TP 2000

User Manual

COD. DOME-TP2000 Revision 1.10

Custom Engineering
Str. Berettine 2 - 43010 Fontevivo (PARMA) - Italy
Tel. : +39 0521-680111 - Fax : +39 0521-610701
http: www.custom.it Email : support@custom.it

"CE" Declaration of Conformity

In accordance with standards ISO/IEC Guide 22 and EN 45014

N°: DC0110196

Manufacturer's name: Custom Engineering s.r.l.

Manufacturer's address: Strada Berettine 2
Fontevivo (Parma)
Italy

Declares that the product:

Product name: Ticket receipt dispenser

Product type: TP2000

Model: TP2000

is in conformity with the following directives:

Electromagnetic Compatibility Directive 89/336/CEE; 92/31/CEE; 93/68/CEE

In accordance with the following standards:

EN 55022 Class B	Limits and methods of measuring the characteristics of radio disturbance produced by information technology equipment	1994
EN 50082-1	Electromagnetic compatibility - General immunity requirements. Part 1: Residential, commercial and light industry environments.	1992
EN 61000-4-2	Electrostatic discharge immunity tests. 4KVcontact discharge, 8KV air discharge	1995
EN 61000-4-4	Electrical fast transient/burstimmunity tests. Signal lines 0.5KV Power lines AC 1KV	1995
ENV 50140	Radio-frequency irradiated electromagnetic fields - Immunity test. 3V/m, 80MHz-1000MHz, 80% 1KHz AM	1993

January 1996

GENERAL INFORMATION REGARDING SAFETY

- Read and keep the following instructions.
- Observe all warnings and follow all instructions attached to the printer.
- Before cleaning the printer, disconnect the feed cable.
- Clean the printer with a damp cloth. Do not use liquid or spray products.
- Do not operate the printer near to water.
- Do not place the printer on unsteady surfaces. It could fall and get seriously damaged.
- Use the type of electricity supply marked on the printer label. In the event of uncertainty, contact the seller.
- Position the printer in such a way as to ensure that the cables connected to it will not be damaged.
- Ensure that the maximum absorbed current of the printer does not exceed the maximum acceptable current for the type of feed cable used.
- Do not put objects of any kind inside the printer as they could cause a short circuit or damage parts which could affect its performance.
- Do not spill liquids on the printer.
- Do not carry out technical operations on the printer with the exception of the scheduled maintenance operations specifically indicated in the user's manual.
- Disconnect the printer from the electricity supply and have it repaired by a specialized technician should any of the following conditions occur:
    A. The feed connector has been damaged.
    B. Liquid has penetrated to the inside of the printer;
    C. The printer has been exposed to rain or water;
    D. The printer is not operating normally despite the instructions in the user's manual having been followed.
    E. The printer has been dropped and its case damaged.
    F. The performance of the printer is poor.
    G. The printer does not work.

GENERAL SPECIFICATIONS

Power supply	+12 VDC
Current	
Medium	2A
Peak	4A
Serial interface	RS232 with DB9 connector
Parallel interface	Centronics (DB25)
Print mode text	35 and 42 column with 6x10 matrix
	17 and 21 column in double width mode
Image	210 dots/line

Environmental conditions	
Operating temperature	0°C - +50°C
Operating humidity	35% - 85%
Storage temperature /humidity	-20°C - +70°C / 10%-90%

- It is possible to print in image and text mode simultaneously with up to 14 software-selectable fonts available.
- Bidirectional printing
- Self Check
- Emergency stop
- Automatic printing with full line buffer
- Print color selection

J1 CUTTER CONNECTOR

No.	SIGNAL
1	Cutter position sensors
2	Cutter position sensors
3	GND
4	Cutter Motor 1 Control
5	Cutter Motor 2 Control

J4 POWER SUPPLY CONNECTOR

No.	SIGNAL
1	+12 – 14 VDC
2	GND

J5 RS232 SERIAL CONNECTOR

No.	SIGNAL	FUNCTION
1		
2	TX	RS-232 Data output
3	RX	RS-232 Data input
4		
5	GND	GND
6	DSR	Printer ON Indicator (+12 V active)
7		
8	RTS	Request to send
9		

J10 STEP MOTOR CONNECTOR

No.	SIGNAL
1	+12VDC Motor Neutral Wire
2	+12VDC Motor Neutral Wire
3	Phase 1
4	Phase 2
5	Phase 3
6	Phase 4
7	+5VDC
8	GND
9	Paper Signal (see J8)
10	Power on LED
11	n.c.
12	n.c.
13	+5 VDC
14	GND
15	Notch Signal (see J7)
16	Power on LED

This connector is EPSON M260-C-compatible, but it may also be used with other types of step motors. The photocell signals are on the connector.

J2 PRINTER CONNECTOR

No.	FUNCTION
1	Trigger magnet -
2	Trigger magnet +
3	Reset detector
4	GND
5	GND
6	Solenoid A
7	Solenoid B
8	Solenoid C
9	+12 VDC
10	+12 VDC
11	+12 VDC
12	Solenoid D
13	Solenoid E
14	Solenoid F
15	Solenoid G
16	+12 VDC Motor
17	Timing detect
18	Timing detect
19	Motor
20	n.c.

J6 KEYBOARD CONNECTOR

No.	SIGNAL	FUNCTION
1	VDC present LED	Output that activates the LED signalling 5VDC present.
2	Form Feed Key	Key normally open, when pressed during normal operation, advances the paper up to a given signal (see J7). If the printer does not encounter the signal, after a maximum number of lines, the paper feed stops automatically. This value is entered from the software. During programming, this key is used to confirm entry selection.
3	Line Feed Key	Key normally open, when pressed during normal operation,causes the paper to advance for as long as it is held down. If pressed during reset, the printer enters set-up. During set-up it is used to select the various options. (see PROGRAMMING)
4	On-Line LED	On-Line LED signal output. Remains lit during normal operation, but is off during test and set-up and when OFF-LINE.
5	On-Line Key	Key normally open, if pressed during reset, the printer will enter self-check mode. During normal operation, it is used to switch between ON-LINE and OFF-LINE. When OFF-LINE, the LED goes off, the printer registers busy and suspends printing of any job currently in progress.
6	GND	

J3 CENTRONICS PARALLEL CONNECTOR

No.	SIGNAL	FUNCTION
1	STROBE	A low-level impulse indicates that the data is ready to be read.
2	D0	Data 0
3	D1	Data 1
4	D2	Data 2
5	D3	Data 3
6	D4	Data 4
7	D5	Data 5
8	D6	Data 6
9	D7	Data 7
10	ACK	A low-level impulse indicates that the printer has received the data.
11	BUSY	A high-level signal indicates that the printer cannot receive data.
12	PE	Paper End
13	SELECT NOTCH	Always high, or alternately indicates the presence of paper under the photocell (see JP3).
14	n.u.	
15	ERROR	A low level indicates error status.
16	INIT	A low-level impulse causes the printer to reset.
17	GND	
18	GND	
19	GND	
20	GND	
21	GND	
22	GND	
23	GND	
24	GND	
25	GND	

J9 REWINDER CONNECTOR

No.	SIGNAL	FUNCTION
1	+12VDC MOTOR POWER SUPPLY	This connector is used to supply power to a paper winder. Voltage is present on pin 1 when the printer is ON.
2	GND	

J7 NOTCH SENSOR CONNECTOR

No.	SIGNAL	FUNCTION
1	LED POWER SUPPLY	Output for supplying power to the photocell LED.
2	NOTCH SIGNAL	This signal serves to register either the presence of a notch during FORM FEED or the position of the paper or receipt when being used as a dispenser. Paper presence signal 0=paper present 1= no paper
3	GND	
4	GND	

J8 PAPER SENSOR CONNECTOR

No.	SIGNAL	FUNCTION
1	LED POWER SUPPLY	Output for supplying power to the photocell LED.
2	PAPER SIGNAL	This signal serves to register either paper presence during printing or the position of the paper or receipt when being used as a dispenser. Paper presence signal 0=paper present 1= no paper Instead of a photocell, a microswitch may be used which, when paper is present closes pin 2 at ground. If neither a photocell nor a microswitch is desired, place a jumper between pins 2 and 3. **!!!!!!!! If no jumper or paper sensor are present, the MACHINE WILL NOT PRINT !!!**!
3	GND	
4	GND	

EMERGENCY STOP

If any one of the following problems arises during printer functioning, power is cut off to the motor, solenoids and trigger magnet and the ERROR signal is at LOW level. Simultaneously, the BUSY and RTS signals indicate that the printer is in use. Reset the printer to resume operation.

1) Motor frozen

2) Timing detector timeout

3) Reset detector timeout

SELF-CHECK - AUTOTEST

If the FORM FEED key is held down during power-up, the printer will carry out a self-check routine in which all font character sets will be printed out in continuous mode. To exit this routine, press the FORM FEED key a second time.

PROGRAMMING OPERATING PARAMETERS

To enter this routine, hold the LINE FEED key down during power-up. The machine will begin to print out all available fonts numbered 00 to 0x, a graphics test and, at the end, a machine status report.

Example:

PRINT DIRECTION NORMAL
PRINT MODE NORMAL
PARALLEL PORT
AUTOFEED OFF
SELECTED FONT No.00

with the following messages:

PRESS LINE FEED TO ENTER SET-UP
PRESS FORM FEED TO SKIP SET-UP

When FORM FEED is pressed, the machine exits the set-up routine and automatically resets to zero; if LINE FEED is pressed, the machine enters the set-up routine.
At this point, the LINE FEED key functions as a cursor for selecting the various functions and the FORM FEED key is used to confirm the parameters selected.

Table's parameters setting

PRINT DIRECTION	NORMAL REVERSE
PRINT MODE	NORMAL DOUBLE WIDTH DOUBLE HEIGHT EXPANDED
PARALLEL PORT	
SERIAL PORT	RATE 9600 4800 2400 1200 600 300
	PARITY NONE, BIT 8, STOP 1 PARITY NONE, BIT 8, STOP 2 PARITY NONE, BIT 7, STOP 2 PARITY EVEN, BIT 8, STOP 1 PARITY ODD, BIT 8, STOP 1 PARITY EVEN, BIT 7, STOP 1 PARITY ODD, BIT 7, STOP 1 PARITY EVEN, BIT 7, STOP 2 PARITY ODD, BIT 7, STOP 2
PROTOCOL	XON/XOFF RTS
AUTOFEED	OFF ON

When programming has been completed, the machine prints out a report with the new set-up parameters and automatically resets.

Control commands list

ASCII **CR**
Hex **0Dh**
Description **Carriage Return**
If AUTOFEED is ON, functions like the LF command; if OFF this command is ignored.

ASCII **LF**
Hex **0Ah**
Description **Line Feed**
When this command is received, all data in the line buffer is printed out. If the buffer is empty, the paper is fed one line.

ASCII **ESC d**
Hex **1Bh + 64h + n**
Description **Feed paper n lines**
When this command is received, < n > line feeds are carried out.
N.B.: This command does not print out the line buffer.

ASCII **ESC !**
Hex **1Bh + 21h + n**
Description **Select print mode**
This command selects the print mode. Depending on the status of the <n> bits, it activates or deactivates the double height, double width or underline options, where n1 :

bit 0 = 1 = double width
bit 1 = 1 = double height
bit 2
bit 3
bit 4
bit 5
bit 6
bit 7 = 1 = underline

ASCII **ESC R**
Hex **1Bh + 52h + n**
Description **Selects font to be used**
Selects one of the available fonts. This number is displayed during the start-up test. If <n> is greater than this number it is ignored.
This command permits the use of all available fonts during a single work session, but the printer will return to the default font following initialization.

ASCII **ESC @**
Hex **1Bh + 40h**
Description **Reinitializes the printer**
When this command is received, the printer resets and all default parameters are restored. Equivalent to turning the machine off and then on again.

ASCII **ESC ***
Hex **1Bh + 2Ah + m + n1 + n2 + data**
Description **Prints in image mode**
Prints a line in image mode. After this command has been received, the machine waits for the reception of (n2*256)+n1 bytes. The maximum number of dots per line is 210. A line printed in image mode is 8 dots high. Parameter <m> is a byte included for eventual future expansion which is not used and can therefore have any value.

Example:
To print a solid line 8 dots high and 210 dots long

<1Bh> <2Ah> <00h> <D2h> <00h> (210 * <FFh>)

ASCII **ESC K**
Hex **1Bh + 4Bh + n1 + n2 + n3 + n4 + n5 + data**
Description **Prints a graphic image**
This command allows for the printing in image mode of a graphic ((n4*256)+ n3) wide, n5 lines high and with a border offset of ((n2*256)+n1) dots. The number of dots per line is 210 and anything over this amount is read but not displayed. Therefore, it is important to make sure that the margin offset plus line length does not exceed the maximum allowed.

Example:
To print a square 80*80 dots, 100 dots from the border
<1Bh> <4Bh> <00h><64h> <00h><50h> <0Ah> (800 * <FFh>)

dots offset 80 dots 80/8 data bytes length height (len * ht)/8

ASCII **ESC r**
Hex **1Bh + 72h + n**
Description **Sets print color (only in the two-color model)**
When this command is received, the ribbon color changes.
The color is determined by n:

n = 0 Black
n = 1 Red

ASCII **ESC i**
Hex **1Bh + 69h**
Description **Complete cut**
If the cutter is not disactivated, a complete paper cut is carried out. If the cutter is not connected, the disactivation flag is set and any subsequent paper cut commands will be ignored.

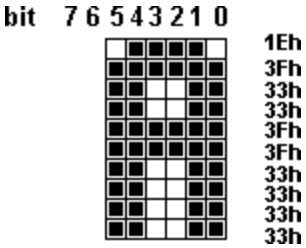
ASCII **ESC m**
Hex **1Bh + 6Dh**
Description **Partial cut**
If the cutter is not disactivated, a partial paper cut is carried out. If the cutter is not connected, the disactivation flag is set and any subsequent paper cut commands will be ignored.

ASCII **ESC &**
Hex **1Bh + 26h + n1 + n2 + ... n11**
Description **Defines a new character**
This command is used to change a font character and is useful for personalizing fonts. The modification is only temporary, and changes made to the character are cancelled when the printer is reset or the font is changed using the ESC+ t o ESC R commands.

n1 = value of the byte to be modified (32÷255)
n2÷n11 = 10 bytes that make up the 10 rows of the character

Example:
To change the letter “A” so that it has double-width lines and is taller

1Bh + 26h + 41h + 1Eh + 3Fh + 33h + 33h + 3Fh + 3Fh + 33h + 33h + 33h + 33h



ASCII **ESC W**
Hex **1Bh + 57h + n**
Description **Sets the number of columns**
This command selects the number of print columns. It must be changed at the beginning of a line since it is not possible to print a line in two different modes, and it also causes the line buffer to be cancelled. The number of columns is determined by <n>:

n = 035 columns
n = 142 columns

ASCII **ESC t**
Hex **1Bh + 74h + n**
Description **Selects the default font**
Selects the new font to be used which automatically becomes the default font. This means that following the next initialization, the font used will be the one that has just been selected. The font number must be chosen from among the available ones, and any request for n1 greater than the fonts available will be ignored. The font number is displayed during set-up.

ASCII **ESC C**
Hex **1Bh + 43h + n**
Description **Selects print direction**
This command selects print direction, i.e., in which direction the line is printed.

n1 == 0 normal printing
n1 <> 0 reverse printing

ASCII **ESC I**
Hex **1Bh + 6C + n**
Description **Setting cutter status**
This command selects cutter status, activating or disactivating it depending on the status of <n>. If disactivated, <Esc i> and <ESC m> are ignored.
If the cutter is activated but for some reason is inactive (breakdown, connector unplugged, etc.) the flag is reset. Cutter presence is tested during power-up and if it is not present, it is disactivated automatically.

n1 == 0 cutter disactivated
n1 <> 0 cutter activated

ASCII **ESC f**
Hex **1Bh + 66h + n**
Description **Status request**
This command requests a stamper status report.
The response byte is sent via the serial port without any control

bit 0 = PAPER
bit 1 = NOTCH
bit 2 = F-FEED
bit 3 = L-FEED
bit 4 = ERROR
bit 5 = CUTTER PRESENT
bit 6 =
bit 7 = MOTOR STATUS

ASCII **ESC A**
Hex **1Bh + 41h + n1 + n2**
Description **Moves the step motor**
This command moves the step motor in direction n1, n2 lines

n1 == 0	forward
n1 <> 0	backward
n2 =	number of steps

ASCII **ESC z**
Hex **1Bh + 7Ah + n**
Description **Sets the number of lines for Form Feed**
This command sets the maximum number of lines for the Form Feed.