DATECS

EP-60
ESC/POS Thermal Printer
User's Manual

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Introduction

DATECS EP-60 is an ESC/POS printer with a wide variety of applications.

DATECS EP-60 is developed for integration into communication terminals, POS systems, hospitality systems, etc.

Datecs EP-60 allows fast printing of regular text as well as graphics, specified by the end user – bar code, company logo, etc.

Datecs EP-60 is the newest in Datecs line of ESC/POS printers.

FEATURES:

〉 Compact and lightweight design

〉 High-speed printing – up to 150 mm/sec

〉 Easy paper loading

〉 Low-noise printer mechanism even at high printing speeds

〉 Supports text and graphics printing

〉 Bar code printing

〉 Auto cutter mechanism provided as standard

〉 Paper feed sensors

〉 High reliability and secure operation

〉 Operates horizontally and vertically (hanging on a wall)

INTERFACES:

〉 Serial RS-232

〉 USB

Technical Specifications

Parameter		Description
Print	Print Method	Line Thermal Dot Printing
	Print mechanism with Auto cutter	CAPG247A-E Seiko Instruments
	Dot Density	203 dpi (8 x 8 dots/mm)
	Dot spacing	Horizontal – 0.125 mm (8 dots/mm) Vertical – 0.125 mm (8 dots/mm)
	Max print width	54 mm / 432 dots per line
	Characters per line	36 – for A and C Fonts 48 – for B and D fonts
	Paper feed	Step wise
	Print speed (Max.)	150 mm/s (1200 dots/sec)
Character	Internal	Font A: 12 x 24 dots Font B: 9 x 16 dots
	Loadable	Font C: 12 x 24 dots Font D: 9 x 16 dots
Thermal paper	Width, mm	58
	Outer roll diameter, mm	max 83
	Max. thickness, μm	max 80 (65-80 μm)
Bar Code support	1D	EAN 13, EAN 8, UPC A, UPC E, Codabar, Code 39, Code 93, Code 128, Interleaved 2 of 5
	2D	PDF417
Logo	1 Black & White	Dimensions 432 x 544 dots
Electronic components	Processor	H8S2350 – HITACHI
	Flash memory – 8Mbit	29F800DB
	RAM – 4Mbit	K6X40008CIF – SAMSUNG
Interface	Serial	RS 232 – max 115200 bps
	USB	USB type - emulated COM port
Emulation	ESC/POS	Work with continuous paper

Input buffer		32 KB
Power supply	AC/DC adapter	DC 24V/2A
Operation	Button FEED	- Paper feed - Status information
	Switch ON/OFF	Power ON/OFF
Power Supply control		ON/OFF
Weight, g	Without paper:	550
Dimensions (mm)	(W) x (L) x (H)	111 x 185.5 x 127.5
Environment	Operating	Temperature from 0°C to 40°C Humidity from 30% RH to 80% RH
	Storage	Temperature from -20°C to 60°C Humidity from 20% RH to 90% RH
Cables		RS232 interface cable
	Option	USB cable A to B cable

Safety and operation instructions

Instructions which have to be followed precisely

⚠ **Warning**	**Negligence of this precaution may result in problems during work with the printer.**
⚠ **Caution**	**Negligence of this precaution may result in damage to the printer.**

⚠ **Warning**

- Read the user manual for EP-60 carefully before installing the printer and using it. Always refer to the manual when necessary.

- Do not allow any objects into the printer. This may cause serious problems.

- Do not allow water or any other fluids (tea, coffee, juice, etc.) to be spilled on the printer. Prevent spray from deodorant or any other type from entering the printer. If this happens turn the printer off and call your authorized dealer.

- Transport the printer carefully. Dropping it may cause damage.

- Don't clean the surface of the printer with thinner, gasoline, ketone or other similar chemicals.

- Operate the control panel correctly. Careless or rude exploitation may cause problems. Don't use sharp objects while operating the printer.

- If problems occur during print turn the printer off immediately. Do not try to disassemble and repair the printer by yourself. Contact your authorized dealer.

- Don't disassemble or modify the printer.

After unpacking the printer throw away or safely store the polyethene packing away from children.
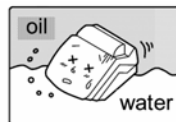
Working environment requirements
Do not expose the printer to:

Dust

Strong vibrations

High humidity or oil vapor

Direct sunlight

Temperatures over 40˚C Degrees

Temperature below 0˚C Degrees

Strong electromagnetic disturbance or corrosion

Humidity over 80%

Places with high temperature drops or condensation corrosion

DATECS WARNS:

- Datecs reserves the right to change the contents of this manual without preliminary warning.
- The information in this manual may not be copied or reproduced by any means and under any circumstances, without a written preliminary agreement with Datecs Ltd.
- Datecs Ltd is not responsible for failures, occurred due to the use of accessories, other than the ones, originally specified for the printer.
- Don't mount, dismount or try to repair parts of the printer, which are not specifically mentioned in the User's manual.
- Datecs Ltd is not responsible for failures, occurred while using the printer in inappropriate working environments and under unsuitable conditions.
- Datecs Ltd is not responsible for damage, missed advantages or loss of data, resulting from technical failure.
- Datecs Ltd kindly asks you to signalize in time for occurred mistakes, misses or inaccuracies in the User's manual. We will be very grateful!

Box Contents

When unpacking the printer, confirm that the following are provided:

Item	Descriptions	Image
1	Thermal printer EP-60	
2	Adapter	
3	Sample paper roll	
4	User's Manual	
5	Drivers for EP-60	
6	RS-232 cable	
7	USB a to B cable	

Note:
The up-to-date version of the included software, drivers and support are uploaded on the website of **Datecs www.datecs.bg** and can be downloaded for free.

About the printer EP-60

Front/right view

① ON/OFF switch

② FEED button

③ Control panel

④ POWER indication

⑤ ERROR indication

⑥ Paper cover

⑦ Paper cover release button

⑧ Manual auto cutter control
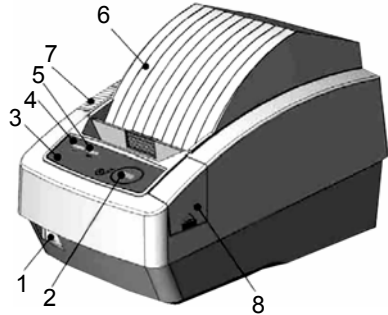
Bottom view

⑨ Slots for hanging – they are designed
for hanging the printer (on a wall)
for work in vertical state (hanging).
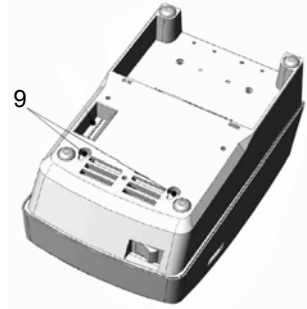
Front view / Control Panel / Indications

❶ **POWER indication**
Lights green when the printer
is switched on
Blinks when the printer
head has overheated

❷ **ERROR indication**
Blinks red (once per
second) when out of paper.
Blinks red (five times per second) - problem with the Auto Cutter.

❸ **FEED button**
The functions of the FEED button are described below in the section "Feed
button functions"
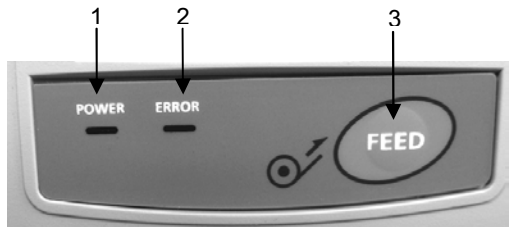
Back view / connectors
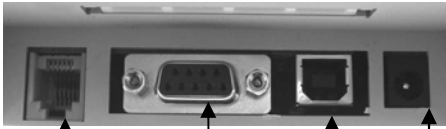
Drawer connector | RS-232 connector | USB connector | AC/DC adapter connectors

FEED Button Functions

Button	Operation		
FEED	**1.** Pressing this button feeds paper until it is released		
	2. Pressing and holding the feed button while switching the printer on – then releasing the feed button (after a number of sound signals)		Prints extended SELF TEST
		After ~4.5 sec. and after the 3rd signal mode	The printer enters Hex DUMP
		After ~8.5 sec. and after the 5th 4-tone signal	Programming mode – loading of firmware
	3. Renews printing after changing the paper roll **4.** Pressing the feed button after lock of the auto cutter initiates an attempt to release the cutter and to renew printing.		

LED's

Indication	Option
POWER	1. Lights permanently green when the printer is switched on. 2. Blinks green and the printer stops printing when the head has overheated. When the printer head cools down the LED lights permanently green and the printer continues printing.
ERROR	1. Blinks red (once per second) when out of paper 2. Blinks red (five times per second) when the Auto Cutter is locked. After releasing the cutter the LED stops blinking and the printer continues to print. 3. When pressing and holding the feed button while switching the printer on turning it blinks red after every sound signal. After releasing the button, depending on how long it has been pressed, the printer behaves as described above (see. Feed button functions).

DIP switches

DIP switches location

The location of the hardware switches is shown on the picture below.
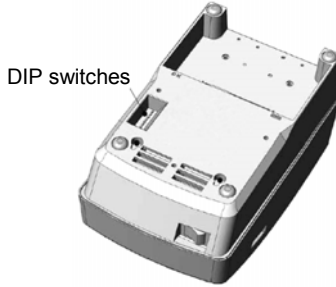
DIP switches

Functions and settings of the DIP Switches

SW1	SW2	SW3	Baud rate (bps)
OFF	OFF	OFF	1200
ON	OFF	OFF	2400
OFF	ON	OFF	4800
ON	ON	OFF	9600
OFF	OFF	ON	19200
ON	OFF	ON	38400
OFF	ON	ON	57600
ON	ON	ON	115200

	OFF	ON
SW4	Auto Cutter disabled	Auto Cutter enabled
SW5	Standard commands	Extended commands

SW6	SW7	SW8	Code page
OFF	OFF	OFF	Uses the flash setting, **ESC t** enabled
OFF	OFF	ON	USA CP437
OFF	ON	OFF	Bulgarian CP856
OFF	ON	ON	Russian CP866
ON	OFF	OFF	Latvian
ON	OFF	ON	Lithuanian
ON	ON	OFF	Polish
ON	ON	ON	Uses the flash setting, **ESC t** disabled

In the Chinese version of the printer only Sw8 is defined for changing the code table:

SW6	SW7	SW8	Code page
N/A		OFF	USA CP437
N/A		ON	Chinese GB2312

In the Arabic version of the printer only Sw8 is defined for changing the code table:

SW6	SW7	SW8	Code page
N/A		OFF	USA CP437
N/A		ON	Farsi Code Table

Serial Interface

⚠ **Caution**	Turn off the printer before attaching the serial interface cable.

Baud rate	1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200 bps
Serial port parameters	1 start bit, 8 data bits, 1 stop bit, no parity
Signal characteristics	RS 232C Mark – logical 1 (-3V to –12V) Space – logical 0 (+3V to +12V)

Input-output Signals

RD	Serial input data signal
TD	Serial output data signal. Used under XON/XOFF protocol and for returning of printer status
GND	Serial Data output. Used under XON/XOFF protocol and for returning of printer status

Signal Description

| Start bit	One "Space" level bit. Indicates the beginning of data byte.
Data bits	Eight consequent bits. First is the least significant bit.
Stop bit	One "Mark" level bit. Indicates the end of the byte.

Date Flow control

If a software (XON/XOFF) protocol is selected the printer sends special characters – **XON (11h)** to enable and **XOFF (13h)** to disable transmission.

Paper Loading

EP-60 uses thermal paper rolls for printing. The width and the diameter of the paper roll are listed in the printer's technical specifications. EP-60 uses the so called "clamshell" system for changing paper rolls, which enables a fast and easy change. In order to place a new paper roll all you need to do is to press paper cover release button, open it and place the new roll as shown on the picture below.

① Press the Paper cover release button
② Open the cover
③ Place the new paper roll
④ Close the Paper cover
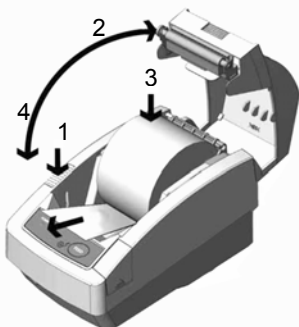
| ⚠ Caution	The thermal paper roll has to be placed as shown on the picture – the thermal layer must be on the outer side of the roll and on the side of the printer unit head.

⚠ Warning	Pull out 12 mm or more paper before you close the cover.

AUTO cutter

EP-60 has an Auto cutter mechanism provided as standard.
The Auto cutter is controlled with the commands **ESC i** and **ESC m**.

① Auto Cutter
② Manual Auto Cutter control section cover
A Manual Auto Cutter control section
③ Wheel for manual Cutter movement, for release after locking
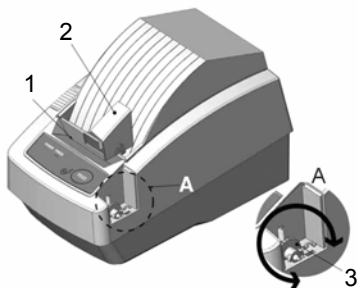
⚠ **Caution**	When the Auto Cutter locks (the ERROR indication starts blinking red 5 times per second and printing stops) proceed as follows:
	1. Press the Feed button in order to initiate an attempt to release the cutter and to continue printing.
	2. If the above does not help, open the cover (2) of the manual auto cutter control section and turn the wheel in either direction (as shown on the picture) until the cutter is released. Then press the **FEED** button to return the cutter in its original state and to continue printing.
	After release of the Cutter printing proceeds.

Paper feed sensors

EP-60 has two paper feed sensors. Either of the sensors is used depending on how the printer is situated – horizontally or vertically (hanging).

① Paper feed sensor for horizontal state.

② Paper feed sensor for vertical state.

③ Sensor 1 regulation

④ Sensor 2 regulation
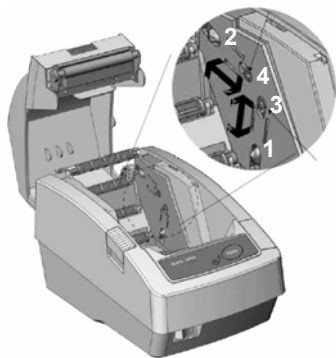
⚠ **Warning**	Depending on how the printer is situated and on the type of paper roll used, regulate the sensors so that the end of the roll can be identified.

Extended SELF TEST print

Press and hold the **FEED** button while turning the printer **ON**, then release the feed button. An extended SELF TEST, containing the following information, will be printed out:

〉 all internal and loadable characters

〉 number of characters per line for the different fonts

〉 examples of printed text under different parameters (normal, half black, bold, italic, underlined, inverted, rotated by 90 degrees, rotated by 180 degrees, different sizes characters)

〉 characters table

〉 supported bar codes

〉 print density

〉 printer head temperature

〉 country

〉 code page

〉 Euro position

〉 state of ESC t (enabled/disabled)

〉 data transfer speed

〉 DIP switch settings

Frequently occurring problems

The most frequently occurring problems while operating EP-60 are described in the table below:

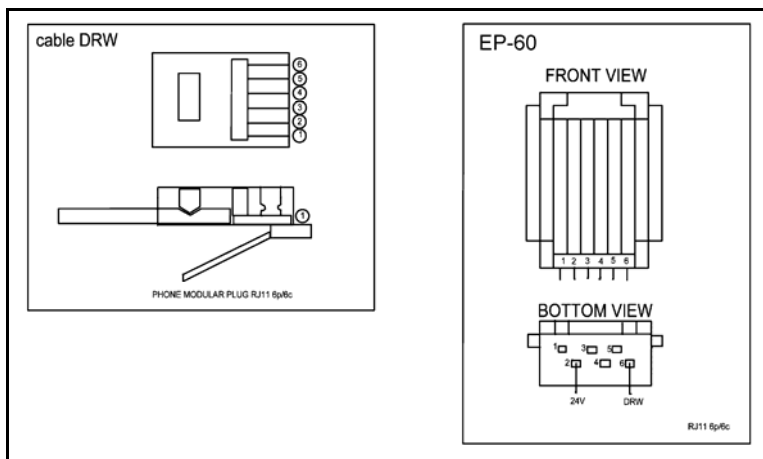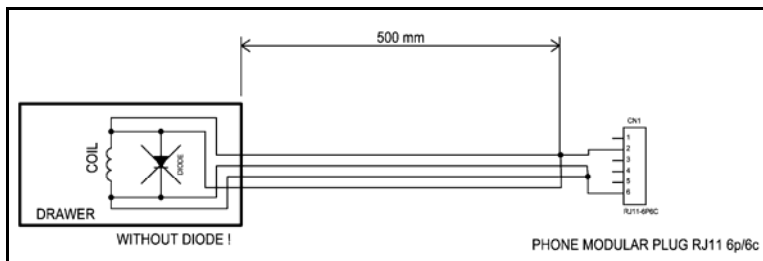| No.	Problem	Probable cause
1.	When sending a print command the paper moves but no print occurs	The paper roll has been placed incorrectly – the thermal layer is not on the side of the printer head. Place the paper roll correctly as described in the section "Paper loading".
2	The ERROR indication blinks red once per second	Out of paper. Change the paper roll.
		The paper roll is placed incorrectly. Place the paper roll correctly as described in the section "Paper loading".
3	The ERROR indication blinks five times per second	The Auto cutter is locked. Press the FEED button, in order to initiate an attempt to release the cutter. If this doesn't work release the cutter manually, as described in the section "Automatic Paper Cutter".
4	The POWER indication blinks green and the printer stops printing	Printer head overheated. After the print head cools off, the power indication light permanent green and the printer continues to print.
5	Fade or missing print covering only half of the printing area	The Paper cover is not fully closed. See section "Paper loading".
		If the Paper cover is fully closed and the problem continues, contact your authorized dealer.

Command List

No.	Command	Function
1	BEL	Sounds the beeper
2	HT	Horizontal tab command
3	LF	Printing and paper feed
4	CR	Print command
5	ESC RS	Sounds the beeper
6	ESC SP	Setting the right space amount of the character
7	ESC #	Setting the Euro symbol position
8	ESC $	Specifying the absolute positions
9	ESC %	Selecting user character set
10	ESC &	Define user characters
11	ESC !	Collective specifying printing mode
12	ESC *	Specifying the bit image mode
13	ESC -	Specifying/cancelling underline
14	ESC .	Self test / demo
15	ESC ,	Printing diagnostic information
16	ESC 2	Specifying 1/6-inch line feed rate
17	ESC 3	Setting line feed rate of minimum pitch
18	ESC 8	Temporary store current print settings
19	ESC 9	Restore saved printer settings
20	ESC =	Data input control
21	ESC >	Set Factory Defaults
22	ESC @	Initializing the Printer
23	ESC D	Setting horizontal tab position
24	ESC E	Specifying/cancelling highlighting
25	ESC G	Specifying/cancelling double printing
26	ESC I	Specifying/cancelling italic printing
27	ESC J	Printing and feeding paper n/203 inch
28	ESC M	Selecting character font A or B
29	ESC R	Setting the international character set
30	ESC V	Specifying/canceling 90°-right-turned characters
31	ESC X	Select maximal printing speed
32	ESC Y	Selecting intensity level
33	ESC Z	Transmits identification string
34	ESC \	Specifying the relative positions
35	ESC _	Restore factory settings
36	ESC `	Transmits current battery voltage and the print head temperature

37	ESC a	Aligning the characters
38	ESC c5	Enabling/disabling the panel switches
39	ESC d	Printing and feeding the paper by n lines
40	ESC i	Cutting the paper
41	ESC m	Cutting the paper
42	ESC p	Generating a drawer-kick pulse
43	ESC t	Selecting the character code table
44	ESC v	Transmitting the printer status
45	ESC x	Reversing the print direction
46	ESC {	Specifying/canceling the inverted characters
47	GS (A	Printing a self-test
48	GS B	Specifying/canceling the black/white inverted printing
49	GS L	Setting the left margin
50	GS V	Cutting the paper
51	GS k	Printing the bar code
52	GS w	Selecting the horizontal size (scale factor) of bar code
53	GS h	Selecting the height of the bar code
54	GS H	Selecting of print position of HRI code
55	GS f	Selecting the font of HRI code
56	GS p	Setting bar code PDF-417 parameters
57	GS v 0	Printing of raster bit image
58	GS *	Defining the downloaded bit image
59	GS /	Printing the downloaded bit image
60	GS :	Starting/ending macro definition
61	GS ^	Executing the macro
62	FS p	Printing the downloaded NV bit image
63	FS q	Defining the downloaded bit image

Appendix

Drawer cable for EP-60

RS232 Cable for PC