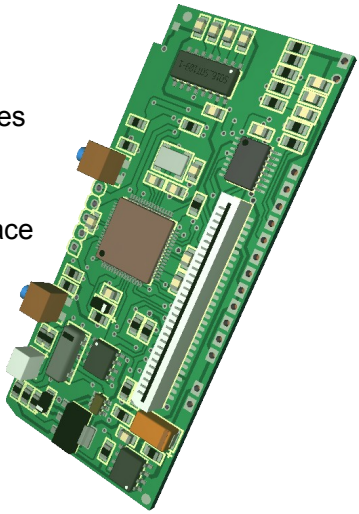
# MTH-2500, 2700 & 3500

**THERMAL PRINTERS WITH ELM-208 HEAD**



- Interface TTL serial RS232C RS422
  USB 2.0 Ethernet Parallel etc...
- Protocol: None or Modbus (RTU)
- Paper case Ø 31 mm or Ø 60 mm
- High definition and fast printing
- Bar codes and Graphic printing capabilities
- 24 and 42 characters per line
- 2 downloadable character sets
- Logo downloading and printing via interface or by closing a dry contact
- 5 VDC or 9 to 40 VDC supply voltage
- Setup by menu or interface
- Temperature control of the printing head
- Windows 10, 8.1, 8, 7, Vista, XP
- Selftest and hexadecimal dump



**Version 3.7 – english**

**PRELIMINARY NOTE**

Because of the evolution of standards and technologies and in a permanent concern for improvement, Andig reserves itself the right to modify the characteristics of the device described in this document without advanced notice.

# SUMMARY

# 1 General information

## 1.1 Printer operation

The basic idea for the conception of the MTH-2500 printer, was to push miniaturization as far as possible. The whole printer: case - head - interface holds in the volume of a big matchbox and consists of very robust elements. Small size also implies a small dimension for the paper roll, and also the change of paper was optimized to be extremely simple: you just need to open the upper lid, insert the paper roll and push the lid back to its initial position.
Could it be more simple?

MTH-3500 printer as the same basis with a greater paper case (Ø 60 mm). Thanks to this greater size, this printer can use labels rolls.

Numerous features are enclosed in the management software of the printer allowing for the printing of graphs and bar codes as well as numerous special effects.

**Bonus:**

- ✓ A 8K-bytes logo can be stored in the flash memory. The printing of this logo can be made through the printer interface or by closing a separate dry contact.
- ✓ Two character sets are embarked to allow you to vary your printed tickets.
- ✓ A very simple to implement graphic mode allows you to realize nice curves without complicated calculation.
- ✓ Windows 10, 8.1, 8, Seven, Vista, XP, 2K drivers are available and can be downloaded from our web site. This driver uses graphic compression tiff4 to increase the printing speed. It allows to select printing between paper or labels rolls. These drivers are unsigned , please disable the protection of drivers signed under the recent Windows to allow installation.

The printing speed and the silence of operation makes it the ideal instrument for point of sale terminals, ticket machines, cash registers and medical applications.
The 203 dpi density ( 8 points/mm ) authorizes the printing of graphs, curves and bar codes with excellent quality and resolution.

## 1.2 Material Description

The printer is designed around a Microchip PIC18F67J50 microprocessor, 128K-bytes of flash ROM and 3904 Bytes of RAM (2k-bytes are reserved for the receive buffer). An internal watchdog in the microprocessor is activated to insure an operation in strongly polluted industrial environment.

The printer can be connected in serial in TTL or RS232C levels, RS422 (without protocol or Modbus over serial), in USB 2.0, in Ethernet (Raw TCP/IP) ou (ModBus over TCP) or in parallel. Characters received by the interface are stored in its memory and interpreted by the micro-processor.

Different features such as line-feed and menu buttons, control LED, paper-end detector and rewinder are directly driven by the MTH-2500, MTH-2700 or MTH-3500 printers.

## 1.3 Part number

Several versions of the electronics are available. To completely define your product, it is necessary to add a suffix to the name of the printer to specify the selected computer connection

**MTH- $xx_1$ $x_2$ $x_3$ - $x_c$**

**Time Clock**
[C] : installed
[ ] : not installed

**Power Supply**
[1] : DC 5 V(P1)
[3] : from DC 9 to 40 V(P2)

**Interface**
[1] : TTL serial
[2] : RS232C serial
[4] : Parallel
[6] : USB
[7] : Ethernet (Printing TCP/IP)
[8] : RS422 (without protocol or Modbus over serial)
[9] : Ethernet (ModBus over TCP)

**Paper case & Enclosure**
[25] : standard for Ø 31 mm
[27] : standard for Ø 31 mm in DIN 96x96 case
[35] : Deep for Ø 60 mm

(P1) Logic VCC and Power VPP must be supplied in 5VDC. To use a unique supply, please consult our AN117 application note on our web site.
(P2) Power supply is unique and must be any value between DC 9 to 40 V.

## 1.4 TECHNICAL DATA

Character sets IBM-II
Text print speed 7 character lines / second
Character size (H x W) H= 3mm (24 dots) x
W= 2mm (16 dots) or 1,125mm (9 dots)

**Interfaces**

**Serial**

| | |
|---|---|
| **TTL** | Level : 0/5V |
| **RS232C/V24** | Level : ± 12V |
| Handshake : | XON/XOFF and RTS/CTS |
| **RS422** | Level : 0/5V |
| Protocols : | Without Protocol (Receive only) or Modbus over serial |
| **USB** | version 2.0 Printer class |
| **Parallel** | Handshake Busy Paper-End |
| **Ethernet** | |
| **Printing TCP/IP** | Lantronix Xport module |
| **Modbus over TCP** | Lantronix Xport-IAP module |

| | | | |
|---|---|---|---|
| **MTH-xxx1** | Power supply | DC 5 V | |
| | Consumption | Waiting mode | 90 mA |
| | | Black printing | ~3 A |
| **MTH-xxx3** | Power supply | from DC 9 to 40 V | |
| | Consumption | Waiting mode 50 mA (under DC 12V) | |
| | | Black printing ~1,5 A ( under DC 12V) | |

**for MTH-2xxx**

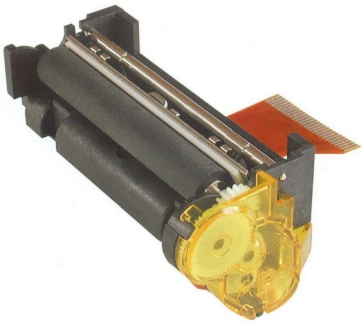
| | |
|---|---|
| Weight (without roll) | ~75 g |
| Size in mm | 77 x 77 x 40 ( W x D x H ) |
| Operating temperature | 0 to 50°C |
| Paper | MPA-TH-57-31-TL-SB |

**for MTH-3xxx**

| | |
|---|---|
| Weight (without roll) | ~105 g |
| Size in mm | 77 x 113 x 70 ( W x D x H ) |
| Operating temperature | 0 to 50°C |
| Paper | MPA-TH-57-50-1 |

## 1.5 Print Head Technical Data

| | ELM208-HS |
|---|---|
| Technology | Thermal |
| Power supply | Head 5,5-9,5 V / Logic 3-5,25 V |
| Paper width | 58 mm |
| Dots / line | 384 |
| Printing density | 203 dpi (8 points / mm) |
| Characters / line | 24 or 42 according to selected font |
| Distance between dots | 0,125 mm |
| Distance between lines | 0,125 mm (two motor steps ) |
| Head temperature sensor | Thermistor on the head |
| Paper-end sensor | Reflective optical sensor |
| Life | 100 x $10^6$ pulses, 50 kms |
| Dimensions in mm | 68 x 22 x 31 |
| Weight | ~ 40 g |

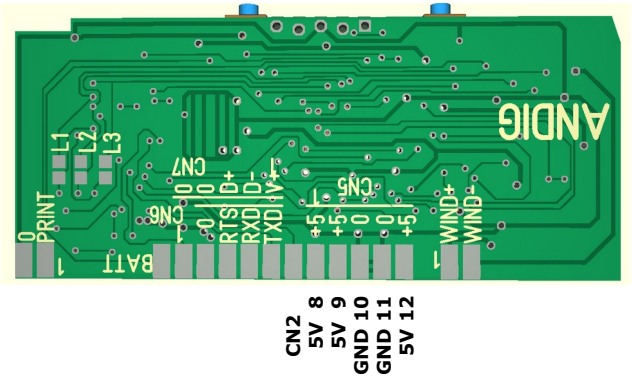


*ELM-208-HS*

# 2 Wiring Information

## 2.1 DC 5V Power Supply

Supply must be connected on CN2
(type Molex KK – 5 pins male connector at 2.54mm step)




| CN2 | Power supply |
|---|---|
| 8 | VPP (power) |
| 9 | VPP (power) |
| 10 | GND |
| 11 | GND |
| 12 | VCC (Logic) |

## 2.2 DC 9-40 V Power Supply

Basis board is only powered in DC 5V. To add DC 9-40 V Power supply, we install add-on cards directly fixed under the bottom of the printer case.

Power supply connector is similar on all the add-on cards. It is a 2 pins connector (Phoenix MCV105/12G at 3,81mm step). Corresponding "Power Supply" connector is delivered with the printer. It is a "Miniconnec MC 1,5/2-ST-3,81" and can be mounted without special tool.

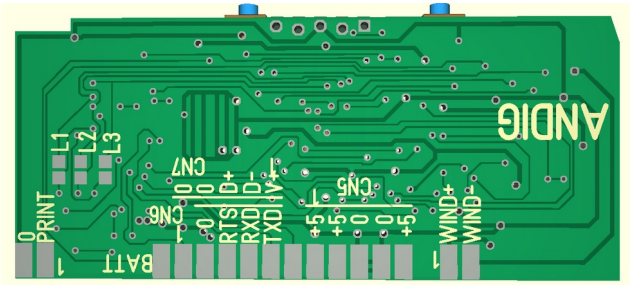

| Alimentation 9-40 VDC | |
|---|---|
| 1 | VPP (DC 9-40 V) |
| 2 | GND |

Depending of the versions, add-on cards can offer other fonctionnalities like parallel interface, Ethernet interface, RS485, Communication Class USB interface and battery support for the clock chip and so on...

## 2.3 SERIAL TTL AND RS232C

**TTL serial** connections in 0/5V levels must be connected
**on CN2 :** type Molex KK – 4 pins male at 2.54mm step
Available on MTH-2500 & 3500
Not available on MTH-2700

| CN2 | SERIAL | WAY |
|---|---|---|
| 3 | GND | - |
| 4 | RTS | Output |
| 5 | RXD | Input |
| 6 | TXD | Output |



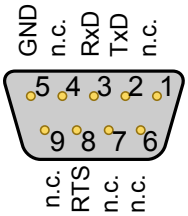

*For information: TTL serial is active if bridges L1, L2 and L3 are closed and U1 component : MAX-232 is absent.*


**RS232C serial** connections in ± 12V levels must be connected
**on CN2 :** type Molex KK – 4 pins male at 2.54mm step
for MTH-2500 & MTH-3500 without add-on card

**On Sub-D 9 pins female socket :**

- on the add-on card
  for MTH-2500 & 3500 with add-on card
- at the back of the DIN96x96 enclosure
  for MTH-2700

*For information: RS232C serial is active if bridges L1, L2 and L3 are opened and U1 component : MAX-232 is present.*




**HANDSHAKE**

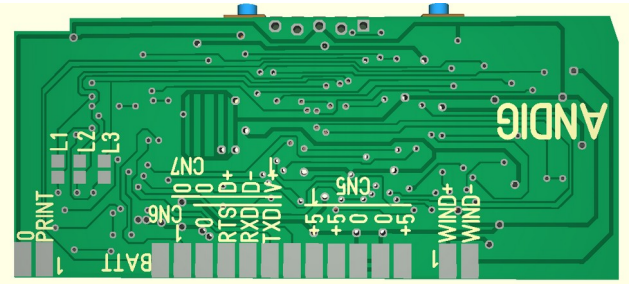
- <u>If printer is Busy:</u> a **XOFF** character (13h) is sent on the interface and line **RTS** goes **HIGH** (TTL:+3.3V / RS232:-12V)
- <u>When printer comes back Ready:</u> a **XON** character (11h) is sent on the interface and line **RTS** goes **LOW** (TTL: 0V / RS232:+12V)

**PAPER END MONITORING**

- If paper-end occurs, a PAPER-END character (19h) is sent.
- When a new paper roll is installed, a PAPER-OK character (17h) is sent.

## 2.4 USB

USB interface apply to the USB 2.0 specifications and answer to the Printer Class. USB interface is powered directly by the printer. It can be connected in CN2 (type Molex KK – 4 pins males at 2.54mm step)




| CN2 | USB |
|---|---|
| 2 | GND |
| 3 | GND |
| 4 | D+ |
| 5 | D- |
| 6 | VUSB |


Note:
VUSB input is not used to powered the printer but only to detect if the host computer is present.

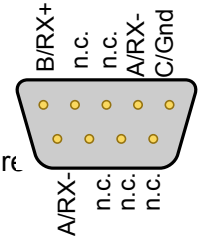
Except when ordering specific housing including its USB connectivity, the printer comes with a small USB cord with a female socket type A, length ~ 18cm .

## 2.5 RS422 Serial

Two modes are possible : **« Without protocol »** (only the data reception is possible) or in **« Modbus over serial »** ( voir § 5.6)

**On Sub-D 9 pins female socket :**

- on the add-on card for MTH-2500 & 3500
- at the back of the DIN96x96 enclosure for MTH-2700




Bridges 1-2 and 5-6 can be closed for polarise A and B lines.


Bridge 3-4 adds a 120 Ω terminator resistor.

## 2.6 Other Interfaces

Other interfaces are available on add-on cards. They are not described in this manual but in others specific manuals delivered with your product:

- Parallel interface on a Sub-D 25 pins socket
- Ethernet Raw TCP/IP interface
- Ethernet ModBus over TCP interface
- etc...

## 2.7 Backup Battery

Only for printer versions with incorporated clock, to preserve the clock settings, a DC 3 V battery must be connected to CN2 (type Molex KK – 2 pins at 2.54 step).
A battery holder and its battery can installed by our factory service on an additional card, depending on options chosen.

| CN2 | BATTERY | POLARITY |
|---|---|---|
| 1 | BAK + | + |
| 3 | BAK - | - |

## 2.8 Rewinder

The rewinder of the MP-200-60-62 serie allows the rolling-up of the printed paper for archiving. Their DC 5 V supply voltage is supplied by the printer. To connect on CN4 (type Molex KK – 2 pins at 2.54 step)

| CN4 | REBOBINEUR | |
|---|---|---|
| 1 | Rewinder + | (VCC) |
| 2 | Rewinder - | (Signal) |

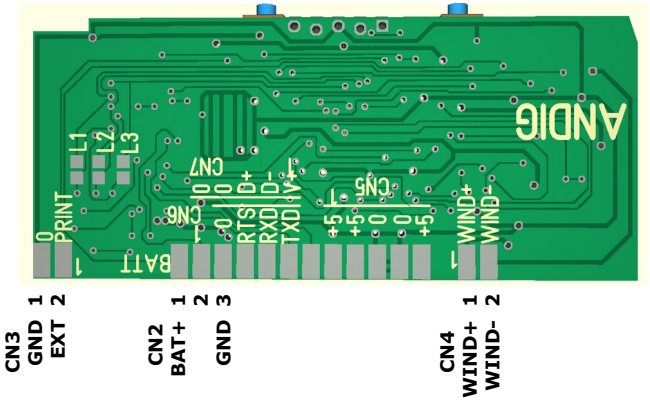
References: Rewinder
MP-210-60-62: without fastening stands
MP-220-60-62: with fastening stands

## 2.9 Ext Input

Ext input is available on CN3 (type Molex KK – 2 pins at 2.54 step).

| CN3 | Ext Input |
|---|---|
| 1 | GND |
| 2 | EXT |

**Advanced->Ext input** menu allows to choose the use of the Ext input on CN3 connector between Not Used, Print Logo, Analog Input (ADC) and Counting Input (CPT).



# 3 Printer Operation

## 3.1 Start-Up

1. Connect the power supply and connection cables
2. Turn power on

The interface will control its memory, set its parameters according to the data menu stored in its Flash memory, look for the possible presence of a clock circuit and moves the printing head 8 steps to synchronize the step motor. At the end of this initialization cycle, the printer is ready for receiving characters.

## 3.2 System Reinitialization (RESET)

The printer is designed with a watchdog which makes a reset at power-up authorizing the use of a slow ascent supply. About 300 milli-seconds after the controller is powered-up, this one is ready for operation, having ended its reset cycle.

## 3.3 Paper Loading

- Open the printer
- Remove the old paper roll
- Install the new paper roll
- Close the printer

## 3.4 Control Panel

The control panel allows the user to interact with the printer with two pushbuttons and a status light.

- Button ► is used to feed the paper, to do the self-test of the printer, to activate the hex dump mode (§ 3.5) and for the setup menu (§ 5.5).
- Button ■ is used for the setup menu (§ 5.5).
- The bicolour LED informs the user of any malfunctions. A continuous GREEN light indicates proper operation, a flashing RED light informs an anomaly whose description is detailed in the table in § 5.4.

## 3.5 Self Test or Hexadecimal Dump

If, after a reset, the linefeed button ► is maintained pushed, a special cycle is run. The printer starts by printing the 4 first lines of the self test then wait until the button ► is released.

Selftest :
Simply release the button ► without other actions, the printer goes into self-test cycle.

Printer parameters and character set ate printed. The selftest gives only a probability of correct operation of the printer; indeed, the selftest procedure does not use transmission, this one can only be tested in real mode.

Then connect interface and power supply. The printer is ready for use !

Here is an example of partial selftest→

```
MTH-2500
--------------------

 SOFTWARE: F211v2.0

 SN: 00000001
 HW: 023ºC 4.85V
 Bootloader: None
 Buffer :  2048 bytes

 Downloaded Area
```

```
Clock
 No Clock
Printer
 Font         : Std16x24
 Direction    : TEXTMODE
 Nat. Chars   : USA
 Width        : Width x1
 Height       : Height x1
 PageLength   : 066
 Tab Length   : 006
 FF Replace   : 000
 Label Use    : Disabled
 Label Hi     : 001
 Label Lo     : 152
 Label Gap    : 080
 Label Hole   : 000
Connection
 Baud         : 9600 Baud
 Databits     : 8 databits
 Parity       : None
 Xon          : XON Single
 Interface    : Serial/USB
Advanced
```

**Hexadecimal Dump:**
Depressed the button ■ before releasing the button ►, the printer will switch to hexadecimal dump mode. It will print the text "HEX DUMP:"

In this mode, the hexadecimal values of successive characters are printed in a first column and their ASCII shapes in a second column. **Warning:** the control codes are not interpreted any more. This mode is used for connection debugging. Each line begins by a characters counter (also in hexadecimal).

Dump Hexa Example

```
MTH-2500
--------------------

 SOFTWARE: F211v2.0

0000: 44 55 4d 50   DUMP
0004: 48 45 58 3a   HEX:
0008: 1b 4a 06 0e   .J..
000c: 41 4e 44 49   ANDI
0010: 47 20 46 72   G Fr
0014: 0d 6c 1b 40   .l.@
```

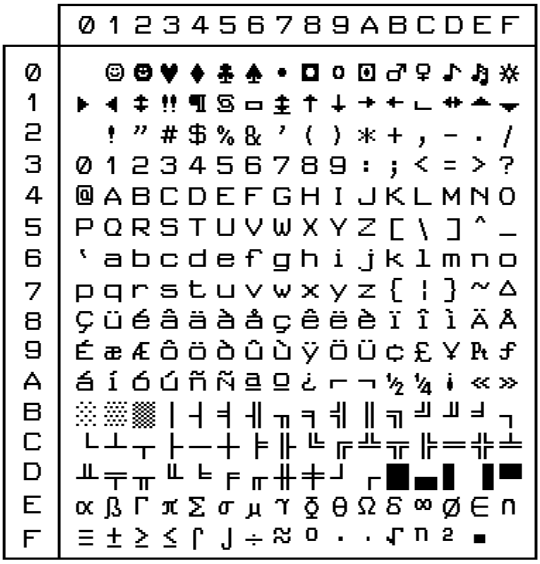
A hexadecimal dump is implemented in the printer. This mode can be activated for a long time by setting the setup menu : **Advanced->Compatible** on **HEXA**.

# 4 Characters & Commands

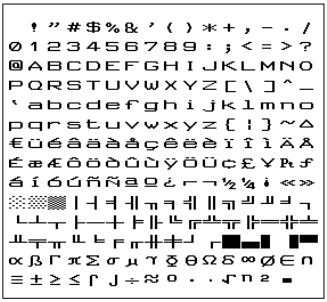
## 4.1 Character Set

Two complete sets of 255 IBM-II characters are available in ROM as well as national characters. Characters exist in 16x24 and 9x24 matrix allowing 24 and 42 characters by line with uppercase and lowercase letters.

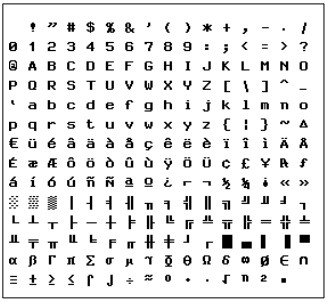
The selection of national characters is done by software or by the setup menu.



*Standard - Matrix16x24*



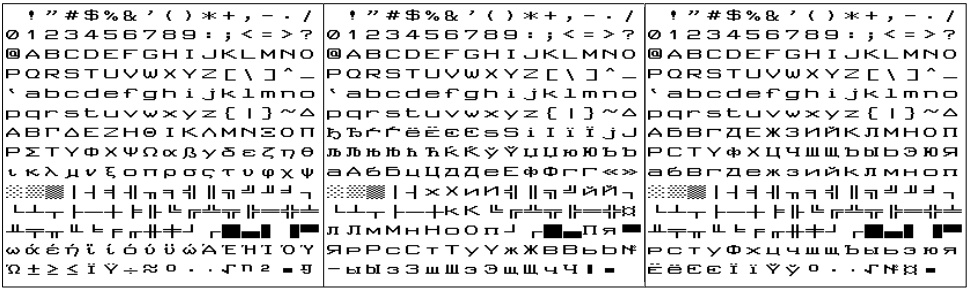
*Standard 16x24*



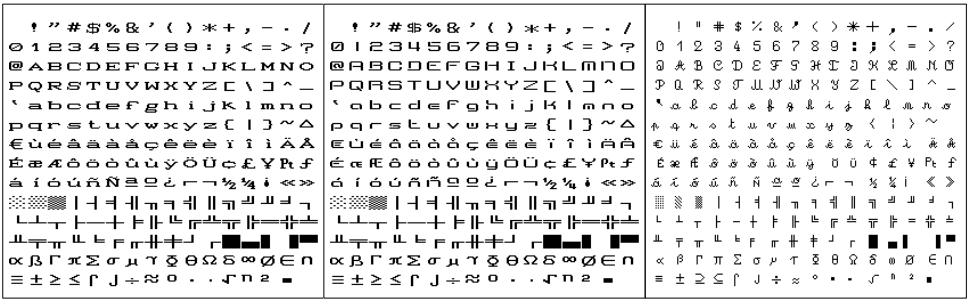
*Standard 9x24*

Other fonts can be uploaded in the printer to replace existing fonts. Every other fonts or sizes (maxi 16x24) are conceivable like Cyrillic, Greek, Kanji, etc...

Ask to our technical department for special fonts.



*CP737 - Greek* *CP855 – Eastern Europe* *CP866 - Russian*



*Times Font* *Modern Font* *Handy Font*

## 4.2 Printer Language or Compatibility

**MTH**: The default printer language is called MTH. It is near ESC/P commands essentially in text printing. In graphic, only one horizontal dot line is printed at once while ESC/P mode uses 8 or 24 vertical dot lines.

**PCL:** Last mode is PCL Raw. Only the graphic raw modes are interpreted with several compression types : No compression, Run Length, Tiff and Delta Row. A graphical scaling mode is implemented to fit large graphic printouts in the width of the printer.

**EPS24 Lite:** This mode is reserved to special applications.
It is not a full Epson 24 needles compatibility.

**Hexa:** In this mode, the hexadecimal values of successive characters are printed in a first column and their ASCII shapes in a second column. Warning: the control codes are not interpreted any more. This mode is used for connection debugging. Each line begins by a characters counter (also in hexadecimal). This mode can be temporary activated at the power-up (see chapter 3.5).

## 4.3 MTH Commands

The characters with their ASCII values between 01 hex and 1F hex are control characters and are printable only in transparent mode (see command ESC T n).

### 4.3.1 Character Set

| n | Font | Char/line |
|---|---|---|
| 0 | 0: Std_16x24 | 24 |
| 1 to 3 | 1: Std_09x24 | 42 |

- **ESC F n** (1B 46 Hex = 27 70 Dec)
  Select one of the 2 character fonts.
  Only the two lower bits of n allow to select the font. Equal to 0 for font 0; different for font 1.
- **ESC R n** (1B 52 Hex = 27 82 Dec)
  Select national characters.
  Default choice is selectable by the setup menu.

| n | NATION | 23 | 40 | 5B | 5C | 5D | 5E | 60 | 7B | 7C | 7D | 7E |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | U.S.A. | # | @ | [ | \ | ] | ^ | ` | { | \| | } | ~ |
| 1 | France | # | à | ° | ç | § | ^ | ` | é | ù | è | " |
| 2 | Germany | # | § | Ä | Ö | Ü | ^ | ` | ä | ö | ü | ß |
| 3 | Great-Britain | £ | @ | [ | \ | ] | ^ | ` | { | \| | } | ~ |
| 4 | Denmark 1 | # | @ | Æ | Ø | Å | ^ | ` | æ | ø | å | ~ |
| 5 | Sweden | # | É | Ä | Ö | Å | Ü | é | ä | ö | å | ü |
| 6 | Italy | # | @ | ° | \ | é | ^ | ù | à | ò | è | ì |
| 7 | Spain | Pt | @ | ¡ | Ñ | ¿ | ^ | ` | ˝ | ñ | } | ~ |
| 8 | Japan | # | @ | [ | ¥ | ] | ^ | ` | { | \| | } | ~ |
| 9 | Norway | # | É | Ä | Ö | Å | Ü | é | ä | ö | å | ü |
| 10 | Denmark 2 | # | É | Ä | Ö | Å | Ü | é | ä | ö | å | ü |
| 11 | Netherland | £ | @ | [ | IJ | ] | ^ | ` | { | ij | } | ~ |

- **ESC T n** (1B 54 Hex = 27 84 Dec)
  Print next character in transparent mode. Character n is not interpreted as control character but is directly printed. This command allow printing of characters with values smaller than 20 Hex (32 Dec).

### 4.3.2 Characters Enrichment

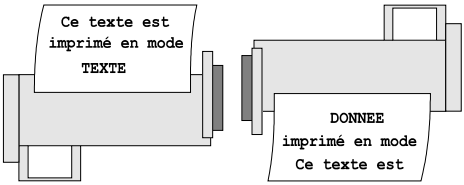
- **SO** (0E Hex = 14 Dec)
  Double width of characters
- **DC4** (14 Hex = 20 Dec)
  Simple width of characters
- **ESC - n** (1B 2D Hex = 27 45 Dec)
  Beginning / End of underline
  n = 1 (01 Hex) or '1' (31 Hex) Beginning of underline
  n = 0 (00 Hex) or '0' (30 Hex) End of underline
- **ESC W n** (1B 57 Hex = 27 87 Dec)
  Widening of the characters
  The default value of n is 0 (normal size).
  The maximum value depends on the actual font size and the margins :

| MATRIX | n MAX. | ENLARGEMENT |
|---|---|---|
| 16 x 24 | 23 | 24 times |
| 12 x 24 | 31 | 32 times |
| 9 x 24 | 41 | 42 times |

  If n is too big, widening is set to the maximal possible width.
- **ESC o n** (1B 6F Hex = 27 111 Dec)
  Graphic design of the zero
  n = 1 (01 Hex) or '1' (31 Hex) Slashed zero (default value).
  n = 0 (00 Hex) or '0' (30 Hex) Non slashed zero.
- **ESC w n** (1B 77 Hex = 27 119 Dec)
  Lengthening of the characters
  The default value of n is 0 (normal size).
  The maximum value of n is 9 (10 x the normal height)
- **ESC l n** (1B 6C Hex = 27 108 Dec)
  Setting the left margin in mm.
  The byte n represents the distance in millimeters from the left edge of the printing zone. This setting is independant from the text or data printing modes. Be careful, right and left margins only affect text printing, and do not affect graphic and bar code printing.

- **ESC r n** (1B 72 Hex = 27 114 Dec)
  Setting the right margin in mm.
  The byte n represents the distance in millimeters from the right edge of the printing zone. This setting is independant from the text or data printing modes. Be careful, right and left margins only affect text printing, and do not affect graphic and bar code printing
- **ESC { n** (1B 7B Hex = 27 123 Dec)
  Setting of the mode Text/Data
  n = 1 (01 Hex) ou '1' (31 Hex) Data mode
  n = 0 (00 Hex) ou '0' (30 Hex) Text mode (default setting)

  The text or data default mode is set-up by the setup menu




- **ESC I n** (1B 49 Hex = 27 73 Dec)
  Choice of printing contrast
  n < 128, printing becomes brighter
  n= 128, printing is normal
  n > 128, printing becomes darker

### 4.3.3 Horizontal Spaces

- **TAB** (09 Hex = 9 Dec)
  Tabulation
  Move the next printing position to the next tabulation.
- **ESC D $x_1$...$x_i$ NUL** (1B 44 ... 00 Hex = 27 68 ... 0 Dec)
  Tabulations setting.
  You can define as many tabulations positions xi than the number of characters that can be defined in the line of characters. This command must end with the NULL character (00 Hex).

  By default, tabulations are positioned every 6 characters in 6, 12, 18, etc...). This value can be changed by the setup menu.

### 4.3.4 Vertical Spaces

- **LF** (0A Hex = 10 Dec)
  Starting a new line.
  The LF (Line Feed) and CR (Carriage Return) characters act the same way by triggering the printing of the current line. Some word processing softwares use LF, others CR and a few others both commands to trigger a line printing. In order to avoid non required double interline spacing, in case a sequence including these two consecutive characters is received, only the first character received will trigger the printing, the other one will be ignored.
- **FF** (0C Hex = 12 Dec)
  In normal mode, starts a new page. See ESC C command.
  In label mode, moves the roll at the beginning of the next label.
  See GS P n command.
- **CR** (0D Hex = 13 Dec)
  Carriage return.
  Starting a new line. See LF command above.
- **ESC ) n** (1B 29 Hex = 27 41 Dec)
  Advancing for n character lines
- **ESC 2** (1B 32 Hex = 27 50 Dec)
  Return to the default space between the lines. (default value = 0)
- **ESC 3 n** (1B 33 Hex = 27 51 Dec)
  Setting the space between two character lines to n dot lines
  (n x 0.125 mm)
- **ESC 5 n** (1B 35 Hex = 27 53 Dec)
  No effect
  (only for compatibility with previous software versions)
- **ESC C n** (1B 43 Hex = 27 67 Dec)
  Setting the page length in lines of characters.
  The default value is set by the setup menu.
- **ESC J n** (1B 4A Hex = 27 74 Dec)
  Advancing for n dot lines (n x 0.125 mm).

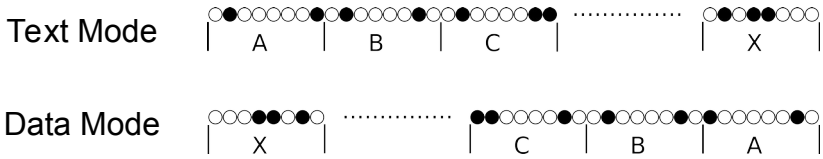
### 4.3.5 GRAPHICS

- **ESC f** (1B 66 Hex = 27 102 Dec)
  Printing a black line.

- **ESC K n $x_1$...$x_n$** (1B 4B ... Hex = 27 75 ... Dec)
  Line by line graphic printing.
  n represents the number of characters of the graphic string. The characters string $x_1$ to $x_n$ represents the desired printed pattern. All the bits of received characters are printed on the same line.

*Andig logo printed*

Not compressed example: ESC K <30h>ABC...X




Text and Data mode enrichment (ESC '{' n) and vertical lengthening mode (ESC 'w' n) only have an effect in graphic mode. In Text mode, the line is printed from left to right with the higher weight's bits to the far left. In Data mode, the line is printed from right to left with the higher weight's bits to the far right. Characters and graphics cannot be printed on the same line.

The graphic data transmission can be transmitted non-compressed or using tiff4 pack-bits compression mode (see ESC 'm' command).

- **ESC m n** (1B 6D ... Hex = 27 109 ... Dec)
  Setting of the graphic compression mode tiff4.
  n = 0 (00 Hex) or '0' (30 Hex) — No compression (default mode)
  n ≠ 0 (00 Hex) or '0' (30 Hex) — Tiff4 compression

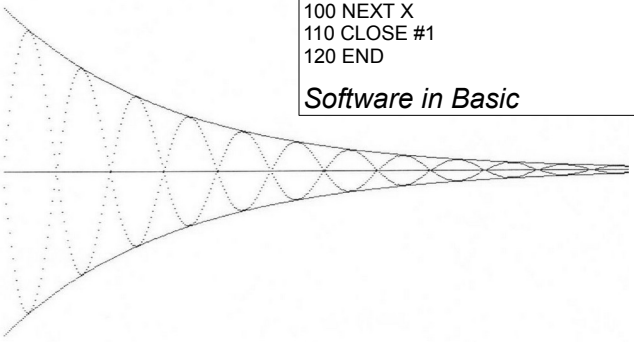
- **ESC ' $m_L$ $m_H$ $n_{L1}$ $n_{H1}$ .. $n_{Lm}$ $n_{Hm}$** (1B 27 Hex=27 39 Dec)
  Printing graphic curves.
  This command allows for easy printing of curves along the paper (vertically). The m value (transmitted on 2 bytes) represents the number of curves (points) to be printed for the current graphic line, and must be included between 1 and the maximum number of printable points per line (384).
  The $n_1$ .. $n_m$ values represent the position of these m curves (or points); the number of points ($n_1$ .. $n_m$) must be equal to m.
  Each point must be included between 1 and the maximum number of printable points per line (384), otherwise it will not be printed. As horizontal lines printing progresses, the vertical curves will show on the paper.
  The vertical lengthening (ESC 'w' n) act on the graphic curves.

**Example:** Basic software to print 4 curves and a central axis.

- $y = 192 + e^{-0,1x}$
- $y = 192 - e^{-0,1x}$
- $y = 192 - e^{-0,1x} * \sin(x/10)$
- $y = 192 + e^{-0,1x} * \sin(x/10)$
- $y = 192$

```
10 OPEN "COM1:9600, N, 8, 1, CS60000, DS, CD" AS #1
20 FOR X=0 TO 200
30 PRINT #1, CHR$(27); CHR$(39); CHR$(5); CHR$(0);
40 Y=INT(192*EXP(-.01*X)): YY=INT(Y*SIN(X/10))
50 PRINT #1, CHR$((192-YY) mod 256);CHR$((192-YY) div 256);
60 PRINT #1, CHR$((192-Y) mod 256);CHR$((192-Y) div 256);
70 PRINT #1, CHR$(192);CHR$(0);
80 PRINT #1, CHR$((192+Y) mod 256);CHR$((192+Y) div 256);
90 PRINT #1, CHR$((192+YY) mod 256);CHR$((192+YY) div 256);
100 NEXT X
110 CLOSE #1
120 END
```

*Software in Basic*



### 4.3.6 Logo

An 8K-bytes logo can be stored in the flash memory.
This logo can contain all of the characters and control sequences of the printer: enrichments, texts, graphics, graphic lines, bar codes, etc.... Only the backup, logo call, and reboot commands of the printers cannot be used.

Our software **"ProgMessage"** can help you to upload your own logo !

- **GS s $m_L$ $m_H$ $n_1$ .. $n_m$** (1D 73 Hex=29 115 Dec) ou
  ***ESC s $m_L$ $m_H$ $n_1$ .. $n_m$*** *(1B 73 Hex=27 115 Dec)*
  Storing the logo in the Flash memory.
  m (transmitted on 2 bytes) contains the number of bytes of the logo.
  $n_1$ .. $n_m$ are the n bytes constituting the logo
  The m value is $m_L$ + 256 x $m_H$ and must not exceed 8K-bytes - 2 bytes are reserved for the logo space!
- **ESC p** (1B 70 Hex=27 112 Dec)
  Printing the logo.
- Logo printing can be activated by closing to ground the Ext Input on CN3 connector if menu Advanced->Ext input is set to « Print Logo »

### 4.3.7 Labels Command

Label mode works when 'Label Use' setup menu is enabled and parameters : 'Label height', 'Hole Height' and 'Label Gap' are correctly set.

**See chapter Labels for more details (chapter 4.5).**

- **FF** (0C Hex = 12 Dec)
  In label mode, set the roll position at the start of the next label.
  See 'GS P n' command.
  In normal mode, Starts a new page. See ESC 'C' command.
- **GS P n (**1D 50 Hex = 29 80 Dec)
  Positioning labels command
  If n is even, this command feeds the roll at the start of the next label except if it is not yet on the start of a label.
  Same as FF in Label mode.
  if n is odd, this command feeds the roll at the start of the next label whatever its actual position.

### 4.3.8 Bar Code

- **ESC " 0 x1...xn** (1B 22 00 ... FF Hex = 27 34 0 ... 255 Dec)
  Printing the chain $x_1$ to $x_n$ as a bar code.
  This command must be ended by the FF Hex = 255 Dec character.
  Remark: If the chain contains a non authorized character or if the resulting bar code exceeds the paper width, the bar code drawing is replaced by a simple grey pattern and the erroneous character is replaced by a '?' in the HRI characters.

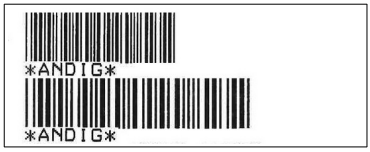

  **Example in CODE 39:** ESC " 0 MTH ANDIG
  so in hex: 1B 22 30 4D 54 48 20 41 4E 44 49 47 FF

- **ESC " 1 n** (1B 22 01 n Hex = 27 34 1 n Dec)
  Setting the bar code type

| n | Bar Code | Authorized characters | |
|---|---|---|---|
| 4 (04H) | CODE 39 | 0 to 9, A...Z, Space,$,%,*,+,-,/,. | by default |
| 5 (05H) | Interleaved 2 in 5 | 0 to 9 (even number of characters) | |
| 6 (06H) | CODABAR | 0 to 9, A,B,C,D,E,N,T,$,+,-,=,/,. | |

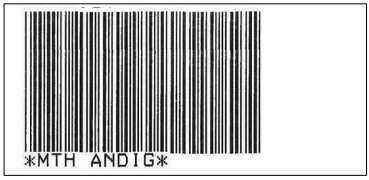
**Example: Setting CODE 39** ESC " 1 4
so in hex: 1B 22 31 34 or 1B 22 01 04

- **ESC " 2 n** (1B 22 02 n Hex = 27 34 2 n Dec)
  Enlargement factor of the bar code where n+1 represents the enlargement factor ( n between 0 and 3). The default value of n is 0.




  **Example:** Set Enlargement to 1 ESC " 2 1
  so in hex: 1B 22 32 31 or 1B 22 02 01

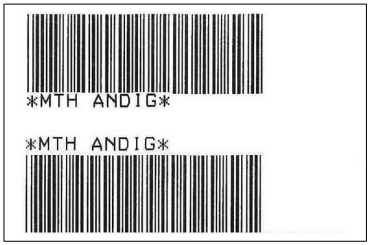
- **ESC " 3 n** (1B 22 03 n Hex = 27 34 3 n Dec
  Height of the bar code where n represents the number of dot lines of the bar code.
  The default value for the height is 48, therefore 48 * 0.25 mm = 12 mm.
  All the n values included between 1 and 255 are available.




  **Example:** Set height to 60 lines ESC " 3 <
  so in hex: 1B 22 33 3C or 1B 22 03 3C

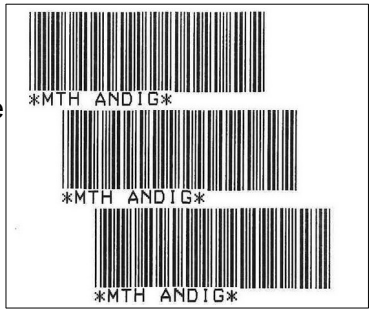
- **ESC " 4 n** (1B 22 04 n Hex = 27 34 4 n Dec)
  Printing Human Readable Information (HRI) on the bar code

| n | HRI |
|---|---|
| 0 | No printing |
| 1 | Printing after (default) |
| 2 | Printing before |
| 3 | Printing before and after |




Characters are printed with active enrichments (width, height), starting at the same left position than the bar code. The HRI characters going over the line are not printed.
Remark: only the 2 lowest significant bits are tested.
Example: HRI before ESC " 4 2
so in hex: 1B 22 34 32 or 1B 22 04 02

- **ESC " 5 n** (1B 22 05 n Hex = 27 34 5 n Dec)
  Bar code offset in millimeters.
  The n value by default is 0. Its maximum value is the number of millimeters of the printing area of the connected printing head minus 1.
  The position of the bar code is independant from the right and left margins.




**Example:** 7 mm offset ESC " 5 07h
so in hex: 1B 22 35 07 or 1B 22 05 07

### 4.3.9 Various commands

- **CAN** (18 Hex = 24 Hex)
  Cancelling the printing of previous characters.
- **ESC @** (1B 40 Hex = 27 64 Dec)
  Software reboot.
  All the settings are re-set to their default value.
- **GS v n** (1D 76 Hex = 29 118 Dec) ou
  ***ESC v n*** *(1B 76 Hex = 27 118 Dec)*
  Printer interrogation on serial interface.
  When receiving this sequence, the printer sends a parameter corresponding to the n value back on the serial interface.
  No effect in parallel or USB interface.

| n | Parameter |
|---|---|
| 0 | Printer name |
| 1 | Software and version |
| 2 | Manufacturer |
| 3 | Current date and time |
| 4 | Voltage |
| 5 | Head Temperature |
| 6 | Paper Sensor |
| 7 | Printer serial number |
| 8 | EXT0 value |

- **ESC = n** (1B 3D Hex = 27 61 Dec)
  Regrouping / Degrouping the strobes.
  n = 1 (01 Hex) or '1' (31 Hex)
  Regrouping the strobes
  n = 0 (00 Hex) or '0' (30 Hex) Degrouping the strobes
  Default value is set by the setup menu.
  **Degrouping the strobes:** to reduce the average power consumption of the printer, by default, the 6 strobes driving the printing head are successively driven one after the other. While printing text, the average power consumption is reduced to the detriment of the printing speed.

  **Grouping the strobes:** to increase the printing speed, several command strobes of the printing head can be grouped without exceeding the printers capability. Caution: the power consumption is then at the maximum level.

- **GS <FD> <zone> <Low> <High> <datas>** (1D FD Hex=29 253 Dec) ou
  ***ESC <FD> <zone> <Low> <High> <datas>*** *(1B FD Hex=27 253 Dec)*
  Flash memory area upload (Font, Logo, Parameters, etc...)
  (This command is reserved to the factory)

  **Warning:** reprogramming above can not be used without consultation of our technical services! May damage the printer !

### 4.3.10 SETUP COMMAND

- **GS ] $n_1$ $n_2$ $n_3$** (1D 5D Hex = 29 93 Dec) ou
  ***ESC ] $n_1$ $n_2$ $n_3$*** *(1B 5D Hex = 27 93 Dec)*

  Setup command followed by 3 bytes $n_1$ $n_2$ $n_3$.

  $n_1$ : - if $n_1$ = 0 (00 hex) or $n_1$ >=127 (7F hex)
  Backup setup in Flash memory.
  The two bytes n2 and n3 are not necessary.
  - between 1 (01 hex) and the number of groups
  Select the setup group

  $n_2$ : Select the setup field
  between 1 (01 hex) and the number of fields

  $n_3$ : Set the new value for the selected field.
  - if there are several choices:
  between 1 (01h) and the number of choices
  - if it is a number: a number in the authorized area

  See the menu summary table for the different choices of Groups, Fields and Values.

  **Warning:** The time setting is not allowed with this command !
  Use ESC 'c' command for the clock setting.

  For an easier setting, the setup information are sent by the printer on the serial line followed by a “carriage return” character (0D hex).

**Example:** GS ] 03h 01h 08h set, in the group **'Serial'**,
the Field **'Baud'** at the 8th choice: **'9600 Baud'**.
The printer send on the serial line:

**Serial ->Baud =9600 Baud**

GS ] 00h asks the backup in the Flash memory.
The printer send on the serial line:

**FLASH CONFIGURATION**

If a value is false, a specific error message is sent on the serial line by the printer:

**GROUP Out of range ! , FIELD Out of range !,**
**VALUE Out of range ! , NOTHING TO FLASH !,**
**Clock ->xxxxx = Not allowed !**

### 4.3.11 CLOCK OPTION

To obtain the printing of date and hour, it is possible to install a time clock, with a battery backup. The interface part number will contain the -C extension. For example: MTH2521-C. The time clock can be set over the computer interface, or thanks to the setup menu.

**Tip:** *Time can be sent back on the computer liaison with the GS 'v' 3*

- **ESC c 0 $x_1$... $x_{12}$** (1B 63 30 ... Hex = 27 99 48 ... Dec)
  Setting the real time clock.
  With x1... x12 ASCII code between 30 and 39 Hex (characters 0 to 9)
  At the reception of this command, the clock switches to the set-up mode and the twelve bytes x1... x12 represent the chain DDMMYYHHMMSS (Day, Month, Year, Hour, Minute and Second ).
  The clock can only be set-up at the beginning of a line.
- **ESC c 1** (1B 63 31 Hex = 27 99 49 Dec)
  Printing the date.
  At the reception of this command, the date is stored in the printing buffer at its current position.
  The format of the date depends on the selected characters set :
  MM-DD-YY : USA, Great-Britain, Japan (ex: 02-13-04)
  DD.MM.YY : Other characters sets (ex: 13.02.04)
  If the clock is not present or faulty, the printed date is 00-00-00.
- **ESC c 2** (1B 63 32 Hex = 27 99 50 Dec)
  Printing the time without the seconds.
  At the reception of this command, the time is stored in the printing buffer at its current position.
  The time format is HH:MM'.
  If the clock is not present or faulty, the printed time is 00:00'.
- **ESC c 3** (1B 63 33 Hex = 27 99 51 Dec)
  Printing the time with the seconds.
  At the reception of this command, the time is stored in the printing buffer at its current position.
  The time format is HH:MM'SS".
  If the clock is not present or faulty, the printed time is 00:00'00".

## 4.4 PCL Raw command

PCL Raw compatibility is implemented to allow connections on computers or terminals where installing new drivers is not possible and PCL is embedded.
Only the graphic functions are optimized in this mode.
Other PCL commands are ignored.
Graphical compressions Run Length, Tiff and Delta Row are supported.

| Mnenomics | Hexa | PCL commands implemented |
|---|---|---|
| ESC "&" | 1B 26 | |
| ESC "&" "a" # "H" | | Horizontal position |
| ESC "*" | 1B 2A | |
| ESC "*" "b" # "W" | | Graphic print |
| ESC "*" "b" # "M" | | Select graphic compression<br>(No compression, Run Length, Tiff, Delta Row) |
| ESC "*" "r" # "T" | | Set page length |
| ESC "*" "p" # "X" | | Set horizontal position |
| ESC "*" "p" # "Y" | | Set vertical position |
| ESC "E" | 1B 45 | Software reset |
| **PCL commands ignored :** ESC "!" ESC "#" ESC "$"<br>ESC "%" ESC "(" ESC ")" ESC "+" ESC "/" ESC "."<br>**Remarque:** Les autres commandes du mode Megatron qui n'ont pas d'équivalent PCL peuvent toujours être utilisées. | | |

A graphical scale mode is implemented in the printer.

- **For horizontal scale**, set "**Advanced**" -> "**Horz Scale**" menu.
  Scale factor is calculated on one byte, i.e. on 8 consecutive columns of the transmitted graphic.
  All the graphic line is analysed 8 columns at a time.
  **Example:**
  - to print 1 column on 2,
    set "Horz Scale" to "Scale 50%"
  - to print 1 column on 4,
    set "Horz Scale" to "Scale 25%".
- **For vertical scale**, set "**Advanced**" -> " **Vert Scale**" menu. It works like horizontal scale but on 8 consecutive lines of the transmitted graphic. Generally, it is used to keep the Ratio Horizontal/Vertical.
- **Limiting the number of blank lines in PCL.** The number of the setup menu **"Advanced" -> "PCL #Blank"** limits the amount of consecutive empty dotlines points to this value (0 to disable). The **"Advanced" -> "PCL #BlRep"** parameter is used to define whether the resumption of printing will take place on the next non-empty PCL line (**Multiple**) or on the next PCL page (**Single**).

## 4.5 LABELS

Label mode is available only with MTH-3500 printer because its paper roll diameter is bigger. It is enable by setting menu **Printer -> Label Use** on **Enabled**.

This mode change the printer operating :

- Paper-end optical sensor is used to detect the holes between the labels. The maximal hole height is 10 mm. A hole greater than 11 mm is interpreted as a Paper End.
- Depress on LF button feeds the label roll to the start of the next label.
- Form feed command (0Ch) feeds the label roll to the start of a label. Page length parameter is not used in this mode. Other commands are explained in chapter 4.3.7
- If no hole is detected during a too long length of paper, an error is sent to the user with the LED. May be, it is not a label roll but a paper roll or the paper-end optical sensor is defect.

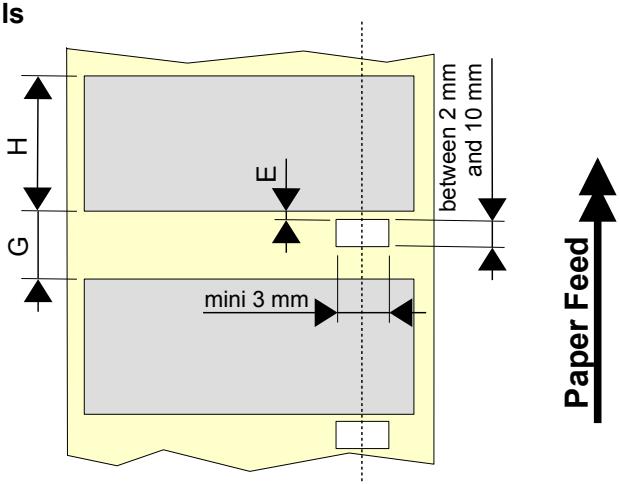
**Note**: The printer mechanism doesn't allow to use black marks, labels rolls must use holes between the labels. The begin of the hole is used to detect the start of a label.

Some parameters have to be set in the **Printer** menu to allow a good detection of the labels :

| | |
|---|---|
| **Label Use** : | Printer uses the label mode or not |
| **Label Gap** : | Inter-labels spaces, between 16 and 255 (mini recommended 64) |
| **Label Hi**: | High part of the Label height, between 0 and 3 |
| **Label Lo**: | Low part of the Label height, between 0 and 255 |
| **Label Hole**: | Spaces between the end of a label and the start of the hole, between 0 and 56 |

**Remember:** All distances are in dot lines, i.e.: distance in mm / 0.125.

**Labels rolls details**




**Holes:** The holes must be

- Centred at 13.5 mm of the right paper edge.
- Minimum 3 mm width
- Height between 2 and 10 mm. To recognize a paper-end of a hole, holes must have a height <11mm i.e.: <88 dot lines (88 x 0.125mm).
- Margin **E ('Label Hole')** between label end and the start of a hole can be set (between 0 and 56 dot lines, i.e. between 0 and 7 mm)

**Inter-Labels Spaces G or 'Label Gap':**

- Height between 2 and 31,8 mm. Suggested >= 8 mm.
- Feed back is not recommended. To immediately unglue the last printed label, we recommend a 8 mm minimum of inter-Labels spaces **G ('Label Gap')** even if the actual distance is smaller; but you lose some part of the top of the next label

**Labels:**

- Height **H** between 7 and 127.8 mm **('Label Hi' *256 + 'Label Lo')**
- Width 48 mm. If lower width, user must take care to not print out the the useful area.

**Roll:**

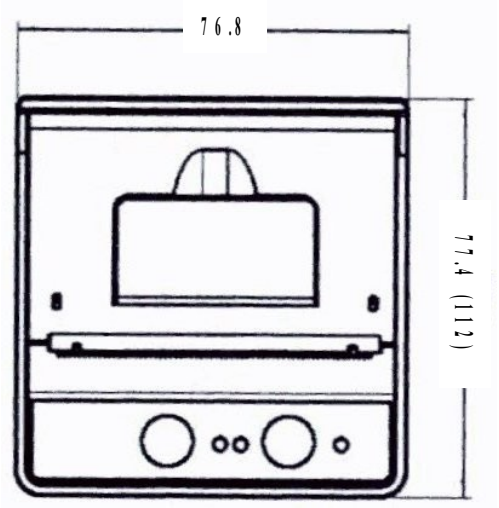
- Labels support width: 57 mm ± 0,5 mm
- External diameter maxi 60 mm (for MTH-3500)

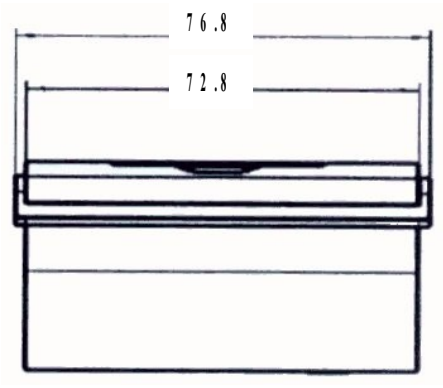
# 5 Appendix

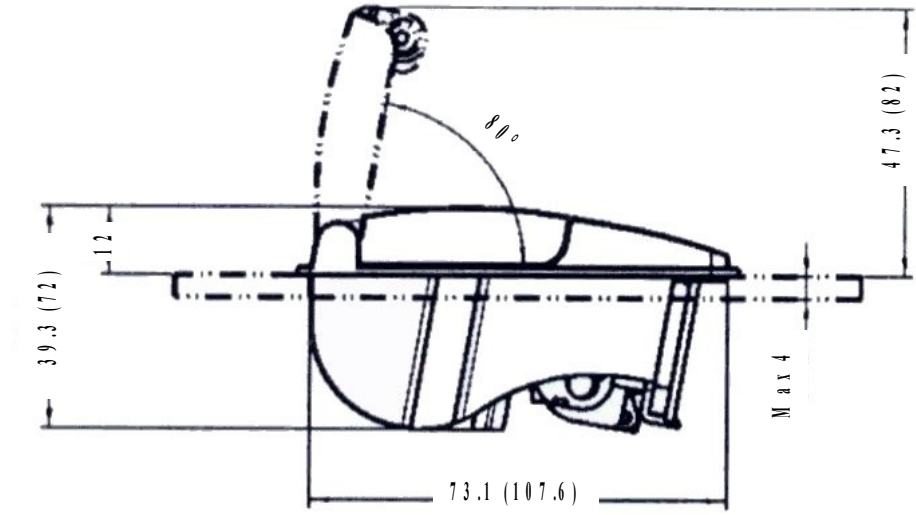
## 5.1 Dimensions and Cut-out

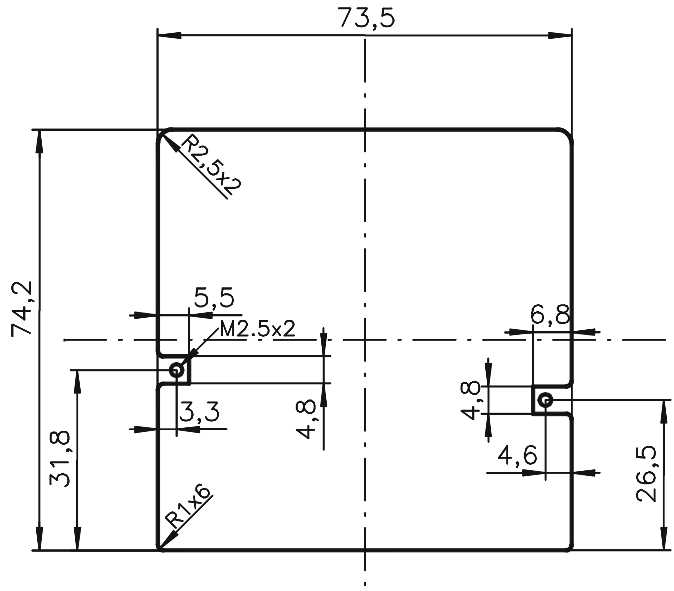
Sizes are given in mm. If there is only one value, it apply for the two cases MTH-2500 and MTH-3500. Otherwise

- the first value applies to the MTH-2500 case
- the second one (between brackets) applies to the MTH-3500 case

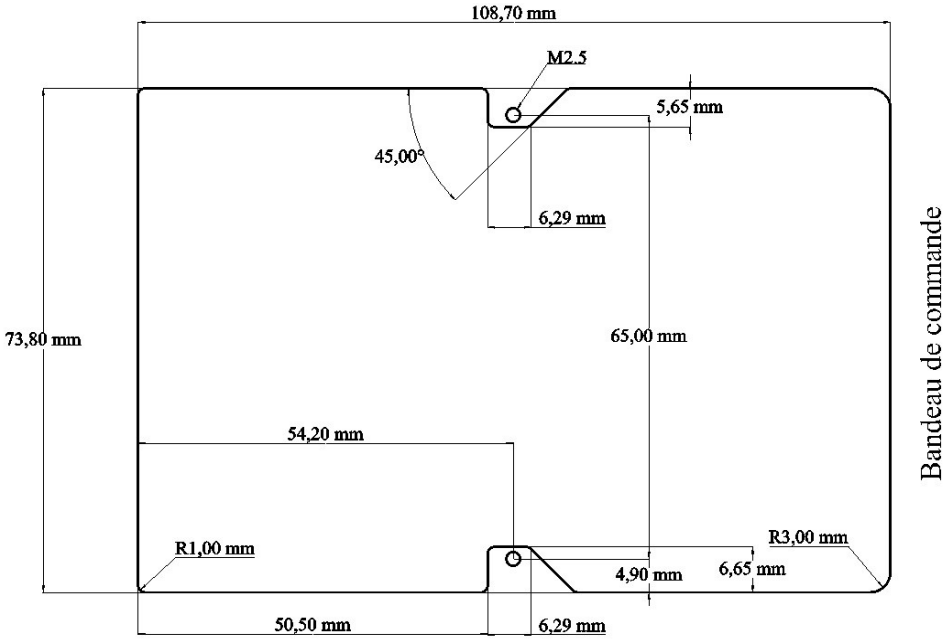





**CUT-OUT FOR MTH-2500**




**CUT-OUT FOR MTH-3500**

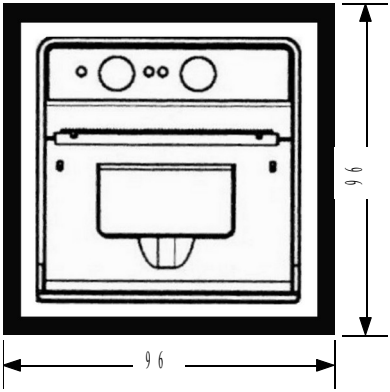
## 5.2 Cables and Papers

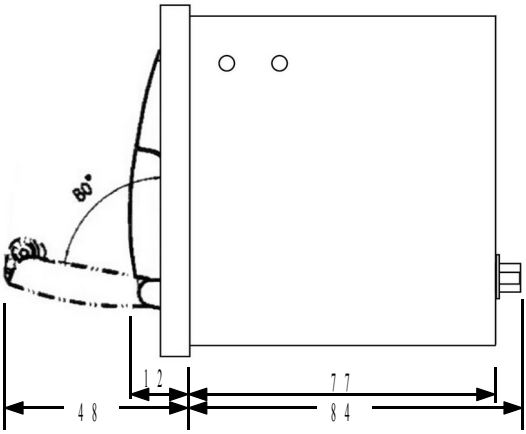
| Reference | Description | Printer |
|---|---|---|
| DKM-239-V | Serial RS232C/V24 cable<br>• 1x4 pins (step 2,54) / Sub-D9-F<br>• Length mini 1m50 | MTH-x52x |
| DKM-243-V | Serial RS232C/V24 cable<br>• Sub-D9-M / Sub-D9-F<br>• Length mini 1m80 | MTH-272x |
| DKM-247-P | Parallel cable<br>• HE10-2x13 pins / Sub-D25-M<br>• Length 2 m | MTH-x54x |
| DKM-256 | Serial cable (RS232C / TTL)<br>• 1x4 pins (step 2.54) / Free<br>• Length mini 1m50 | MTH-x51x<br>MTH-x52x |
| DKM-257 | Power supply cable<br>• 1x5 pins (step 2.54) / Free<br>• Longueur mini 1m00 | MTH-x511<br>MTH-x521 |
| MPA-TH-57-31-TL-SB | White thermal paper roll<br>• without Phenol<br>• Width 57 mm 0/-0.3<br>• External diameter 31 mm<br>• Length 11 m 0/+0.5 | All<br>MTH-2500 |
| MPA-TH-57-60-TL-SB | White thermal paper roll<br>• without Phenol<br>• Width 57 mm ± 0,5 mm<br>• External diameter 60 mm<br>• Length 43 m ± 10% | All<br>MTH-3500 |
| MPA-ETH-57-50-50-50 | White thermal labels roll<br>• Width 57 mm ± 0,5 mm<br>• External diameter 60 mm<br>• ~370 labels 50x50mm | All<br>MTH-3500 |

## 5.3 MTH-2500 IN SPECIAL CASES

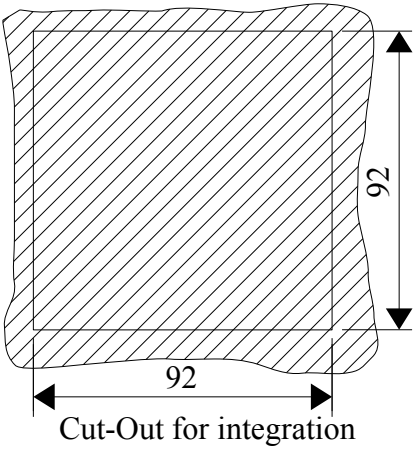
### 5.3.1 IN CASE DIN 96X96 : MTH-2700

MTH-2700 printer is a special version of the MTH-2500 integrated in a DIN 96 x 96 plastic case.








### POWER SUPPLY

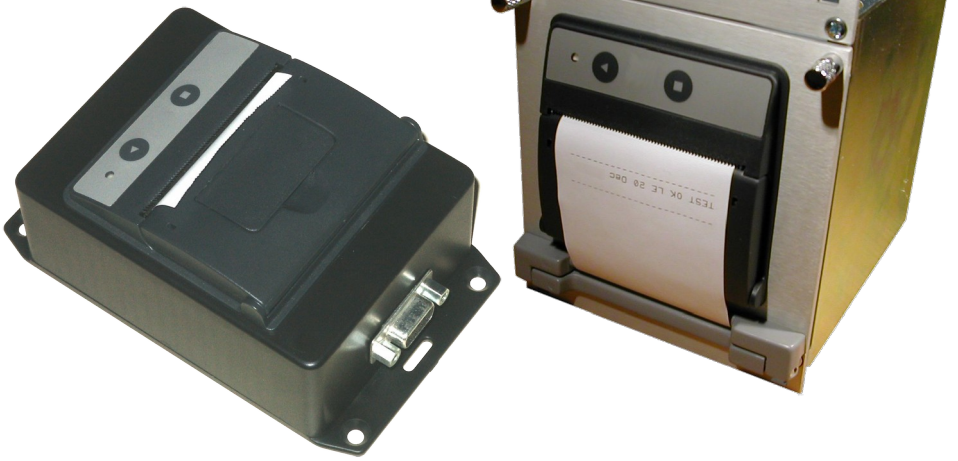
**Phoenix Contact Connector**
DFK-MSTB 2,5/2-G-5,08

Corresponding connector delivered :
type MSTB 2,5/2-ST-5,08

### 5.3.2 Other possible examples

Thes printers are easy to integrate in standard cases or in your machine panels.

Here is some integration examples !

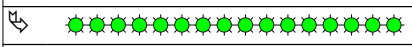
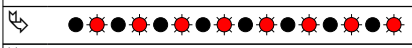
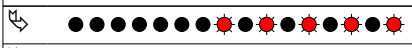
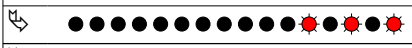
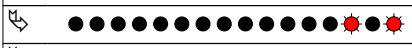
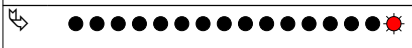
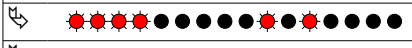
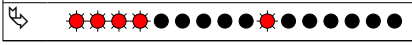


MTH-2500 IN WALL CASE

MTH-3500 IN DESKTOP PRINTER

## 5.4 Status LED

A status LED informs the user of the possible defects of operation.
A continuous lighting indicates a correct operation, a blinking red LED indicates an abnormal status which is explained in the table below:

| LED Cycle | Description |
|---|---|
|  | Correct operation (● or ●) |
|  | Paper End or Lid open |
|  | Label error |
|  | Menu activated |
|  | Abnormal temperature |
|  | Overflow in ram buffer<br>or RAM memory defect |
|  | Transmission error in Serial interface |
|  | Printhead unrecognized |

Time ~150 msecs LED Red : ● - Green : ● - shut-off LED : ●

Note: The printers will be gradually equipped with two-color LED: Green and Red.

## 5.5 Setup Menu

Two different ways are available for configuring the printer:

- by the interface (see command ESC "]")
- by this setup menu.

Simultaneously pressing the 2 Push-buttons ► (paper feed) and ■ (menu) activates the Setup Menu. The 'MENU ACTIVATED' message is then printed and the first group of setup items are printed too...

In order to modify the settings, you must navigate through the different groups(1), then the different items(2) and modify the value(3) of the items.

### (1)Navigate through the groups:

**Short push on**


: displays the next group


: displays the previous group

*Each group is printed after each short push on a button.*

**Long push on**


: enters in the different items(2) of the selected group


: saves the modifications and exits the setup mode. *Then the message **'MENU EXITED'** is printed out and a reset of the printer is then performed.*

### (2)Navigate through the items of a group:

**Short push on**


: displays the next item


: displays the previous item

*Each item and its associated value is printed after each short push on a button.*

**Long push on**


: enters the item value(3) selection mode for the selected item


: exits the navigation in the items and comes back in the group (1) navigation level

### (3)Modify the value of an item:

**Short push on**


: displays the next value


: displays the previous value

*The new selected value is only printed after a certain inactive time thus allowing multiple short presses without printing.*

**Long push on**


: validates the new selected parameter and prints this value in double width for control purpose.
*If the updated parameter was a clock item, the modification is immediately taken in account otherwise the setup menu has to be exited before the values are effective.*


: exits the navigation in the values and takes you back to the item(2) navigation level

## Menu summary table

| Groups | Fields | Items |
|---|---|---|
| Clock | Hours | 00 - 23 |
| | Minutes | 00 - 59 |
| | Days | 00 - 31 |
| | Months | 01 - 12 |
| Group 1 | Year | 00 - 99 |
| Printer | Font | Font1, Font2 |
| | Direction | TEXTMODE, DATAMODE |
| | Nat. Chars | USA, FRA, GER, ENG, DK1, SWE<br>ITA, SPA, JAP, NOR, DK2, NDL |
| | Width | Width x1, Width x2 |
| | Height | Height x1, Height x2 |
| | Page Length | from 1 to 255 lines |
| | Tab Length | from 1 to 16 characters |
| | FF Replace | Feed lines quantity to replace Formfeed, (0 inhibit) |
| | Label Use | Disabled, Enabled |
| | Label Hi | Label Height (High byte) From 0 to 3 |
| | Label Lo | Label Height (Low byte) From 0 to 255 |
| | Label Gap | Label Gap Height From 16 to 255 |
| Group 2 | Label Hole | Label Hole Height From 0 to 56 |
| Connection | Baud | 110, 150, 300, 600, 1200, 2400, 4800,<br>9600, 19k2, 28k8, 38k4, 57k6, 115k2 |
| | Databits | 7 databits, 8 databits |
| | Parity | No, Even, Odd parity |
| | Xon | Single Xon, Repeat Xon |
| Group 3 | Interface | Serial/USB, Parallel/USB |

| Groups | Fields | Items |
|---|---|---|
| Advanced | Compatible | MTH, HEXA, PCL Raw, EPS24 Lite |
| | Contrast | 0 (light) ... 128 (normal) ... 255 (dark) |
| | Winter/Sum | Enabled, Disabled |
| | No Paper | Standard, Set Busy |
| | Motor | Released, Hold |
| | Ext Input | Not used, Print Logo, ADC input, CPT input |
| | Strobes | Separated, Grouped |
| | Info Stamp | No Stamp, Add Date, Add Logo |
| | Horz Scale | Horizontal scale for PCL Raw, from 12% to 100% |
| | Vert Scale | Vertical scale for PCL Raw, from 12% to 100% |
| | PCL #Blank | Maximum quantity of empty lines in PCL, (0 inhibit) |
| Group 4 | PCL #BlRep | Options for PCL #Blank<br>Multiple: Print restart since a non-empty PCL line is received<br>Single: Print restart at the next PCL page |
| Modbus | ON/Slave | Disabled, Slave 01 to 29, Slave 252, Slave ANY |
| | Latency | AUTO 3.5c, Lat 2 msec, Lat 5 msec, Lat 10msec, |
| | | Lat 20msec, Lat 50msec, Lat 0.1sec, Lat 0.2sec |
| Group 5 | Word>Bytes | D=LOW-HIGH (direct), I=HIGH-LOW (inverted) |

**Parameters Explanation:**

- **Clock**: Clock setting mode.
  - Set manually the Hours, Minutes, Days, Months and Years.
    It can be easier to set the clock with the software command ESC “c”
    see § 4.3.11 !

- **Printer**: Change printing parameters
  - **Font**: Default character fonts (between the 2 proposed fonts)
  - **Direction**: Default choice of the orientation: text or data
  - **Nat. Chars.**: Select default national characters. This choice is not useful with 7 bits communication.
  - **Width** and **Height**: Select default character width and height.
  - **Page Length**: Set the page length in lines of characters. Works only with the Form feed command (0Ch)
  - **Tab Length**: Set the character numbers between two tabulations, between 1 and 16 characters.
  - **FF Replace** : When the Form Feed command is received (char 0Ch), replace the page feed set by **Page Length** by a pre-defined quantity of line feeds. When **FF Replace** = 0 , this mode is disabled.
  - **Label Use**: Enable/Disable the label mode.
  - **Label Hi**: Label height (High part), between 0 and 3
  - **Label Lo**: Label height (Low part), between 0 and 255 (FFh)

  The label height must be between 0 and 1023 dot lines i.e.: 127 mm.
  - **Label Gap**: Set the label intervals, between 16 and 255
  - **Label Hole**: Space between the end of the label and the hole, between 0 and 56. All labels values are in dot lines (i.e.: #mm/0.125)

- **Connection**: Change connection parameters
  - **Baud**: communication baud rate (only in serial),
  - **Databits**: number of data bits (only in serial),
  - **Parity**: Parity kind: Even, Odd or None (only in serial),
  - **Xon**: Number of XON sent in XON / XOFF protocol before reception of the first character (only in serial).
    Nota: Hardware handshaking (RTS/CTS) is always enabled
  - **Interface**: select the interface: “Serial/USB” and “Parallel/USB”

- **Advanced**: Change advanced parameters
  - **Compatible**: Interpretation of receiving data.
    - **MTH**: decodes sequences "escape" like ESC/P except in graphic mode
    - **HEXA**: Print all data in hexadecimal value (for debugging).
    - **PCL Raw**: decodes sequences PCL, especially in graphic mode
    - **EPS24 Lite**: Limited emulation of the EPSON 24 language. Reserved for special applications.
  - **Contrast**: this value allows to vary the contrast of the printing. Towards 0 (very clearly), 128 (normal), towards 255 (dark). Warning: the darker the printing, the more important the consumption of the printer is and the more the printing speed decreases.
  - **Winter/Sum**: Activation or not of the automatic change between winter and summer time
  - **No Paper**: User information in case of paper defect. **Standard** (the buffer continues to be filled and the user will be warned when the buffer is full); **Set Busy** (a paper defect blocks the connection immediately).
  - **Motor**: motor driving in waiting mode.
    - **Released**: Motor is stopped.
    - **Hold**: A current is maintained in the engine to avoid the paper to move. This mode consumes much more current and must be used only in case of very slow graphical printing.
  - **Ext Input**: Using the input CN3 between “Not Used”, “Logo Printing”, “ADC input”, “Counting input”. The last two choices are for our services and should not be used without our consent.
  - **Strobes**: Select if the printer strobes can be grouped or not. See command esc “=” for details
  - **Date Stamp**: Add information after each paragraph of texts
    - **No Stamp**: Nothing is added
    - **Add Date**: Add date and time
    - **Add Logo**: Automatically add the logo
  - **Horz Scale**: Horizontally scale in PCL graphic mode
  - **Vert Scale**: Vertically scale in PCL graphic mode

- **PCL #Blank**: Limitation of the number of continous blank graphic dotlines in PCL . As soon as the specified quantity of PCL empty lines is reached, the following lines are no longer printed.
  Resume printing is defined by the **PCL #BlRep** parameter..
- **PCL #BlRep**: This setting is an option of **PCL #Blank** parameter.
  **Multiple :** Printing resumes on receipt of a non-empty PCL line.
  **Multiple** empty areas are possible.
  Allows you to limit the amount of page space.
  **Single :** Printing resumes only on the next received PCL page.
  Only a **single** empty zone is possible.
  Very useful to eliminate a footer too long.

●**Modbus**: Modbus protocol parameters
- **ON/Slave:**
  **Disabled :** Modbus protocol not used
  **Slave 01…29,** Activation of the Modbus protocol &
  **Slave 252,** Selection of the slave address from 1 to 29 or 252
  **Slave ANY :** ANY: accept any slave address
  This choice is only for "Modbus over TCP"
- **Latency :** Waiting latency between 2 Modbus frames
  **AUTO 3.5c :** Duration of the transmission of 3.5 characters
  **Lat #### :** Duration indicated by the value after the word « Lat »
- **Word>Bytes :** Insertion order of the 2 bytes of each word in the reception buffer : D=Direct, I=Inverted

## 5.6 Modbus

The printers MTH-2500, 2700 et 3500 manage the Modbus protocol in RTU mode RTU (ASCII mode is not implemented).

Modbus protocol can be used with the interfaces :

[8] : RS422 (Modbus over Serial)
[9] : Ethernet (Modbus over TCP) with a Lantronix Xport-IAP module.

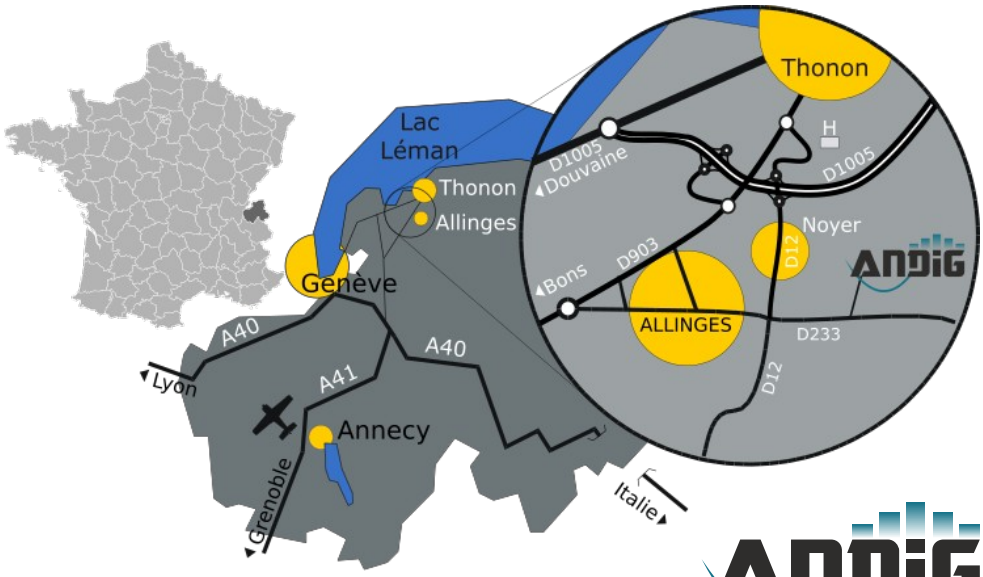
For all others interfaces, value Modbus → ON/Slave has to be « Disabled »

**For more explainations, please refer to the Application Notes :**

**AN157** for Modbus over TCP
**AN164** for Modbus over Serial

## 5.7 Documentation revisions

| Documentation | Firmware |
|---|---|
| doc_mth2500_2305_e37 | F211 v1.90 or more |
| doc_mth2500_1912_e36 | F211 v1.90 or more |
| doc_mth2500_1909_e35 | F211 v1.70 & v1.80 |
| doc_mth2500_1806_e34 | F211 v1.60 |
| doc_mth2500_1701_e33 | F211 v1.60 |
| doc_mth2500_1612_e32 | F211 v1.60 |
| doc_mth2500_1512_e31 | F211 v1.50 |
| doc_mth2500_1402_e303 | F211 v1.01 to v1.27 |
| doc_mth2500_1103_e301 | F211 v0.8 to v1.0 |
| doc_mth2500_1101_e30 | F211 v0.7 or less |
| doc_mth2500_1008_e22 | F168 & F191 |

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