User's Guide

Voyager 2000

Version 1.1

SAFETY INSTRUCTIONS

✓ **Do not use any other battery or power adapter than those provided by the producer of the printer. By using other equipment, you could expose yourself to the risk of fire or dangerous accidents.**

✓ **Do not bend the power cable or put heavy objects on it, as you could damage the cable and place yourself at risk of fire or electric shock. You should stop working and replace the defective cable immediately.**

✓ **Do not throw batteries into the fire nor expose them to heat, as this could make them explode and lead to damage and/or bodily harm.**

✓ **Do not place batteries into water nor use them in a damp environment, as this could result in fire or electric shock. This could also lead to a battery leak or explosion, and consequently a fire or bodily harm.**

✓ **Do not dismantle batteries because this could short out parts and result in fire and other serious accidents.**

✓ **Do not leave batteries in direct contact with strong sunlight or high temperatures because this may cause fire and bodily injuries.**

✓ **Do not dismantle the battery charger. Follow safety instructions to avoid overheating or damaging the adapter or battery charger, as well as electric shock, fire or other accidents.**

✓ **Use the battery charger recommended by Polhit Sp. Z.o.o. Use of other charging devices may lead to batteries being overheated or damaged, and result in fire or accidents.**

✓ **Never use your printer in extremely damp areas or places where the printer could be exposed to any liquid. If liquid penetrates the printer, it can lead to fire, electric shock or other serious accidents.**

✓ **Never touch the print head immediately after the printer has been used because it may be very hot then.**

✓ **To disconnect a cable, pull the cable connector (plug), not the cable itself. Otherwise you can damage the cable.**

✓ **You have to turn the printer off, disconnect the power cable and take the battery off in case you notice:**
- **The printer not returning to its default state after error**

- Smoke or an unusual noise or smell from your printer
- A piece of metal or any liquid on the printer's cover or in its slot.

✓ Operating the printer in any other way than the one described by the producer may lead to accidents or fire.

✓ Dismantling or any changes to the printer are not allowed. Do not attempt to repair the printer yourself. This may lead to fire, electric shock or other hazards.

Contents

1.   Introduction

Voyager is a family of thermal printers using a line print head and printing on 112 mm thermal paper.
Voyager printers are light and small, and can work on an internal battery.
They are resistant to the elements, damage and shock. They feature very efficient Fujitsu thermal printing heads.
They were built to be used on the road and in the harshest conditions.
Voyager printers can be used on the spot to print receipts or order confirmations.
They can be mounted on vehicles, forklifts or other objects. The printers are meant to work with:

- Mobile computers

- Point of sales

- Access control systems

- Sale support sets

- Order taking sets

- **Data** Collection sets

- **Meter Reading sets**

- Other set-ups

2.   Features of Voyager 2000 printer

- Dimensions: 190 x 170 x 70 mm

- Weight: 0.8 kg

- **Option for hardware and software communication interface switch-over** (the printer can be equipped with radio and IrDA modules)

- Power source: NiMH 7.2V 3.8Ah battery or external 8.5V power adapter

- **Option** for charging the battery with an external charger

- Memory: 128 KB or 512 KB RAM

- Resolution: 203 dpi

- Adjustable print quality

- Variable printing speed

- Programmable self shut-off mode

- Printer wake-up by computer mode

- Variable data transmission speed

- Alternative keyboard or parallel interface input mode

- Automatic paper feed

- Two work modes under lower voltage: stable printing speed or maintained print quality.

- Resident ASCII International and Polish character sets

- 90 and 270 degree vertical print mode

- Bar code printing, including PDF417

- Operating temperature: -10°C to 50°C

3.   Using the Printer

3.1. Components

Printout Slot

Lever Opening
the Printing

Paper Guide and
Printing Mechanism Inlet

Battery Power
Connector

Battery

Battery Removal Lever

Figure 1. Main Parts

Paper Cover Lever

Figure 2. Top View

RS232 Interface

External Power Supply or Battery Charger Socket
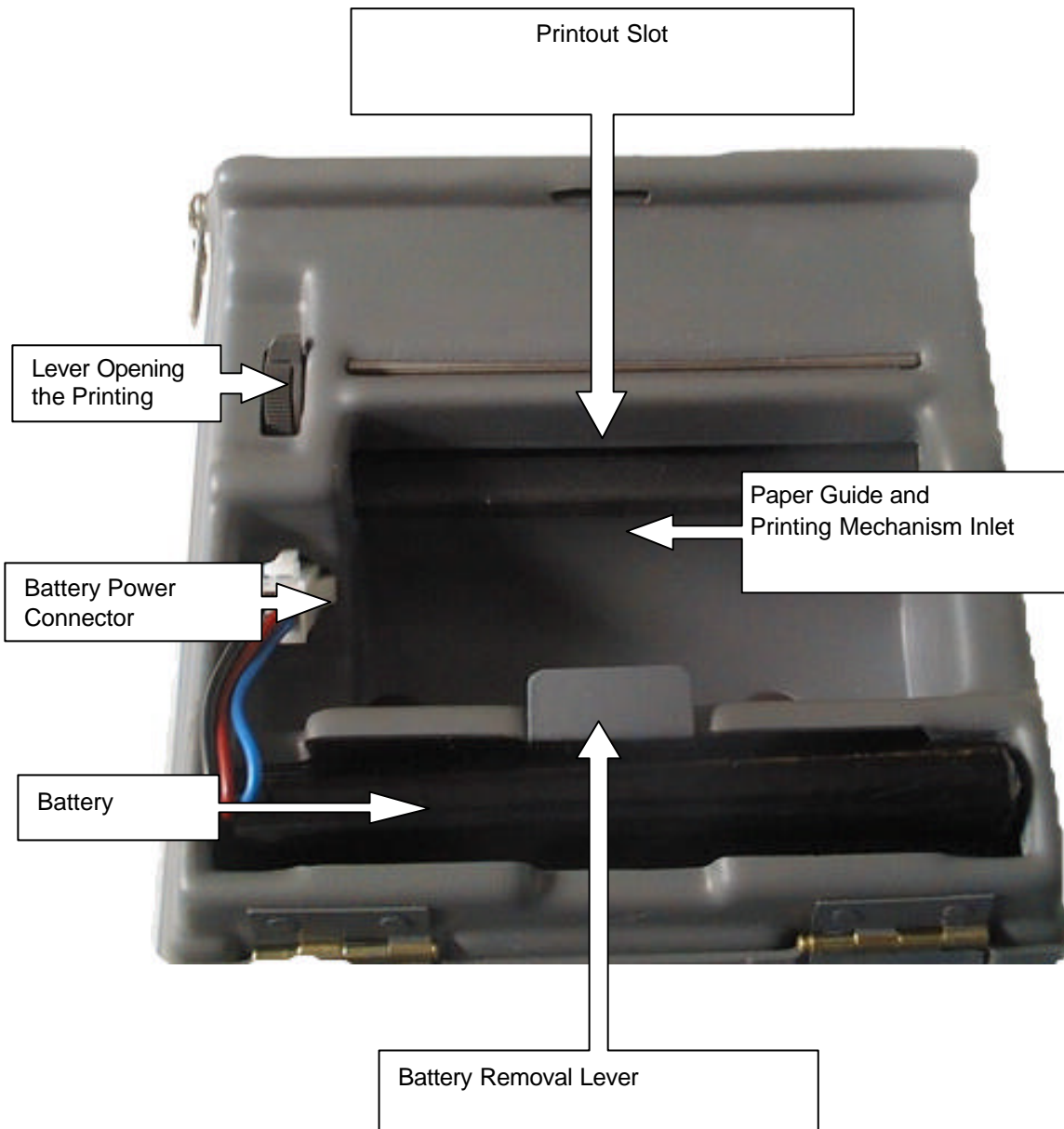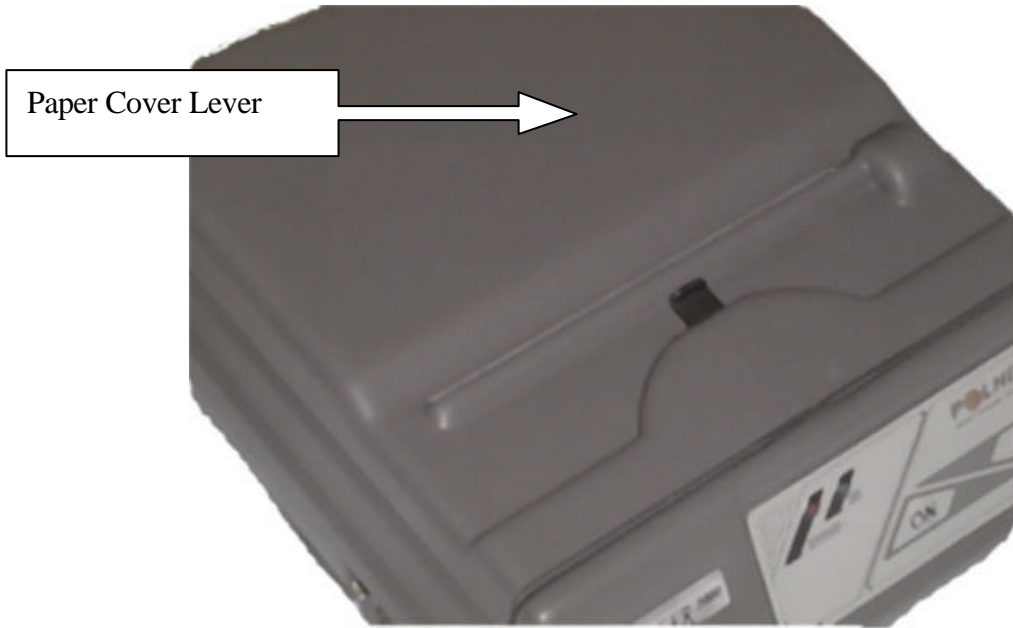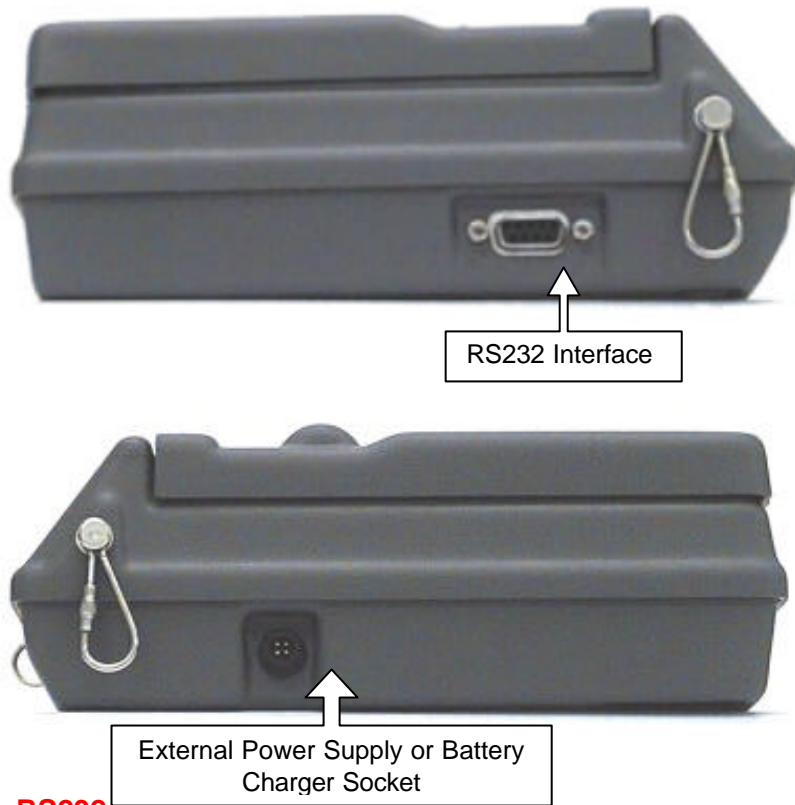
Figure 3. RS232 and Power sockets location

3.2. Turning on and off

To turn on the printer press the [ON] button once or send a wake-up sequence to its serial interface.
When you see that the green LED on the keyboard marked [ON] has turned on, the printer is ready for work.
The printer can be shut off after:

- You press the [ON] button again
- You send a printer shut-off sequence
- Self shut-off time has passed (if the option has been activated)

3.3. Power Supply

3.3.1. Installing the Battery

In order to install the battery into the printer you should:

- Push the paper cover lock backwards and open the cover to see the battery compartment
- Place the battery cable downwards
- Insert the battery into the compartment, starting cable first into the right corner (where you see the cable connector socket). Then press the cable against the side with the battery.
  Notice! The battery cable should be placed tightly between the battery and
  the side or you will not be able to close the paper cover.

- Plug the power connector into the corresponding socket, located to the right of the paper compartment, and after the paper is inserted close the paper cover.
  Notice! After you install the battery you printer may be turned on. In this case you should turn it off.

Removing the battery:

- Open the paper cover the same way as when you loaded paper

- Unlock the battery cable connector and pull the cable out of the socket

- Inside the paper compartment locate the metal battery removal lever and pull it up. This will allow you to move the battery about 2 cm off the bottom of the compartment (at the end you should feel some resistance).

- Still holding the lever with one hand, grab the battery with the other and remove it from the compartment entirely

- Place the battery removal lever in its original position

- Install a charged battery and/or shut the paper cover

3.4. Paper Handling

You can load the paper in two ways:
- Semi-automatic (recommended)
- Automatic (not recommended)

    Semi-automatic method:
- Place the printer in front of yourself, facing the keyboard
- Open the paper cover to see the   paper compartment and have easy access to it
- Move the lever opening the printing mechanism towards the front of the printer to open the printing mechanism.
- Cut the paper as seen in figure 4. Put the paper roll into the paper compartment so as to have the cut end of the paper at the bottom of the compartment

Cut along the line

Rys. 4

- Turn the printer on
- Slide the paper edge into the slot over the paper guide and at the same time press the [@] button to engage the paper guide
- When the paper starts moving you can release the [@] button. However, if you notice the paper is being crumpled, continue helping the paper roll to stabilize its movement.
- Move the lever opening the mechanism backwards to shut the head
- Put the paper into the slot in the cover and shut the paper cover
- Tear off the excess paper with a decisive move forwards
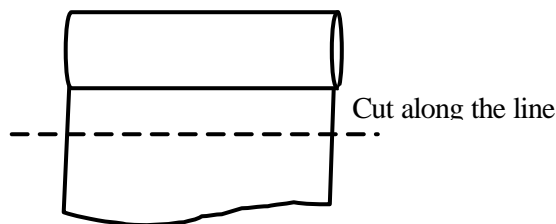
Automatic method:
- Place the printer in front of yourself, facing the keyboard
- Open the paper cover to see the paper compartment and have easy access to it
- Cut the paper as seen in figure 4. Put the paper roll into the paper compartment so as to have the cut end of the paper at the bottom of the compartment
- Turn on the printer
- Slide the paper edge into the slot inside the paper compartment over the paper guide   and at the same time press the [@] button to engage the paper guide - the printer detects paper and loads it automatically.
- Press [@] button and pull paper till the roll starts moving. Now you can release the [@] button. However, if you notice the paper is being crumpled, continue helping the paper roll to stabilize its movement.
- Put the paper into the slot in the cover and shut the paper cover
- Tear off the excess paper with a decisive move forwards

3.5. Control Panel

There are two lights and two buttons on the control panel of Voyager 2000 as seen in Figure 2.
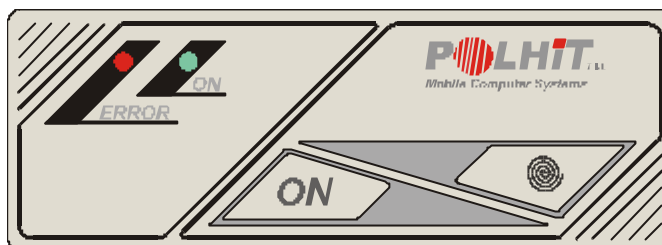
Figure 2. Control Panel

3.5.1. Light's indicators

Green Light – ON
  ? Continuously on: prime state, voltage normal
  • Blinking 1/8 (short period on, long break): too low voltage
  • Blinking 7/8 (long period on, short period off): too high voltage

Red Light – ERROR:
  • Continuously on: too high temperature of the thermal head
  • Blinking 6/8 (long periods on): too low temperature of the thermal head
  • One burst about every 2 seconds: no paper
  • Two bursts about every 2 seconds: open head
  • Three bursts about every 2 seconds: no paper and open head
  • Fast blinking: communication error or unknown error

3.5.2. Buttons

The [ON] Button:
Press once to turn the printer on or off
When you press the [@] button continuously and at the same time press the [ON] button several times, the printer will switch between various modes.
The [@] Button:

Pushes paper out.
When you press the [@] button continuously and at the same time press the [ON] button a number of times, the printer will switch between modes as shown in Table 1.

Table 1. Voyager 2000 Work Modes

Work mode	Number of times [ON] button pressed
Self test mode	1
Demo mode	2
Keyboard programming mode	3
RS232 programming mode	4
Default mode	5
Troubleshooting mode	6

3.6. Work Modes of the Printer

The Voyager 2000 printer can work in one of ten modes performing certain tasks or on user's demand.
At one time the printer can be in one of the below modes

- Stand-by mode

- Work-ready mode

- Working mode

- Self test mode

- Troubleshooting mode

- Default mode

- Keyboard programming mode

- RS 232 programming mode

- Demo mode

- Error message mode

The printer switches into stand-by mode, work-ready mode, working mode or error

message mode according to the task being performed.

The switch-over occurs automatically, without any input from the user.
The other modes are initiated by the user.
The switch-over to a required mode is also possible at printer start-up if the [@] button is pressed on.

3.6.1. Self test Mode

If during printer start-up the [@] button is pressed, the self-test mode will commence.
The printer will switch to the self-test mode if the [@] button is pressed for over 4 seconds.
The self-test mode starts with the printer name, hardware configuration, version number and current printer settings being printed out.
Then, the printer tests RAM and serial interface circuits.
Test results are printed as applicable messages.

In order to test the RS323 interface you have to close CTS-DTR AND RX-TX circuits with the actual testing interface.

After all the tests have been executed, the printer switches automatically into work-ready mode.

3.6.2. Demo Mode

To switch into the demo mode at start-up time, you have to keep pressing [@] and press [ON] once simultaneously. Then release the [@] button.

The printer will switch to the demo mode if [@] is be pressed for over 4 seconds.

In the demo mode the printer performs the print head test and then produces a demonstration printout.

3.6.3. Keyboard Programming Mode

To switch into the keyboard programming mode at start-up time, you have to keep pressing [@] and at the same time press the [ON] button twice. Then release the [@] button.

The printer will switch to the keyboard programming mode if the [@] button is pressed for over 4 seconds.

In the keyboard programming mode the printer gives the message

```
Keyboard programming mode
      [ON] - to keep

  [@] - to change
```

Then the first parameter value will be printed.

The user can press [@] once and change the value or press [ON] once to keep the current setting.

The printer saves the setting, prints the next parameter and waits for the user's decision.

After all the parameters have been set, the printer asks for confirmation and leaves the programming mode.

If you answer affirmatively (the [ON] button), all the changes will be saved and the current settings will be printed out.

If you cancel the changes ([@] button), the printer will go back to the first question concerning the change of the first parameter value.

If during the process of changes no button has been pressed within 5 seconds, the printer will ask to confirm the previous changes.

After all the functions have been executed, the printer switches automatically into work-ready mode.

3.6.4. RS232 Programming Mode

To switch into the RS-232 programming mode at start-up time, you have to keep the [@] button pressed in and at the same time press the [ON] button three times. Then release the [@] button.

The printer will switch to the RS-232 programming mode if the [@] button is pressed for over 4 seconds.

In RS-232 mode the printer prints the applicable message and switches to the receive data state.

The printer waits for 10 seconds to get the new data.

If no data is received within the period, it will print the message:

No data or error
Settings not changed

After that the printer switches to the work-ready mode.

If within the 10-second period not all or erroneous data are received, the printer will

print the message:

Error occurred

Settings not changed.

If within the 10-second period the printer has received accurate data, it will save the new values instantly and print out the current settings.
After all the functions have been performed, the printer switches automatically into work-ready mode.
To program the printer you have to send the corresponding string:

"PROGRAMME-MODE"+ CR + n1 + … + n9

The correct values of *n1* to *n9* can be found in the table below. The numbers represent bits.

Table 2. Configuration Parameter Settings

No	Parameter	Value												
		0	1	2	3	4	5	6	7	8	9	10	11	12
1	Transmission speed	9600	19200	38400	57600	115200								
2	Additional interface mode	none	Radio	IrDA										
3	Graphics mode	Panasonic	Epson											
4	Number of chara- cters in a line	52	80	40										
5	Character table	USA	FRANCE	GERMANY	UK	DENMARK1	SWEDEN	ITALY	SPAIN	JAPAN	NORWAY	DENMARK2	LATIN2	MAZOVIA
6	Printing speed	Standard	Fast											
7	Print quality	Economy	Standard	Best										
8	Self shut-off	Off	1 min	2 min	3 min	4 min	5 min	6 min	7 min	8 min	9 min	10 min	11 min	12 min
9	Low power	Stable quality	Stable speed											

IMPORTANT! Value of $n8$ at self shut-off can be set up to maximum of 30 (meaning 30 minutes). In case a value of $n1$ to $n9$ exceeds its maximum permissible value, it is turned down to 0.

3.6.5. Default Mode

To switch into the default mode at start-up time, you have to keep the [@] button pressed in and at the same time press the [ON] button four times. Then release the [@] button.
The printer will switch to the default mode if [@] is pressed for over 4 seconds.
In default mode the printer first prints the applicable message.
Then the default settings are loaded and the current default settings are printed.
After the procedure has been completed, the printer switches automatically to the work-ready mode.

3.6.6. Troubleshooting Mode

To switch into the troubleshooting mode at start-up time, you have to keep the [@] button pressed in and at the same time press [ON] five times. Then release the [@] button.
The printer will switch to the default mode if [@] is pressed for over 4 seconds.
In troubleshooting mode the printer first prints the applicable message.
Then the printer is ready to print incoming characters along with control codes.
Character 0 and ASCII 0 are printed as 0.
In the troubleshooting mode the printer prints 52 characters in a line.
If printer receives less than 52 characters within 1 second, it prints them automatically.
The only way to leave the troubleshooting mode is to shut the printer off.

4. Battery Charging

Voyager 2000 is equipped with a battery charger to be plugged into an external 4-pin interface.

There is a lamp on the charger indicating stages of the charging process (see Table 3.)

Table 3. Charger Light Operation

Light	Charger Condition
Red	Battery too hot or not connected
Green – blinking	Charging on
Green – continuous	Charging completed, low current supercharging or battery not connected

5. Control Codes

Command	Function	HEX
NULL	Not operate	00
LF	Line feed	0A
FF	Form feed	0C
CR	Carriage Return	0D
DW	Double width	0E
SWH	Standard Width/ Height	14
CAN	Cancel	18
ESC	Esc	1B
OFF	Printer Off	1C
ESC RSB	Request Status Byte	1B 05
ESC -	Additional function	1B 10 cmd data
ESC A n	Line Feed Pitch Setting	1B 41 n
ESC B data	Set Bar Code Format	1B 42 data
ESC C n	Page Length Setting	1B 43 n
ESC D n data CR	Set Bar Code Data	1B 44 n data CR
ESC E	White on Black Printing	1B 45
ESC H	Text Mode Printing	1B 48
ESC I	Inverted Printing	1B 49
ESC K n	Graphics Printing	1B 4B n
ESC L n	Set Width Expansion Factor	1B 4C n
ESC N n	Set Vertical Expansion Factor	1B 4E n
ESC S n	Select Base Character Pitch	1B 53 n
ESC U d0 d1 n0 ... n47	User Defined Character Control	1B 55 d0 d1 n0 ... n47
ESC W	Black Printing	1B 57
ESC M n	Motion head	1B 4D n
	Clear Bold and Underline	1b 10 01

Command	Function	HEX
	Set Bold attribute	1b 10 02
	Clear Bold attribute	1b 10 03
	Set Underline attribute	1b 10 04
	Clear Underline attribute	1b 10 05
	Set size left margin	1b 10 06 n0 n1
	Set size space between characters	1b 10 07 n
	Set size space between lines	1b 10 08 n
	Enter horizontal page printing	1b 10 10
	Exit horizontal page printing	1b 10 11
	Set number characters per line	1b 10 12 n
	Set horizontal page Left mode	1b 10 13
	Set horizontal page Right mode	1b 10 14
	Clear horizontal page	1b 10 15
	Printing horizontal page	1b 10 16
	Set national fonts	1b 10 20 n
	Set format of code bar PDF417	1b 10 30 n
	Set data of code bar PDF417	1b 10 31 data

6. Appendix

6.1. Appendix A

Connecting your Printer to a Computer

Voyager 2000 printer uses a communication interface employing serial data transmission implemented in accordance with the Electronics Industry Association's RS-232C standard.

Asynchronous data transmission has been implemented.

Frame contains start bit, 8-bit data field, one stop bit.

The data frame doesn't contain a parity control bit.

Data transmission may be set to 9600, 19200, 38400, 57600, 115200 bit.

The interface has been significantly simplified because in the communication interface only the signals necessary for implementing asynchronous character transmission were used.

The serial interface is based on 9-pin interface model (Canon DB-9).

This is adequate for the number of signals used.

Besides standard signals as defined in RS-232C standard, there is a printer-to-computer signal implemented in the interface.

The signal allows Voyager 2000 automatic communication redirection to RS-232 and connection quality testing.

In DB-9 interface, pin 1 works with the signal.

On the computer end the pin has to be grounded.

For the printer, absence of ground signal on the pin means no connection via RS-232.

Interface pin assignment is shown in **Blad! Nie mozna odnalezc zródla odsylacza.**.

Table 4.   RS232 Interface Pin Assignment

Pin number	Signal in pursuance of PN-75/T-05052	Meaning
1	DCL,RLSD	Connection detection.
2	RxD	Receiving data.
3	TxD	Transmitting data
4	DTR	Not used
5	SG	Ground
6	DSR	Not used
7	RTS	Receiving ready
8	CTS	Transmission ready
9	RI	Not used

6.2. Appendix B

Control Codes – Voyager 40DT Compatibility

The control codes implemented in the Voyager 2000 printer are entirely compatible with the control codes of Voyager 40Dt printer that has been stripped of any label functions.
Furthermore, some codes have been added to allow implementation of Voyager 2000 specific functions.
This makes the Voyager 2000 control code set a super-set of the Voyager 40Dt code set.
This makes it possible to produce data printout of the older printer format.
You can take advantage of this continuity and use a Voyager 2000 printer in place of a Voyager 40Dt.

6.3.   Appendix C

Wake-Up via Parallel Interface

One important feature of the printer is an option that allows the printer to be turned on by a signal received via serial interface.
We call this way of turning the printer on "waking it up."
The concept of waking up is closely connected to so-called period of waking (t_b).
The Period of Waking is defined as the minimal time the printer needs to go into work-ready state after a signal is sent via the serial port.
The trigger in the procedure of waking up the printer is a series of zeroes (00 HEX).
The number of characters needed depends on the speed of data transmission.
There are two ways to execute the process of waking up the printer.
The first (recommended) way goes as follows:

* 00H character sent N_{tb} times

* Transmission brake for about 100 ns

* Actual data transmission

    The second (not recommended) way goes as follows:
* 00H character sent N times

* Actual data transmissio

Table 5.   Printer Wake-Up Parameters

Transmission speed [bd]	N_{tb}	N
9600	2	96
19200	4	192
38400	8	384
57600	12	576
115200	24	1152

6.4. Appendix D

ASCII Character Table

All other tables are based on this one.

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0			SP	0	@	P	'	p	Ç	É	á	¦	+	-	a	≡
1			!	1	A	Q	a	q	ü	æ	í	¦	-	-	ß	±
2			"	2	B	R	b	r	é	Æ	ó	¦	-	-	G	≥
3			#	3	C	S	c	s	â	ô	ú	¦	+	+	p	≤
4			$	4	D	T	d	t	ä		ñ	¦	-	+	S	⌠
5			%	5	E	U	e	u	à	ò	Ñ	¦	+	+	s	⌡
6			'	6	F	V	f	v	å	û	ª	¦	¦	+	µ	÷
7			(	7	G	W	g	w	ç	ù	º	+	¦	+	t	≈
8			)	8	H	X	h	x	ê	?	¿	+	+	+	F	°
9			*	9	I	Y	i	y	ë	Ö	¬	¦	+	+	T	·
A	LF		+	:	J	Z	j	z	è	Ü	¬	¦	-	+	O	·
B		ESC	,	;	K	[	k	{	ï	¢	½	+	-	¦	d	√
C			-	<	L	\	l	|	î	£	¼	+	¦	_	∞	n
D	CR		.	=	M	]	m	}	ì	¥	¡	+	-	¦	ø	²
E			/	>	N	^	n	~	Ä	Pt	«	+	+	¦	∈	¦
F				?	O	_	o	SP	Å	ƒ	»	+	-	‾	∩	SP

International Characters

	N	35$_D$ / 23$_H$	36$_D$ / 24$_H$	64$_D$ / 40$_H$	91$_D$ / 5B$_H$	92$_D$ / 5C$_H$	93$_D$ / 5D$_H$	94$_D$ / 5E$_H$	96$_D$ / 60$_H$	123$_D$ / 7B$_H$	124$_D$ / 7C$_H$	125$_D$ / 7D$_H$	126$_D$ / 7E$_H$
USA	0	#	$	@	[	\	]	^	'	{	|	}	~
FRANCE	1	#	$	à	°	ç	§	^	'	é	ù	è	"
GERMANY	2	#	$	§	Ä	Ö	Ü	^	'	ä	ö	ü	ß
UK	3	£	$	@	[	\	]	^	'	{	|	}	~
DENMARK1	4	#	$	@	Æ	Ø	Å	^	'	æ	ø	å	~
SWEDEN	5	#	¤	É	Ä	Ö	Å	Ü	é	ä	ö	å	ü
ITALY	6	#	$	@	°	\	é	^		à	ò	è	ì
SPAIN	7	Pt	$	@	¡		¿	^	'	"	ñ	}	~
JAPAN	8	#	$	@	[	¥	]	^	'	{	|	}	~
NORWAY	9	#	¤	É	Æ	Ø	Å	Ü	é	æ	ø	å	ü
DENMARK2	10	#	$	É	Æ	Ø	Å	Ü	é	æ	ø	å	ü
LATIN2	11	#	$	@	[	\	]	^	'	{	|	}	~
MAZOVIA	12	#	$	@	[	\	]	^	'	{	|	}	~

Polish National Characters

	A	C	E	L	N	Ó	S	Z	Z	a	c	e	l	n	ó	s	z	z
Mazovia	143 D$8F_H$	149 D95_H	144 D90_H	156 D$9C_H$	165 D$A5_H$	163 D$A3_H$	152 D98_H	160 D$A0_H$	161 D$A1_H$	134 D86_H	141 D$8D_H$	145 D91_H	146 D92_H	164 D$A4_H$	162 D$A2_H$	158 D$9E_H$	167 D$A7_H$	166 D$A6_H$
Latin II	164 D$A4_H$	143 D$8F_H$	168 D$A8_H$	157 D$9D_H$	227 D$E3_H$	224 D$E0_H$	151 D99_H	189 DBD_H	141 D$8D_H$	165 D$A5_H$	134 D86_H	169 D$A9_H$	136 D88_H	228 D$E4_H$	162 D$A2_H$	152 D98_H	190 DBE_H	171 DAB_H

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