IF-9000
Interface for CAP9000/LTP9000

Technical Guide

(TENTATIVE)

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PREFACE

The IF-9000 is an interface circuit for printing data on a series LTP9000 and CAP9000 printers mechanisms. The interface supports autocutter control functions and paper autoloading functions.
The interface handles many types of printing including text printing - 40 columns of ordinary characters, 80 columns condensed characters, 20 columns of double-with characters, bold and double-strike characters as well as graphic and barcode printing. Since the software commands contains many control codes, they can be used independently.
The IF-9000 consist the three switches SW for selecting the functions and two LED (Blue and Red) for status indication.

General specifications

Applicable model	CAP9247, LTP9247	CAP 9347, LTP9347
Character matrix	8 X 9, 8 x 14, 10 x 24, 12 x 24 dots	
Character set	Latin 2 PC	
Character per line	20,40,80	
Dot resolution	8 dots/mm	
Printable dot number	448 dots	640 dots
Line spacing	0.125 mm	
Control	RS-232 – Serial, USB	
Buffer size	64Kb	
Barcodes	Interleaved 2/5, EAN-13	
Printing speed	max. 120 mm/s	max. 100mm/s
Operating voltage	24V +/-5% DC	
Operation conditions	-20 +50C, 10-90% RH	
External dimensions (mm)	108 mm (W)× 90 mm (D)× 28 mm (H)	
Weight	approx. 90g	
ROHS	ROHS Compliant	
Warranty	2 years	

Print Test

To execute a print test please follow this procedure:
Turn off the power
Make sure the paper is inserted correctly
Turn on the power while pressing the Paper Feed button to start the self test.
Release the FEED button as soon as the self test starts.
Print sample

The printer stops automatically after the test print. Do not turn of the printer while is printing.

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Thermal Printer VLTP-80

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Specifications:

-mechanism:        CAP9000(SII)
-printing speed:   max 100mm/sec
-printing method:  line thermal
-printing density: 8 dots/mm
-printing width:   104mm
Paper width:       112mm
Data bufer size:   32KB or 64KB
Character matrix:
8x9,8x14,10x24,12x24 dots
IBM set2 with polish latin2 pc
Interface:         RS232C
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Internal switch bank setting

Baud rate:
DIP4 on   1200  9600 19200 115200
DIP4 off 19200 38400 57600 115200
DIP1      on    off   on    off
DIP2      on    on    off   off
DIP3      on    cutter off
          off   cutter on
DIP4      on    text mode
          off   graphics mode
Characters per line:
          69    83   104(1) 104(2)
DIP5      on    off   on    off
DIP6      on    on    off   off
DIP7      on    CR -> CR+LF
          off   CR -> CR
DIP8      on    reverse printing
          off   normal printing
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Printer function

Buffer Full Printing

The IF-9000 printer has a 64 KB line buffer to receive data. If data with more columns then one line is received, printing will start, even if there is no print command.

Control codes

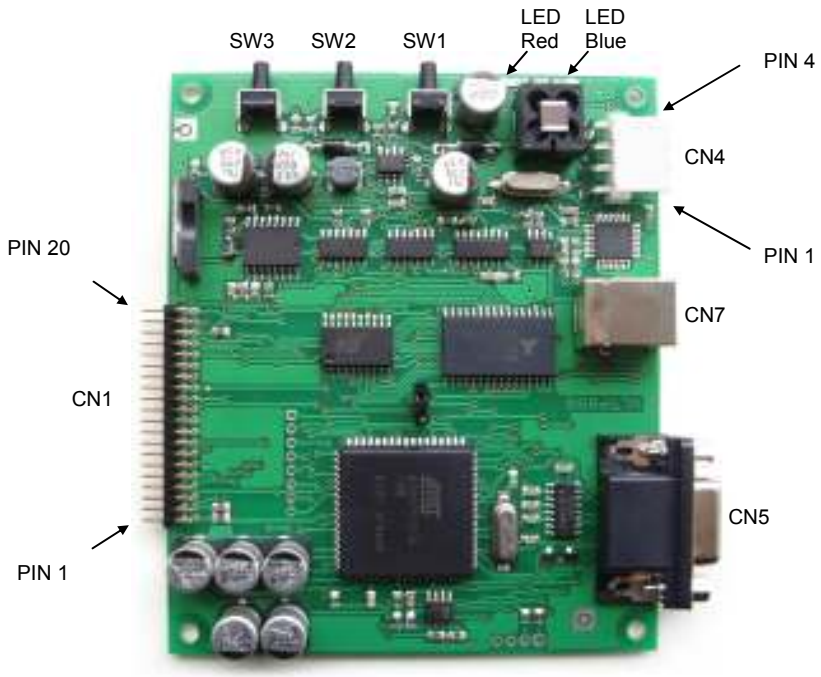
The IF-9000 uses control codes to change forms and characters. The control codes are not printed. There are two types of function codes: basic functions codes that can be used independently and extended function codes used with the ESC Sequence.
Non-defined codes are ignored.

Sequence codes

Command	Function
LF	Printout line and feed the paper one line
CR	Feed the paper one line
SO	Set the double-width print for one line
DC4	Cancel the double-width print for one line
ESC n1B 33 n	Set the vertical spacing in 203/n x 0.125 mm (n=1 to n=255)
ESC @ 1B 40	Initialize the printer. The default (current) parameters are on the routine printout
ESC J n 1B 4A n	Perform n/203 Line Feed. Shifting paper by n x 0.125 mm (~ n/203 of an inch increments), (graphic mode).
FF	Form Feed. Shifting paper by 100 mm, (graphic mode).
ESC 2 1B 32	Set 32 Characters / line
ESC 4 1B 34	Set 38 Characters / line
ESC 8 1B 38	Set 48 Characters / line for matrix 8 x 9 dots
ESC 9 1B 39	Set 48 Characters / line for matrix 8 x 14 dots
ESC W n 1B 57 n	Horizontal Enlargement ON/OFF. “n” between n=1 and n=5. “n=1” cancels enlargement
ESC] Q n 1B 5D 51 n	Vertical Enlargement ON/OFF. “n” between n=1 and n=5. “n=1” cancels enlargement.
ESC] P<barcode_data> 1B D 50	Barcode EAN-13 printing
GS k 1D 6B	Barcode “interleaved 2/5” printing. The <length> always equal 4 pairs characters
ESC V 0x00 0x01 <data> 1B 56	Printing a whole row of 1-line Graphics with paper feed. The number of data bytes is equal to 48, which corresponds to the whole width of a line (384 dots). The next line is printed under previous one(, graphic mode).
ESC Q n 1B 51 n	Change quality of printout, (graphic mode). When n=1 printout NLQ (high quality and half standard speed). When n=0 printout Standard (standard quality and fast speed).
ESC] c n 1B 63 n	Printout “n” number of times. G The ESC] c n code should be sent before the last the FF code
ESC v n 1B 76 n	Select text mode / graphics mode. n=0 text mode, n=1 graphics mode
ESC i 1B 69	Full Cut of the Paper

ESC m 1B 6d	Partial Cut of the Paper
Kod = 18 Hex (dec. = 24)	Bit 0 – Not used Bit 1 - Paper Bit 2 - Temperature Bit 3 - Head Bit 4 - Autocuuter Bit 5 – Not used Bit 6 – Near End of Paper (NEP) sensor Bit 7 – Not used When Bit (N) = "0" Error not occurred When Bit (N) = "1" Error of the upper mentioned component When error is not occurred STATUS = 00

Pinouts and functions



Function Settings

The IF-9000 consist the three switches SW1 to SW3 for selecting the functions. Using the switches you can select functions and change the parameters. The function and parameters are stored in Flash memory, and stored until new changing.
The status indication of the interface is shown by two LED Blue and Red.

Printer status signal

Printer status	LED 1 Blue	LED 2 Red
Power Off	Light out	Light out
Power On	Lighting	Light out
Out of paper error	Blinking	Light out
Hardware error		
Autocutter error		
Paper jam error		
Platen open error		
Thermal head temp. error		

Dip Switches Descriptions

Switch No	Function	Description
SW1	Used in DIP switches setting mode	
SW2		
SW3	Feed	Paper feed

In order to activate DIP switches setting:

1. **Turn off the printer**
2. **Hold SW2 and turn on the printer**
3. **After 2 seconds release SW2**
   DIP : [DIP SW setting mode] will be printed
4. **Enter DIP switches by pressing SW1 or SW2**
   SW1: ON setting
   SW2: OFF setting
   DIP switches are set from SW8 (first) to SW1 (last)
   After last parameter (SW1) DIP SW setting complete !! is displayed

When **SW4** is ON:

Baudrate	Switch No	
	SW1	SW2
1200	ON	ON
9600	OFF	ON
19200	ON	OFF
115200	OFF	OFF

When **SW4** is OFF:

Baudrate	Switch No	
	SW1	SW2
19200	ON	ON
38400	OFF	ON
57600	ON	OFF
115200	OFF	OFF

Switch No	Function	ON	OFF
SW3	Cutter	Cutter off	Cutter on
SW4	Printing Mode	text mode	graphics mode

Text Mode

Characters/line	Switch No	
	SW5	SW6
69	ON	ON
83	OFF	ON
104(1)	ON	OFF
104(2)	OFF	OFF

Connectors

Power Supply Connector CN4

Connector CN 4

Pin no.	Signal	I/O	Function
1	V_P	Input	Power supply (+24V)
2	V_P	Input	Power supply (+24V)
3	GND	-	GND
4	GND	-	GND

Printer Mechanism Connector CN1

Connector CN 1

Terminal No.	Signal Name	I/O	Function
1A	V_{PS}	Output	Power supply for the paper sensor
1B	PS	Input	Paper sensor signal
2A	V_{MS}	Output	Power supply for the paper mark sensor
2B	MS	Input	Paper Mark sensor signal
3A	HV_P	-	Head common power
3B	HV_P	-	Head common power
4A	HV_P	-	Head common power
4B	HDATA	Output	Head data signal (serial)
5A	CLOCK	Output	Head data lock signal
5B	!LATCH	Output	Head data latch signal
6A	!DST1	Output	1st block / head strobe signal
6B	!DST2	Output	2nd block / head strobe signal
7A	!DST3	Output	3rd block / head strobe signal
7B	!DST4	Output	4th block / head strobe signal
8A	TH	Input	Thermistor signal
8B	GND	-	GND
9A	GND	-	GND
9B	GND	-	GND
10A	GND	-	GND

10B	GND	-	GND
11A	GND	-	GND
11B	GND	-	GND
12A	V_{CC}	Output	Head logic power (5V)
12B	!DST5	Output	5th block / head strobe signal
13A		Output	6th block / head strobe signal
13B		Output	7th block / head strobe signal
14A	HV_P	-	Head common Power
14B	HV_P	-	Head common Power
15A	HV_P	-	Head common Power
15B	HV_P	-	Head common power
16A	A	Output	Motor driver signal
16B	!A	Output	Motor driver signal
17A	B	Output	Motor driver signal
17B	!B	Output	Motor driver signal
18A	HS	Input	Platen position sensor signal
18B	GND	-	Platen position sensor GND
19A	CMOT+	Output	Autocutter motor drive signal (+)
19B	CMOT-	Output	Autocutter motor drive signal (-)
20A	CS	Input	Cut sensor signal
20B	GND	-	Cut sensor GND

Notice: When connecting interface cable please connect cable column 1 with PIN 1A,1B and column 20 with PIN 20A, 20B. Incorrect connection of interface cable with damage the thermal mechanism and/or interface board.

Interface Specification

Serial interface

Signal condition (Comply with EIA RS 232-C)

CONDITION	**SIGNAL LEVEL**	
ITEM	Low	High
Binary State	“1”	“0”
Signal Condition	Marking	Spacing
Function	Off	On

Absolute Maximum Ratings

INPUT : +/- 30 V
OUTPUT : +/- 30 V

Data Speed

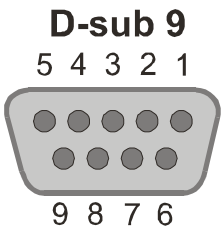
1200 to 115200 bps

Synchronous System

1.Asynchronous
2.Start-bit : 1 bit (binary “0”)
3.Data : 8 bit
4.Parity : Non Parity
5.Stop-bit : 1 bit

Connector CN 5

1. Part Name : D- Subminiature type connector with 9-pin Female
2. Part Number : RDED-(SE-9LN(05)
3. Standard : M2.6 Type
4. Manufacturer : HIROSE or equivalent



Connector CN 5 signal description

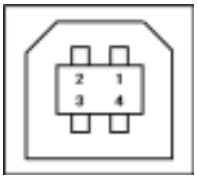
Pin no.	Signal	I/O	Function
1	-	-	Connected to pin 6 and 8
2	TDX	Output	XON/XOF Output
3	RXD	Input	Data reception
4	NC	-	Not used
5	GND	-	Ground
6	-		Connected to pin 1 and 8
7	NC	-	Not used
8	DTR	Output	Connected to pin 1 and 6
9	+5V	-	For external use (option)

USB interface

Driver: TBD

Connector CN 7

Pin no.	Signal	I/O	Function
1	V_{BUS}	-	USB Power supply
2	D-	In/Out	USB Data Signal
3	D+	In/Out	USB Data Signal
4	GND	-	GND



USB Series B Plug

Dimensions

Unit:mm