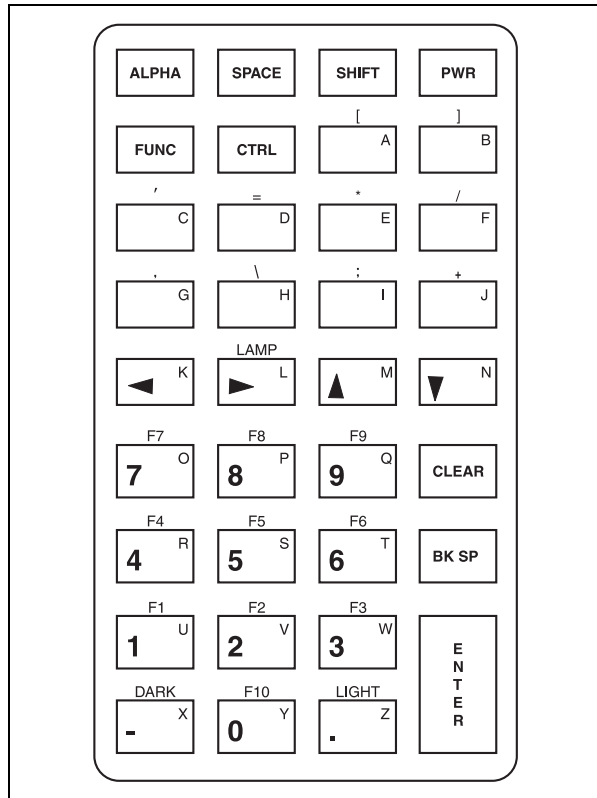


Fig. B-5: Keyboard of the PDT3140 with 35 keys

5.2.1 Shift Keys

The keyboard of the PDT3140 has 35 keys and several shift keys:



Switches the alpha-mode on and off.

In alpha-mode, the letters printed on the keyboard are used except where characters and special characters are printed on keys.



Activates the key values printed in green:

- F1 ... F10,
- light,
- contrast,
- etc.



Together with the keys A - Z, provides standard control values such as

[CTRL], [I] = $\wedge I = 09_{16}$



The keys assigned to the shift state are not labeled.

 A complete keyboard layout diagram is available in the PDT3140's *Product Reference Guide*.

5.3 PDT6140

The PDT6140 described here is equipped with:

- 35 keys and
- a scan button.

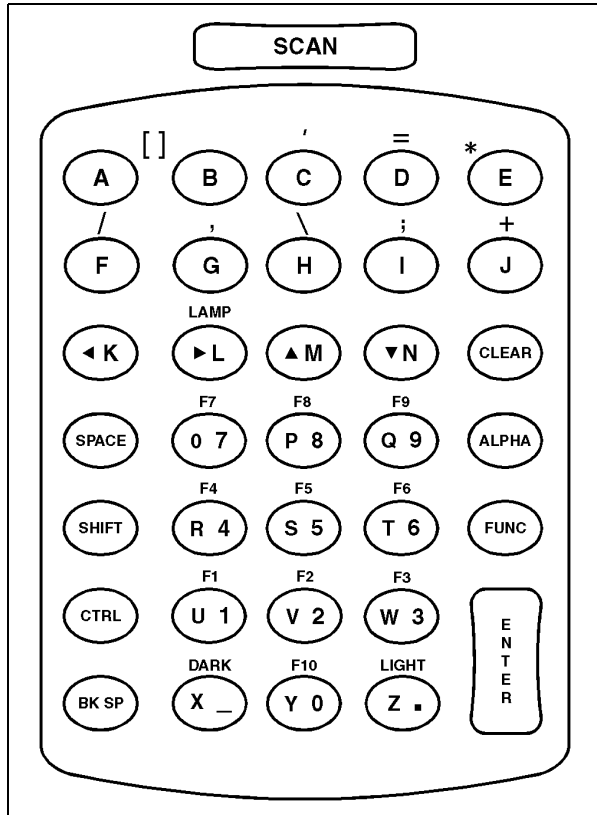


Fig. B-6: Keyboard of the PDT6140 with 35 keys

5.3.1 Shift Keys

The keyboard of the PDT6140 has 35 keys and several shift keys:



Switches the alpha-mode on and off.

In alpha-mode, the letters printed on the keyboard are used except where characters and special characters are printed on keys.



Activates the key values printed in green:

- F1 ... F10,
- light,
- contrast,
- etc.




Together with the keys A - Z, provides standard control values such as

[CTRL], [I] = $\wedge I = 09_{16}$



The keys assigned to the shift state are not labeled.

 A complete keyboard layout diagram is available in the PDT6140's *Product Reference Guide*.

5.4 PDT6840

The PDT6840 described here is equipped with:

- 35 keys and
- a scan button.

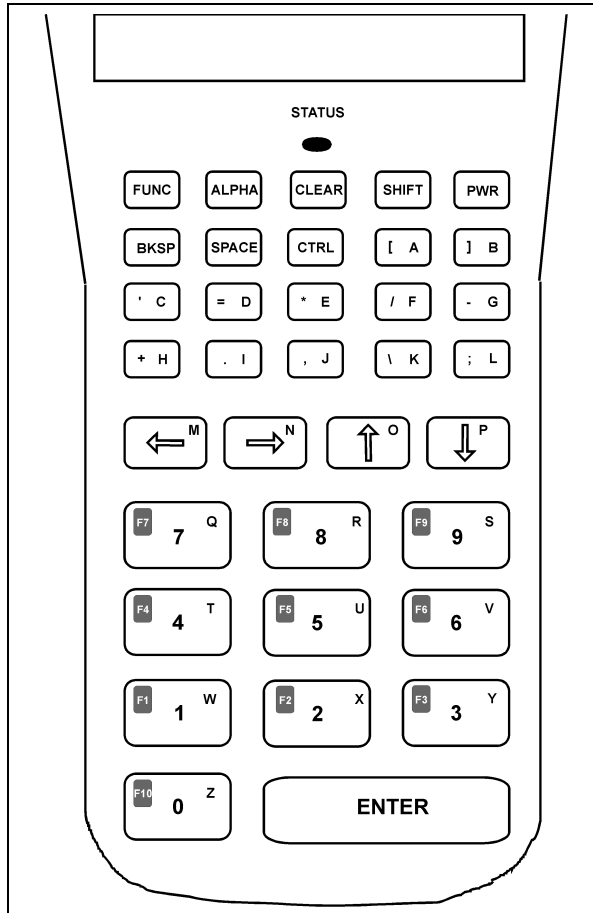


Fig. B-7: Keyboard of the PDT6840 with 35 keys

5.4.1 Shift Keys

The keyboard of the PDT6840 has 35 keys and several shift keys:

- ☞ For information on the PDT6840 with 46 keys, please refer to the reference card entitled "Overview — TELNET for PDT6840 (46-key)."

ALPHA

Switches the alpha-mode on and off.

In alpha-mode, the letters printed on the keyboard are used except where characters and special characters are printed on keys.

FUNC

Activates the key set values printed in blue

- F1 ... F10
- light,
- contrast,
- etc.

CTRL

Together with the keys A - Z, provides standard control values such as

[CTRL], [I] = $\wedge I = 09_{16}$

SHIFT

The keys assigned to the shift state are not labeled.

- ☞ A complete keyboard layout diagram is available in the PDT6840's *Product Reference Guide*.

5.5 Keys and Key Combinations

Similar to PC-keyboards, there are many keys and key combinations which are assigned special functions. Some of these functions are the display settings, cursor navigation, etc. Nearly all the keys are under the control of the current application. As a result, it is not possible to describe the function of all the keys in this handbook — there are, however, certain common practices that most applications adhere to.














Note

If a + is shown between two keys, this means that the keys must be pressed **simultaneously**.










5.5.1 Terminal Operation

The following keys are interpreted directly by the terminal, not by the application.


Keys			Action
FTF2440	PDT		
	3140/6140	6840	
 , 	[FUNC], [X]	[FUNC], [I]	increase contrast
 , 	[FUNC], [Z]	[FUNC]	decrease contrast
—	[FUNC], [L]	[FUNC], [L]	light on/off
 +  + 	—	—	Reboot

Keys			Action
FTF2440	PDT		
	3140/6140	6840	
	[F] + [J]	[PWR] + [F] + [H]	reboot (warm start)
 , 	[CTRL], [L]	[CTRL], [L]	end telnet connection
 , 	[CTRL], [N]	[CTRL], [N]	upper/lower case letters





5.5.2 Navigation

Keys			Action
FTF2440	PDT		
	3140/6140	6840	
 , 	[BKSP]	[BKSP]	backspace (delete last character)
 , 	[CTRL], [K]	[CTRL], [K]	home (AS/400 only)
 , 	[CTRL], [I]	[FUNC], [SPACE]	move cursor to next entry field
 , 	[SHIFT], [CTRL], [I]	[SHIFT], [FUNC], [SPACE]	move cursor to previous entry field
	[CLEAR]	[CLEAR]	back, no, cancel

5. Keyboard

Keys			Action
FTF2440	PDT		
	3140/6140	6840	
	[ENTER]	[ENTER]	continue, yes, OK

5.5.3 Special Characters

Keys			Action
FTF2440	PDT		
	3140/6140	6840	
 , 	—	—	minus sign
 , 	[SHIFT], [I]	[SHIFT], [;]	colon










5.6 Key Combinations (VT Emulation)

In VT emulation, the action of each key or key combination is determined by how the host application processes it. The following table is for the programmer of a host application that is intended to function correctly with the respective device type. It shows which key values are passed on to the application.

















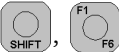
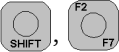
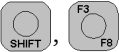
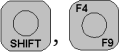

Note

In the event that the terminal can't distinguish between upper and lower case letters, you can switch between upper and lower case using a special key combination (see "*upper/lower case letters*" on [page B-33](#)).



Keys		Function	Hexadecimal (7 Bit)
FTF2440	PDTxx40		
 , 	[BKSP]	backspace del	08 or 07
 , 	[FUNC], [SPACE]	tab	09
	[ENTER]	return	0D
	[CLEAR]	escape	1B
 , 	[SHIFT], [FUNC], [SPACE]	backtab	
	[▲]	up	1B 5B 41

5. Keyboard

Keys		Function	Hexadecimal (7 Bit)
FTF2440	PDTxx40		
	[▼]	down	1B 5B 42
	[▶]	right	1B 5B 43 ²⁾
	[◀]	left	1B 5B 44 ²⁾
	[FUNC], [1]	F1	1B 4F 50
	[FUNC], [2]	F2	1B 4F 51
	[FUNC], [3]	F3	1B 4F 52
	[FUNC], [4]	F4	1B 4F 53
	[FUNC], [5]	F5	1B 5B 31 35 7E ¹⁾ or 1B 5B 31 36 7E
	[FUNC], [6]	F6	1B 5B 31 37 7E
	[FUNC], [7]	F7	1B 5B 31 38 7E
	[FUNC], [8]	F8	1B 5B 31 39 7E
	[FUNC], [9]	F9	1B 5B 32 30 7E
	[FUNC], [0]	F10	1B 5B 32 31 7E

Keys		Function	Hexadecimal (7 Bit)
FTF2440	PDTxx40		
	[CLEAR]	F11	1B 5B 32 33 7E ²⁾
—	—	F12	1B 5B 32 34 7E
	[SHIFT], [FUNC], [1]	F13	1B 5B 32 35 7E
	[SHIFT], [FUNC], [2]	F14	1B 5B 32 36 7E
	[SHIFT], [FUNC], [3]	F15	1B 5B 32 38 7E
	[SHIFT], [FUNC], [4]	F16	1B 5B 32 39 7E
	[SHIFT], [FUNC], [5]	F17	1B 5B 33 31 7E
—	[SHIFT], [FUNC], [6]	F18	1B 5B 33 32 7E
—	[SHIFT], [FUNC], [7]	F19	1B 5B 33 33 7E
—	[SHIFT], [FUNC], [8]	F20	1B 5B 33 34 7E
—	[FUNC], [◀]	find	1B 5B 31 7E
—	[FUNC], [A]	insert	1B 5B 32 7E
—	[FUNC], [BKSP]	delete	1B 5B 33 7E
—	[FUNC], [▶]	select	1B 5B 34 7E

5. Keyboard

Keys		Function	Hexadecimal (7 Bit)
FTF2440	PDTxx40		
—	[FUNC], [▲]	page up	1B 5B 35 7E
—	[FUNC], [▼]	page down	1B 5B 36 7E
—	[CTRL], [R]	reset	12
 , 	[CTRL], [K]	reset	12 0D
—	[CTRL], [A]	attention	01
—	[CTRL], [C]	SysReq	03
—	[CTRL], [E]	erase input	05
—	[CTRL], [X]	field exit	18 ¹⁾

1. only for host type **AS400** or **AS400a** (see "Host" on [page B-43](#)).
2. for host type **AS400**, the meaning changes (see "For the AS400a operating system, the following also applies:" on [page B-44](#))



Note

Additional information is available at www.ind-autoid.com under Products | Wireless Data Systems | Software | IND Telnet.