

Multi4 V3

User Guide



MT4V3 software release: 3.0 or greater

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TECHNOMARK wishes to thank you for purchasing TECHNOMARK equipment. You have chosen the first flexible and intelligent **iD!**MULTI4 marking tool to mark and identify your products.

More than a marking machine, we provide a complete solution that will allow you to fulfil all your traceability needs.

Our customer service is at available for all additional inquiries.

And now, enjoy marking.....

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1. INTRODUCTION

Technomark maintains the right to modify information or specifications contained in this manual without prior warning. You must contact the Technomark Company to know about any changes that may have been implemented.

Under no circumstances may Technomark be liable for any incident, direct or indirect, concerning damages, however exceptional, including but not exclusively financial losses linked to the use of information included in this manual.

This clause applies as well in the case where Technomark would have been informed, and/or would have known before hand of possible risks, associated with the use of the equipment.

Technomark guarantees the equipment made by the company, as defined in the general sales conditions. Unless otherwise specified on our order receipt, our equipment is guaranteed 1 (ONE) year from the date of delivery.

This guarantee consists in us replacing free of charge the parts identified as defective, except for sub-assemblies supplied by third parties: in that case the supplier's guarantee applies.



This guarantee does not apply if the failure results from normal wear of the products, abnormal use, incorrect maintenance, not following the instructions or the state of art, unsuitable storage conditions, inappropriate environment, excessive usage of the equipment or disrespect of the user's manual instructions and/or electrical connections.

None of the repairs made under guarantee leading to a period of non-use, can allow a prolongation of the guarantee period.

All information included in this manual are confidential and remain the property of Technomark.

A. Safety instructions

Important safety information can be found throughout this manual. They are identified by the following icons:

-  : Indicates essential information related to users safety.
-  : Indicates information essential to avoid serious damage to the equipment.
- **NOTE:** Indicates complementary information.

Your Technomark Multi4 marking machine has been designed and manufactured to allow use in industrial applications. Nevertheless a few simple precautions must be followed to allow an easy use and an optimised life to your marking equipment.

B. PLEASE READ THESE INSTRUCTIONS CAREFULLY BEFORE USING YOUR MARKING EQUIPMENT



The Technomark marking machine must be used only by persons trained and qualified in its use.

Technomark marking equipment is using high voltage power. Therefore it can be dangerous to work with or around marking machines. The following safety instructions must be followed at all time:

- Switch off and disconnect power supplies when doing any maintenance work on the machine. OSHA standard recommend that all energy source must be stopped or disconnected and that all switches must be locked or tagged during a cleaning or maintenance operation. Make sure the equipment is installed following OSHA standards
- Keep away from all moving parts when the machine is in operation

Your marking equipment should not be exposed to direct water spray and should never be used outdoors in rain when it is connected to the mains



1. NEVER CONNECT/DISCONNECT THE MARKING HEAD IF THE CONTROL PANEL IS UNDER POWER (Mainly during a marking operation)
An incorrect connection can seriously damage or destroy the electronic components of the machine and cancel the guarantee.
2. NEVER SCREW/UNSCREW THE HAND NUT OF THE PIN ASSEMBLY USING A PLIER OR A TOOL.
Hand tight is enough.
Using a tool could seriously damage the electronic part of the machine. This will void the machine guarantee.
3. YOUR EQUIPMENT HAS BEEN DESIGNED TO BE USED IN VARIOUS SITUATIONS;
WHATEVER THE USE OF THE EQUIPMENT, AVOID ANY VIOLENT OR STRONG SHOCK ON ANY OF THE TWO COMPONENTS OF YOUR EQUIPMENT. AVOID SHOCKS ON THE FRONT PANEL OF YOUR CONTROL BOX.
You could damage the keys or the screen.
4. KEEP YOUR EQUIPMENT AWAY FROM ANY SOURCE OF INTERFERENCE (For example: welding machine, high frequency generator,...)
5. NEVER TRY TO MARK EMPTY (WITHOUT A PART TO BE MARKED UNDER THE MARKING HEAD)
The distance between the stylus and the part to be marked should never exceed 9,5 mm when marking. To do so could destroy your stylus (see graph page 17)
6. WHEN IN BATTERY USE, IT IS ESSENTIAL TO DISCHARGE FULLY THE BATTERY AT LEAST TWICE A MONTH. To do so will avoid a fast decay of the battery performances (NimH type)
7. The head cable's minimum bending radius must be maintained at $R = 125\text{mm}$ (5 inch) when it is static, $R = 200\text{mm}$ (8 inch) when it is mobile



8. When using the machine hand held, NEVER POINT OR APPLY THE ACTIVE PART OF THE STYLUS TOWARD YOURSELF OR A THIRD PERSON.
9. IT IS STRONGLY RECOMMENDED TO WEAR PROTECTIVE GLASSES DURING THE MARKING CYCLE. Small parts coming from the surface being marked could hurt.
10. WHEN USING THE MACHINE ON STAND, WE RECOMMEND TO INSTALL A RUBBER CARPET BETWEEN THE SUPPORT AND THE WORKBENCH. The principle of the machine use a succession of impacts, and this will limit vibrations and noise. It is as well recommended to install the machine on a heavy support to reduce noise and vibrations
11. NEVER PUT YOUR HANDS UNDER THE MACHINE DURING A MARKING OPERATION, you could get severe cuts and/or get caught between the stylus and the part to be marked.



Warning, hazardous moving parts, keep fingers and others body parts away.

12. DEPENDING ON THE PART TO BE MARKED AND THE CHOSEN DOT DEPTH, THE ACOUSTIC PRESSURE OF THE MARKING MACHINE MAY BE GREATER THAN 70 dB (A). Use ear protection during the marking process.

13. DO NOT TWIST THE CABLE OF THE MARKING HEAD.



14. DO NOT PULL OR LIFT THE MARKING HEAD BY THE CABLE.



2. Installing and starting

A. Installation

Installing your Multi4 Technomark marking machine is simple. The work bench arrives in two parts; the column is fixed on the base.

Please install your marking machine in a stable place with enough clear room to position in good conditions the base/column, the marking head and the control box.

Please follow the instructions here under to install properly your marking equipment:

- Install the control box in an aerated area, where the temperature will be between 0° and 45°C. In case of use of a battery, the temperature will be between 0° and 40°C.
- Connect the marking cable head in the corresponding control box connector
- Connect the power cable into the corresponding plug, on the control box

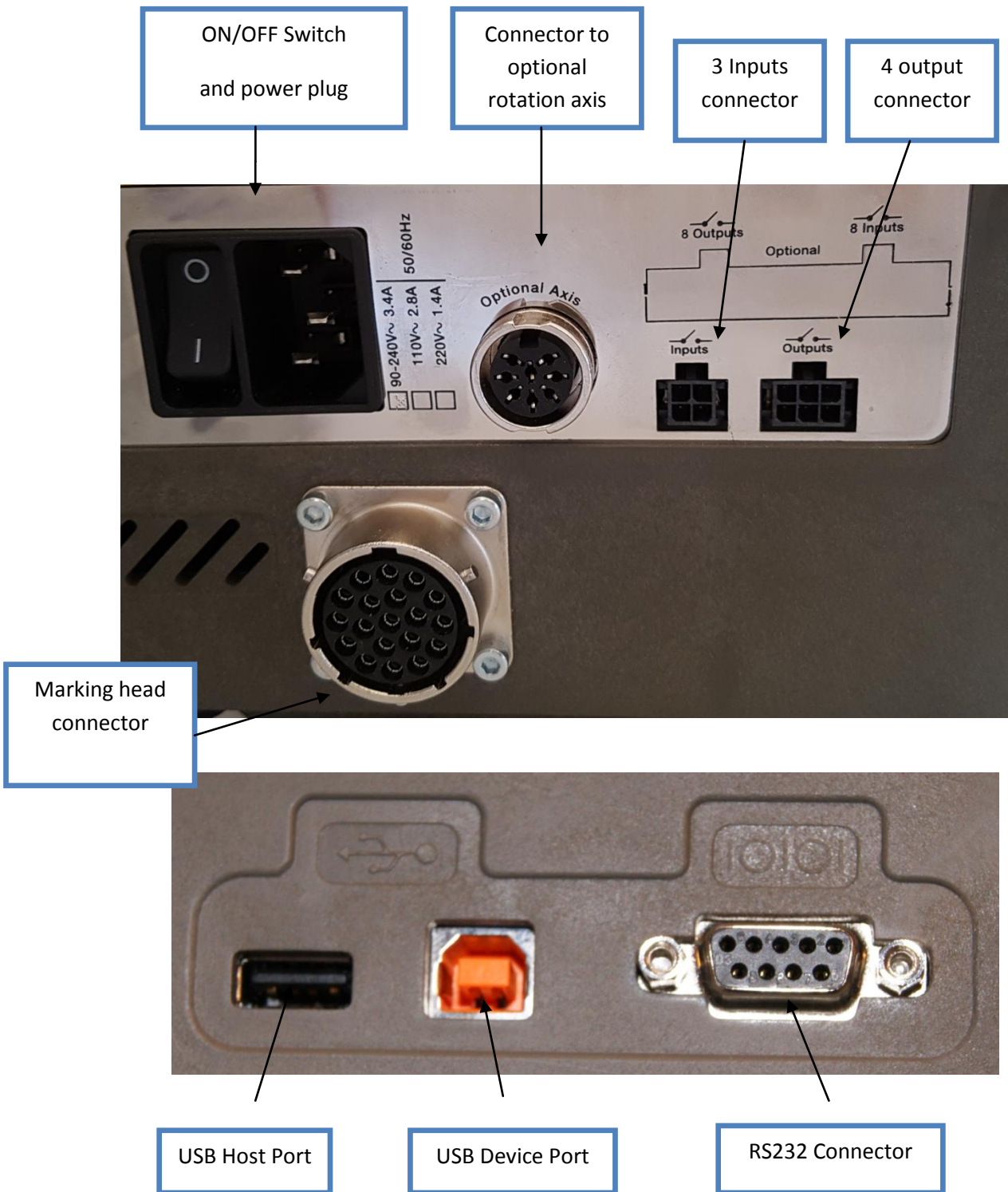


The socket outlet shall be installed near the equipment and shall be easily accessible.

The power cable shall be compliant to the standards of the country in which the machine is used.

The power supply of the machine has to be grounded. The ground connection must be made in accordance with the legislation in force to ensure the safety of the personnel.

Connectors are located on each side of the controller:



External circuits to be connected to the product shall be SELV type, as stated by the standards IEC60950-1:2005 and EN60950-1:2006/+A11.

B. Normal condition of use

- Power supply : 90-240 V~ 3.4A 50/60 Hz
- Temperature : 0 – 45 °C (0 – 40°C with battery)
- Relative Humidity : 0 – 90%
- Electro-magnetic compatibility (C.E.M):
EN55022 (2006 +A1/2007)
EN55024 (1998 + A1/2001 + A2/2003)
EN 61000-6-2 (2005)

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense. Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.



This product belongs to Class A. In a domestic environment, this equipment could emit radio interferences and in that case, the user may have to take appropriate actions to eliminate those interferences.

Your Multi4 marking machine is declared to be conforming without any reserve and the certified trial reports are available on request.



In case of intensive use, the active part of the machine (marking solenoid) can reach the temperature of 70°C. Do not handle this element without an adapted protection and/or let it cool down before any intervention.

C. Starting your marking equipment:

Your Multi4 marking equipment requires a 90 to 240 V power supply.

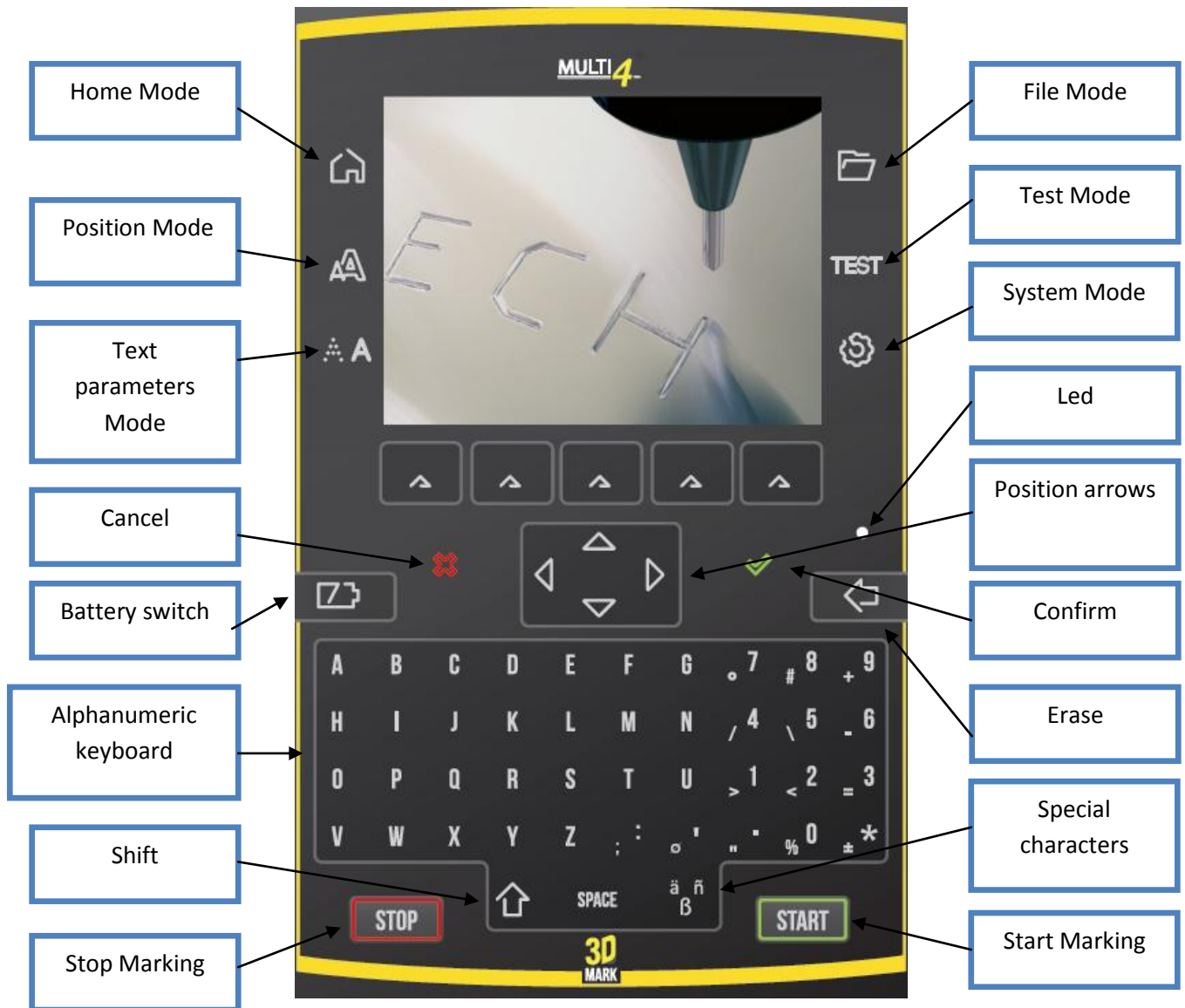
To turn on your marking equipment, action the ON/OFF switch

The system will start and the marking head will initialise itself, moving to its origin reference.



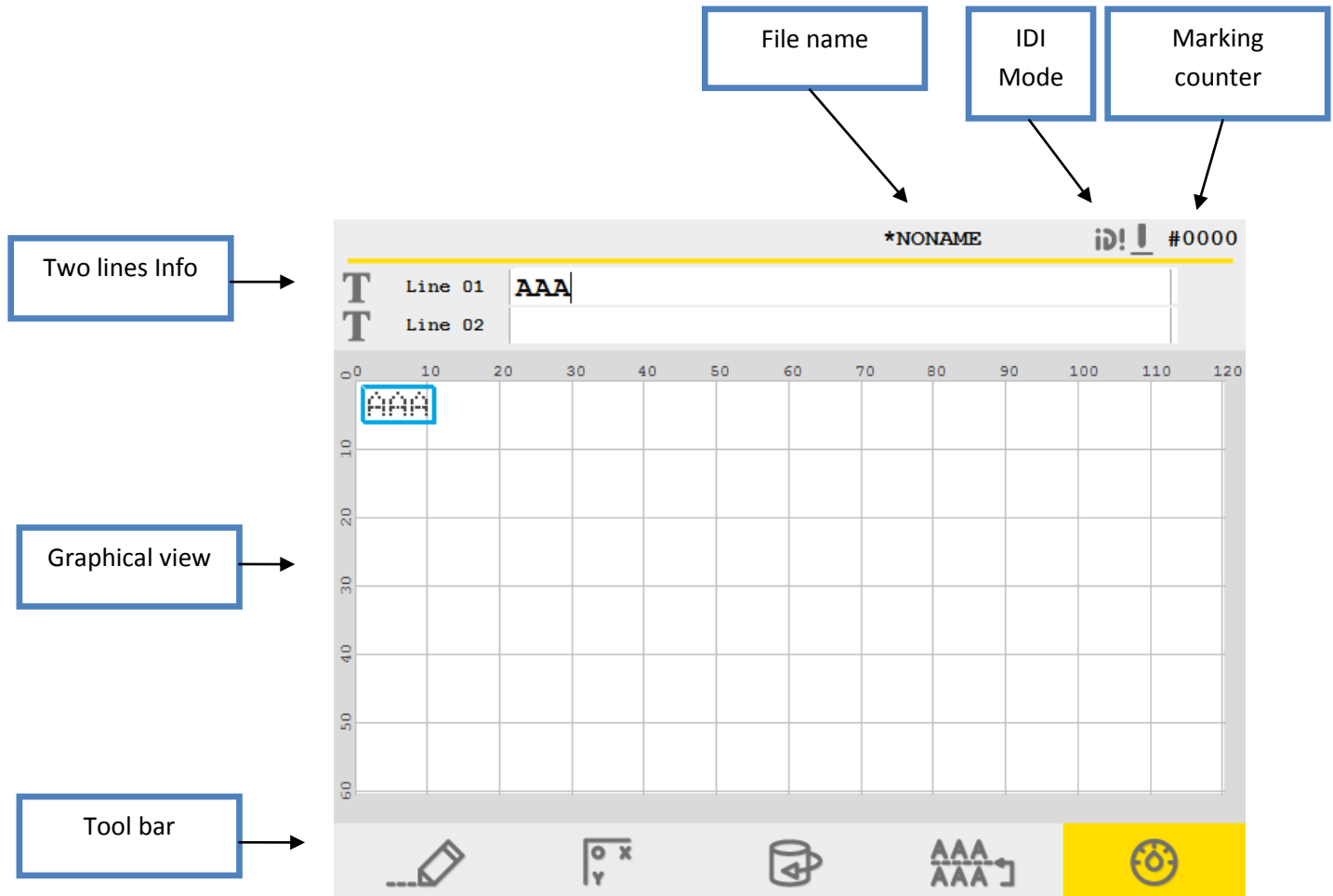
Please make sure that the stylus will **not encounter any obstacle during its position.**

D. Front Panel



3. Main screen and general operation

Once the machine is started, the screen (if no error has been detected at the power up) looks this way:



The *file name* shown is the one of the **current file**.

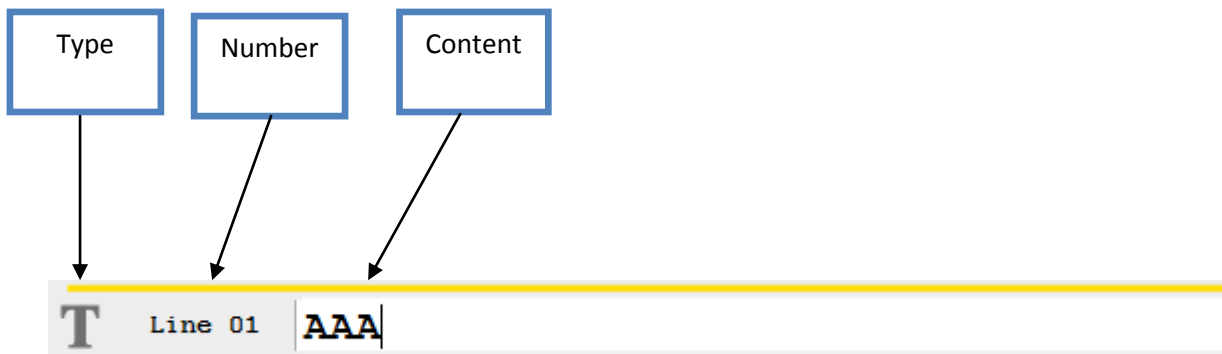
If a file is in a sub folder, his name is on the left of the file name (see [Folder](#)).



If the file has been modified but not saved a small star* is added at the end of the name, to warn the user. Once the modifications have been saved (see [save](#) or [automatic save](#)), the star disappears.

The marks counter is incrementing at the end of each mark realised. It can be re-initialized (see [interface parameters](#))

The line information is as follow:




- Type: the type of the line. Depending on the function of the line, this can be:
 - [Text](#)
 - [Timestamp](#)
 - [Serial number](#)
 - [Logo](#)
 - [Datamatrix](#)
 - [Rotation](#)
 - [Crossing point](#)
 - [Variable code bar](#)
 - [Pause](#)
 - [Z sensor or Z electric ascent](#)
- Number: the number of the line. The lines are numbered and arranged in a growing order.
- Content : What is in the line ; it will depend on the type of line

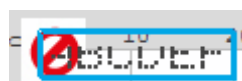
The *position* arrows up and down on the front panel allows **to select a line** (it will become the current line) and to scroll the lines on the screen in the *line information* zone

In the graphic view, the current line is highlighted in grey and framed by a blue line:





The graphic view is the image on the screen of the marking which will be made. It is completed with a square grid, allowing easy positioning. The grid units can be set in mm or inches (see [system parameters](#))


The graphic view shows the points outside the marking windows with a “forbidden” icon: 




The tool bar displays different function, depending on the mode selected, reachable thru keys at the right and left of the screen.

Most of the modifications made by the user need to be confirmed with the *confirm* key: 

The *cancel* key:  cancel the modification and allows coming back to **home mode**

To start [marking](#), press on the start button .

A single click on the stop button  force the marking process into pause. A second click cancels the marking and the machine comes back to its origin.

There are two types of users for the marking machine:

A *production* user with **limited rights** and a *supervisor* user who can accede to the full functionality of the machine.

The tool bar shown to the production user is reduced to basic functions.

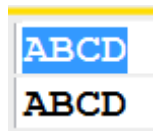
To switch from Production to Supervisor, see [users](#).

4. Modes and functions

A. Enter text and special characters:

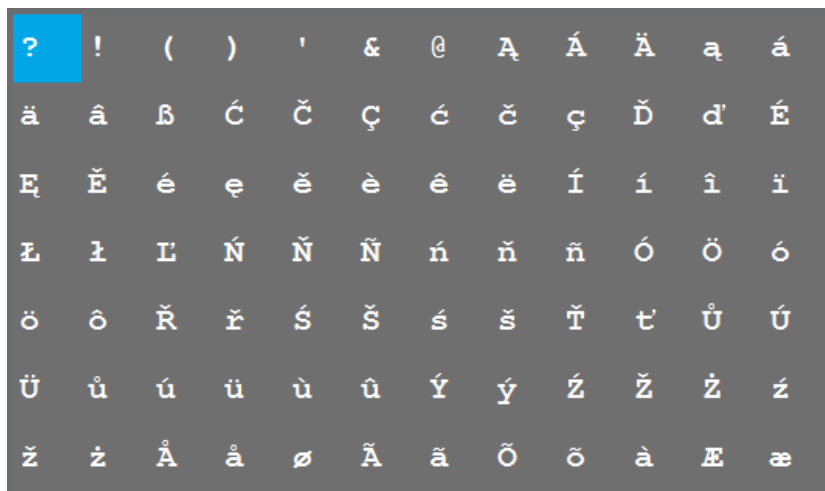
Entering the **text to be marked** on the current line is done directly thru the keyboard, at the insertion point shown by the cursor.

To move inside the text line, use the right and left *position arrows*. When changing line the text fully selected is highlighted by a change of colour:




Then use the right and left arrows to deselect the text, otherwise typing a character will replace the whole line selected.

It is as well possible to insert special characters using the *special characters* key. In that case, the following window will open:



The position arrows are then used to navigate inside the table. Use the insertion key:

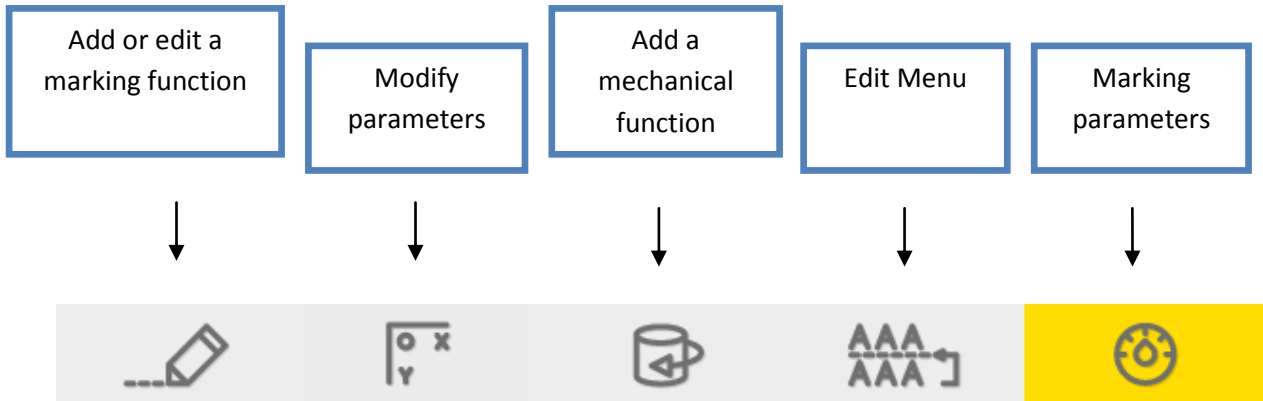
Confirm with: 



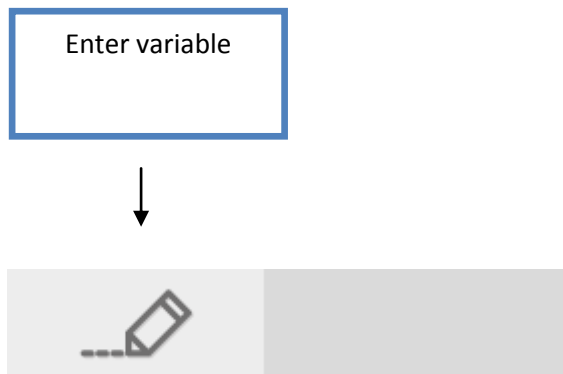
When the special characters window is open, it is still possible to type standard characters with the keyboard.

B. Home Mode: editing and inserting lines.

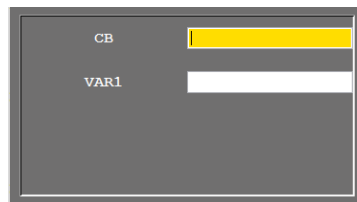
This is the default mode of the machine. In this mode, the tool bar offers the following functions to the *supervisor* user:



For a *Production* user, the tool bar offers only the key: *enter variable*, predefined



Pressing this key opens the following window: (See [Variables](#) or [Serial number](#)).

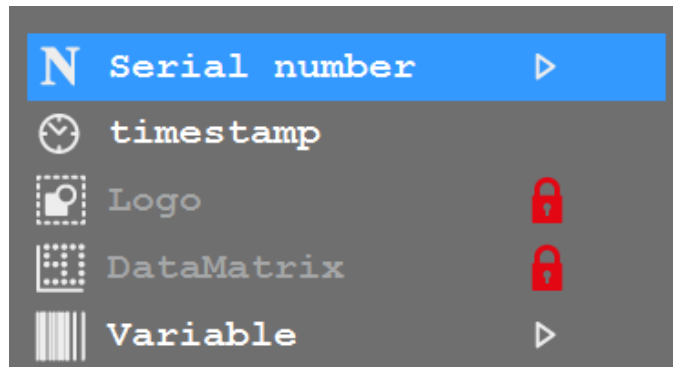



This feed variable or serial number window is also available to user *Supervisor* using the same button in combination with the *shit* key.

a) Marking functions

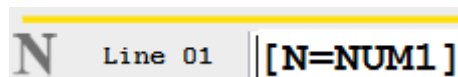
You can insert or edit marking functions using the *Add a marking function* key.

If no function is selected in the current line, a scrolling menu appears:



Select the function type and confirm with: .

If a function is selected in the current line, like in the following example:

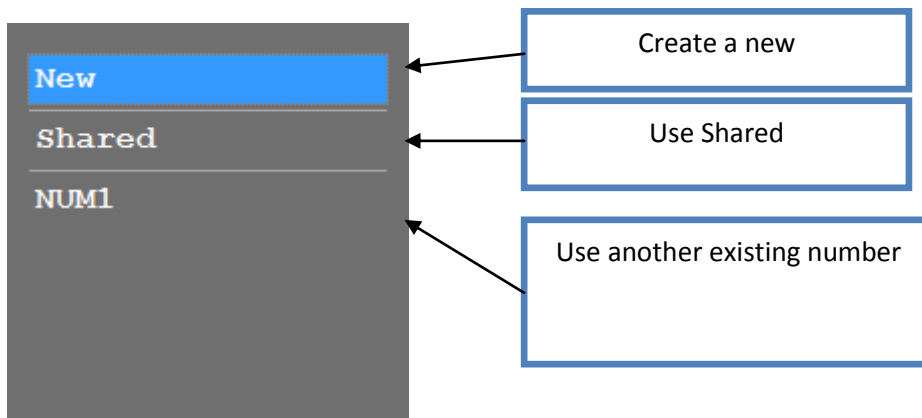



Then the configuration window for this function will appear

Serial number- Marking incrementing text:


A serial number is a text that will **increment** at the end of each marking. All serial numbers are for **one file**, except for the *SHARED serial number*, common to **all the machine files**.

A scrolling menu allows choosing among the different serial numbers.



To **insert** an existing serial number in a line, (other than *new*), select it and confirm with .

To **Edit** an existing serial number (other than *new*), select it and press the right arrow on the keyboard. The serial number configuration window opens.

To **create** a new serial number, select *new* and confirm with: . The serial number configuration window opens.

To **delete** a serial number, select it in the list and press the *erase* key on the keyboard.

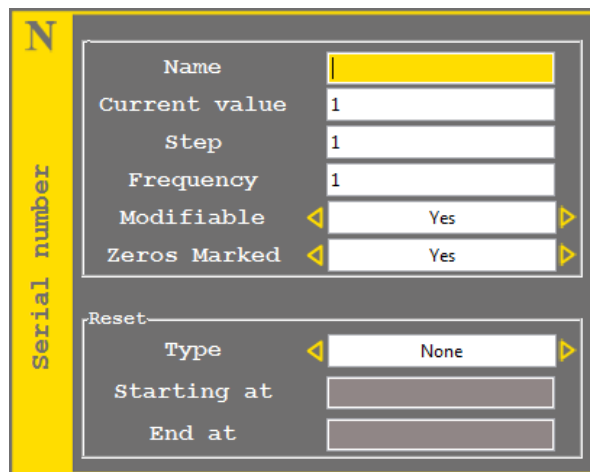


Deleting serial number reference in a marking line doesn't suppress the serial number.



To quickly feed a serial number, see [feeding variable window](#)

The configuration window is the following (creation mode):



The *Name* field correspond to the name of your serial number. It should be **unique** and different from *SHARED*. If you edit an existing serial number, this field is grey as you cannot modify it.

The *Value* field is the **current value** of the serial number. It will be incremented of the *step* value according to the defined *frequency* (number of markings)

For example the Value 2 will become 3 after 5 markings if the step is 1 and the frequency 5.

Other example: the value will change from 10 to 8 after 3 markings if the step is -2 and the frequency 3.

The number of characters (digits) shown in the *Value* field is very important as the serial number **cannot have more digits** than the original one.

For example, if the *Value* is 1, the serial number will increase until 9 then will start again from 1.

But if *Value* is 01, the serial number will increase until 99 before starting back from 01.


Zeros marked allows user to select if zeros beginning a serial number are marked or not. If positive, 001 will be marked as 001 else 001 will be marked as 1.

It is possible to reset the serial number automatically. Several choices are possible for this function:

- *None*: the serial number is never reset.
- *Day*: the serial number is reset every day.
- *Value*: the serial number is reset when it reaches the **maximum** value defined in *end at*.
- *Team*: the serial number is reset at each team change (see [teams](#))
- *Week*: the serial number is reset each week.
- *Month*: the serial number is reset each month.
- *Year*: the serial number is reset each year.
- *Hour*: the serial number is reset each hour.

The *starting at* field is the value given to the serial number when it is reset. The *end at* field is the maximum value used when we want a reset on the *Value* criteria.

Once again, the **number of digits** is essential for the *Starting at* and *End at* fields. There must be coherence, and therefore a **same number of digits for all this values**.

It is important to realise that **all blank fields (not grey)** should be filled up, otherwise an error message will be shown when confirming with .

The maximum number of serial number and variables accumulated in a file is 50.

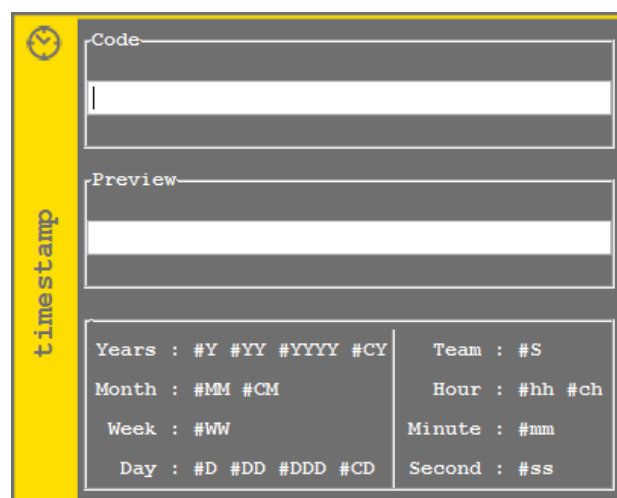
The serial number *SHARED* is a specific serial number. Common to all files, you cannot delete it.

Its **actual value** and **parameters** are valid for **all the files** where it is used.

Timestamp – Marking dates and time.

A *timestamp* is a type of variable containing **date** and/or **time** and/or **team name**. It is automatically updated by the system.

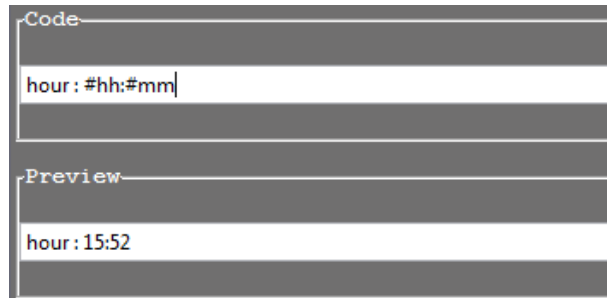
It is configured with the following window



Enter your text in the *code* field and enter the data as you wish, using the # sign before each entry, as shown in the examples at the bottom of the window.

In the *Preview* field you can see in live the result of your entry. (The actual message as it will be marked)

Example:




To configure time or teams, see [date parameters](#)

Logo - Marking shapes and drawings.

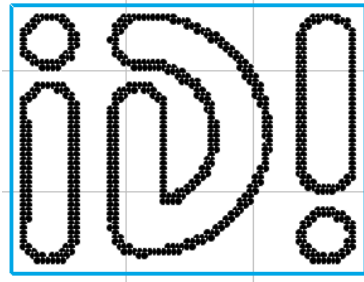
Inserting logos is an option requiring a licence (see [licences](#)). It allows inserting logos created with the **LogPro software** (from a computer) in a marking file.

When inserting (or editing) a logo, a window opens allowing you to select the desired logo in the list of all logo files available in the machine.



Select the logo and confirm with  .

The logo appears in the graphic view, as in this example of an IDI logo:



Datamatrix et QR Code

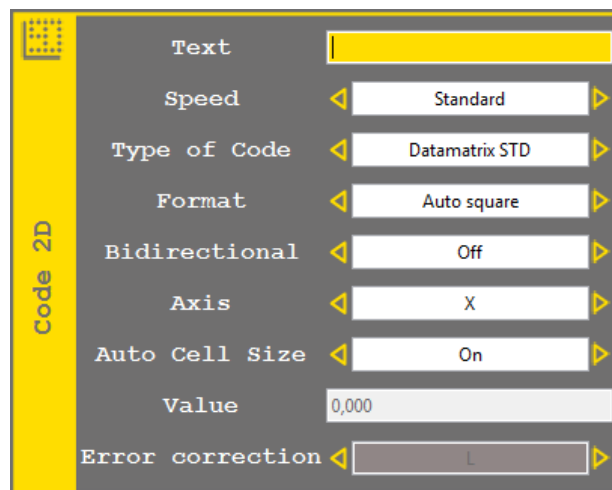
Datamatrix and QR codes are 2 dimensions bar codes available on your Multi4 marking machine as an option requiring a [licence](#).

Datamatrix code is a high density 2D bar code symbol, allow to record a high quantity of information on a small surface. It complies with norm ISO IEC 16022.

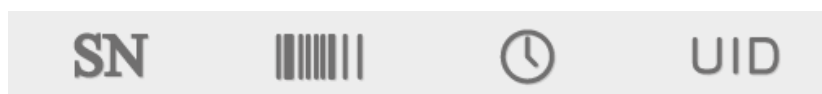
The **QR code** (QR for *Quick Response*) is a 2D bar code (datamatrix) composed of black modules arranged on a white square.

Note: this code type requires specialised equipment to ensure its reading.

The configuration window for a two dimensions code is as follow:



Text field correspond to the text to be encoded (240 characters maximum). **It cannot be empty.** The text can also contain [serial numbers](#), [variables](#), [Timestamp](#) or UID code reachable thru the tool bar:



Brackets “[”, “]” and no ASCII characters aren’t allowed in the text. Use the [UID codes](#) to add others characters.

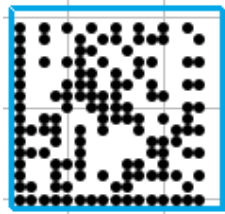
Speed corresponds to the marking speed. Marking speed is different from the rest of the file marking speed to obtain a quality suitable for code reading.

Code type corresponds to the two dimension code type to create: : Datamatrix STD (datamatrix standard format), Datamatrix GS1 (datamatrix GS1 format) or QR.

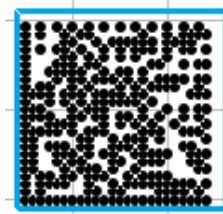
Format corresponds to the code format and depends on the *code type* selected.

- Datamatrix: The code can be automatic (rectangle or square) or at a fixed format selected in the list.
- QR: The code is always square. Its size is automatic or defined by one of the format of the list.

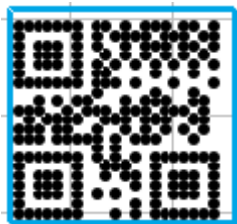
Format defines the **code size** (number of elements) but as well the maximum number of characters than can be encoded.



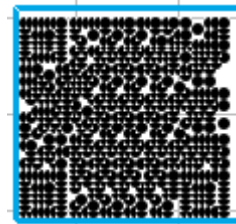
Datamatrix 16x16



Datamatrix 24x24



QR 21x21



QR 33x33

Bidirectional corresponds to marking head’s movement. If this parameter is activated, the marking head will move in both directions on the X or Y axis.

Axis corresponds to the marking axis. By default it will be the X axis.

Auto cell size corresponds to the size of datamatrix cells. If this parameter is activated, the 2D code size is the same as the line’s height. If this parameter is disabled, the field *Value* is available.

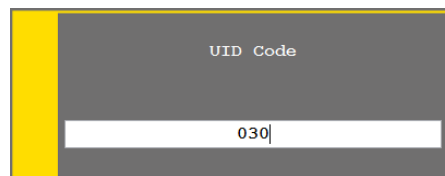
Value corresponds to the height of the datamatrix. This height is in mm or inch according to the machine's configuration. Cell size can't be under 0.05mm (0.002inch).

Error correction corresponds to the error correction used to create the QR code. Therefore it is available only for this code type. Four values are possible (L, M, Q or H); L being the lowest and H the highest. The more the error correction is high, the more redundant the code is; so the eventual reading problems (in case of scratch or other) are lowered. The lowest the error correction, the more characters can be encoded for a given format.



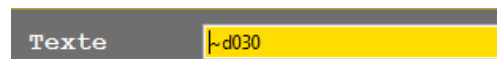
To delete a datamatrix or QR code, use the delete key in the [Edit](#) menu

UID code button allows user to insert UID code in Datamatrix Text. As pressed, the following windows open



Fill the UID code number in a 3 digit mode, for example 030 for <RS> and validate

In the datamatrix text field, the UID code number is added with specific coding, ~d030 in the previous example.



To suppress an UID code, delete all characters using the delete key, specific coding (~d) included.

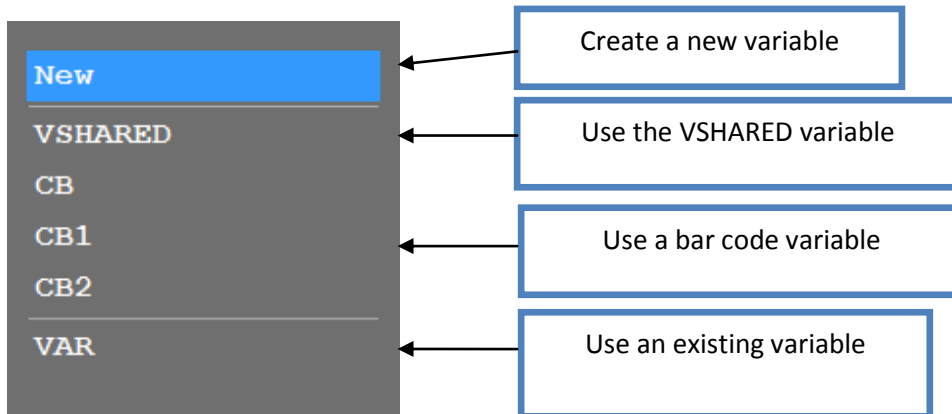
Variable and Bar Code


A variable is a **non-frozen text** with fixed parameters, which can be changed at each marking, either manually or with a bar code reader connected to the machine.

All variables are for **one file**, except for the *VSHARED variable*, common to **all the machine files**.


When a variable is inserted inside a marking line, it is the value of this variable which is marked.

A scrolling menu allows choosing among the variables.





To **insert** an existing variable (choice other than new) in a line, select it and confirm with 

To **edit** an existing variable (choice other than new) in a line, select it and press the arrow at the right of the keyboard. The variable configuration window opens.

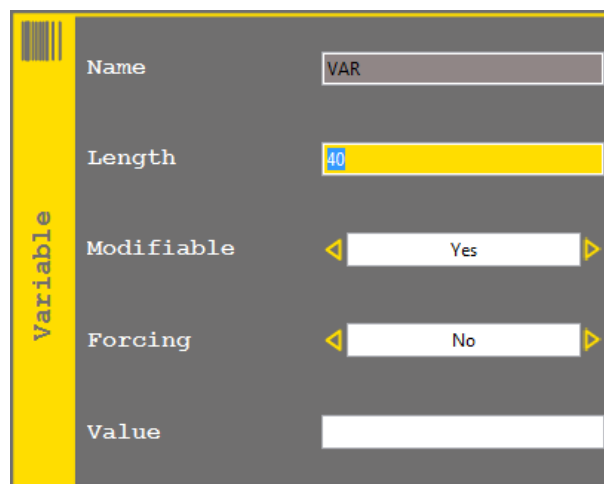
To **create** a new variable, select *new* and confirm with . The variable configuration window opens.

To **delete** a variable, select it in the list and press the *erase* key on the keyboard.

 Deleting variable reference in a marking line doesn't suppress the variable.

 To quickly feed a variable, see [feeding variable window](#).

The configuration's window is :



Variable	Name	VAR
	Length	40
	Modifiable	Yes
	Forcing	No
	Value	

Name field correspond to the name of your variable. It must be unique and different from CB, CB1, CB2 and VSHARED. If you edit an existing variable this field is grey as you cannot modify it.

Length field correspond to the number of characters of the variable. If the value of the entered variable is longer than *Length*, it will be shortened (cut) to the number of characters of *Length*.

Modifiable field defines if a Production User can modify the variable. If *modifiable* is set to *No*, the following field, Forcing is not reachable.

Forcing field allows changing the value of variable at each marking. It is then compulsory to enter a value at each marking.

Value field is the actual value of the variable.

CB variables (CB, CB1 and CB2) settings present an additional field:



The allocation allows to define the way CB variables are fed when more than one are used.

- Sequence: Variables are fed in the order they are scanned. The first scan feed CB, the second CB1 and the third CB2.
- Length: bar code length corresponds to a variable length and the variable is fed with the read content.

The maximum number of CB variables is 10 (CB, CB1... CB9).

The maximum number of serial number and variables accumulated in a file is 50.

If a variable is forced and non modifiable, it will be filled using a command via the RS232 serial link or using a handheld scanner.

Variable value may be truncated using a special coding in the marking line. Insert code #AA,BB# next variable code in the marking line where AA stands for the index of the first character used and BB the last.

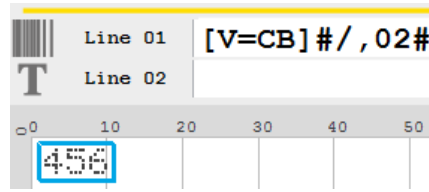
For example, to use only the third to the eighth characters from variable VAR value, the marking line would be

[V=VAR] #03, 08#

As the variable VAR contain the text **ABCDEFGHIJKLMN**, the string **CDEFGH** will be marked.

If the variable contained separators, for example a slash "/", can be cut them up in blocks with the code #S,AA#.

If the value of the CB variable is 123/456/789, you can get the second block with the following line.



b) Modify parameters

The *parameter modification* allows modifying the marking lines parameters of the file using the following **table**:

Line	T	X	Y	↑↓	M	⋈	∠
1	ABC	2.0	5.0	3.0	1	1	0.00
2	DEF	2.0	8.6	3.0	1	1	0.00
3	123	2.0	12.2	3.0	1	1	0.00

Use the position arrows to navigate in the table.

Line indicates the number of the considered line

T indicates part of the line text.


X and *Y* give the positions of the line beginning in the selected units (mm or inches)


↑↓ gives the height of the line in the selected units (mm or inches)

M gives the marking force from 1 to 6


⋈ gives the dot matrix chosen from 1 to 7.


∠ gives the line angle in degrees


 gives the diameter used in case of a circular marking, in the selected units (mm or inches)


 gives text compression from 50% to 150%

 gives spacing between characters from 0 to 9

 gives the italic inclination of the text from 0 to 9.

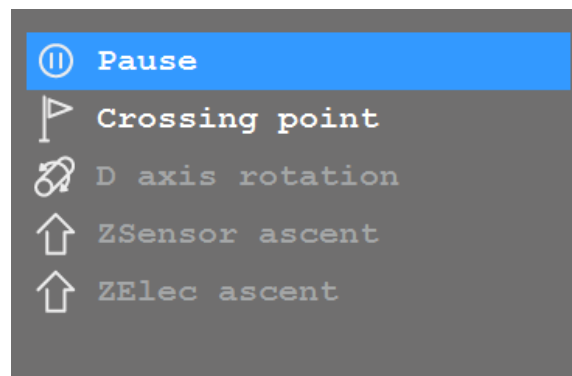
 gives the number of impact for each marking point, from 1 to 9.

Use key  to confirm your modifications.

Use key  to cancel your modifications

c) Add a mechanical function

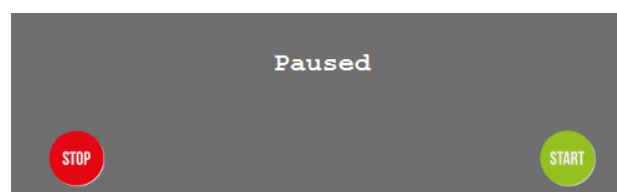
Pressing *add a mechanical function* key shows the following scrolling menu:



Pause – Set a pause during a marking process

A marking line can have a pause status.

In that case the marking is done for the lines defined before this pause, and then the marking stops for a pause

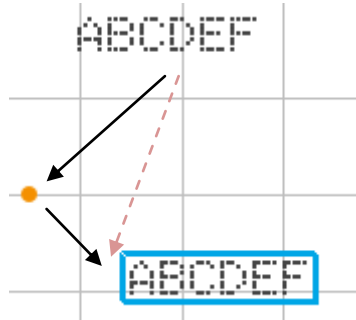


Use the *Start* and *Stop* keys to stop or cancel the marking in progress. (see [Marking](#))

Crossing point – Command the head to move thru a point.

It is possible to force the head to move thru a defined point.

When a crossing point is defined, it is shown on the graphic view as an orange dot.



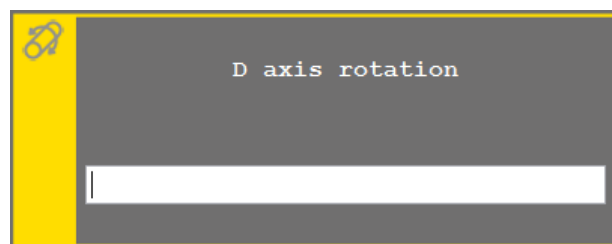
In the example shown above, the marking head will move following the black arrows between the two lines to be marked, because we have inserted a crossing point(instead of using the direct red way)


Use the line position (see [position mode](#) or [modify parameters](#)) to **position** correctly the crossing point.

Using crossing points makes possible to define marking head position circuits sometimes useful for parts with complex shapes.

Add a D axis rotation – Make the D axis turn of a given angle (depending on options)

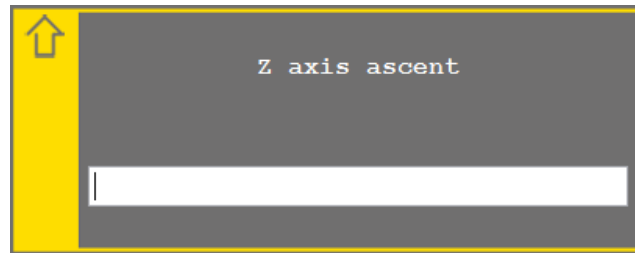
If you have the D axis rotation option, you can force the axis to rotate during the marking. This feature is available only is the rotation axis is configured in generator mode (see [marking parameters](#))




Enter the desired rotation angle in **degrees** and confirm with  .

Add Z Sensor or Z Electric ascent.(depending on options)

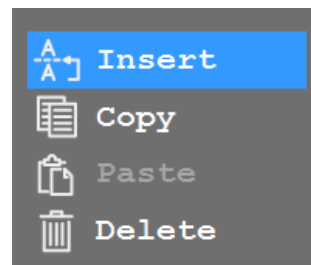
If you have the option third [Z Sensor axis](#) or [Z electric](#), you can force the axis to ascent during the marking. This feature is available only if the marking file is configured to work with Z sensor axis or Z electric. (See [marking parameters](#))



Enter the value of the desired ascent in the used unit (mm or inches) and confirm with .

d) Edit Menu

Edit Menu is a scrolling menu allowing to select common publishing operation:



Insert allows inserting a new line between two existing ones. To use line insertion, select with the up and down **arrows the line on top of which** you intend to insert the new line and chose *insert*.

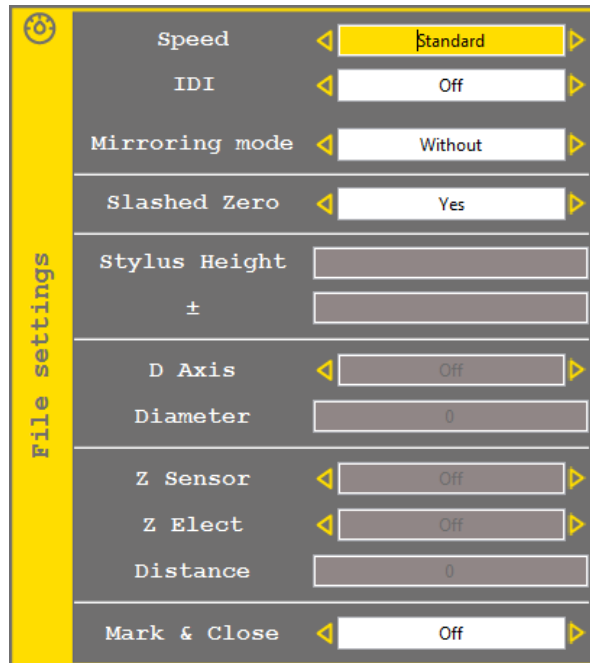
Copy allows copying a marking line, with all its parameters.

Paste allows inserting a line previously copied.

Cancel allows to delete the current line. A confirmation message is displayed before it is deleted.

e) Marking parameters: Speed, IDI and options

The *marking parameters* button displays the window to configure the parameters:



- *Speed*: marking speed from very slow to very fast. The fastest the speed is, the more the risks to alter the marking quality are high. (Avoid high speed with very little characters). The "Max" speed can significantly reduce the marking quality.
- *IDI* allows configuring IDI mode for the current marking file. There are 3 IDI modes :
 - Off (no IDI)
 - IDI flat mode
 - IDI curved mode

For more *information* on IDI use, please refer to [Force- IDI](#).

- *Mirror mode*:

Allows to return horizontally or vertically the character marking (to be read as in a mirror)

Vertical Mirror 

Horizontal Mirror 

- *Crossed zero*: Allows choosing appearance of digit zero. By default the zero digit is crossed, but it can appear not crossed.

Crossed Zero : 

Non crossed zero 

- Stylus height and \pm : values allowing the use of the stylus watch. Height must be between 1 to 9mm and the delta between 0.5 and 2.5mm. More information about this feature in [maintenance](#) chapter.
- D axis : allows configuring the use of **optional** D axis for the file.

D axis Accessory must be activated beforehand in [accessories](#)

There are 3 possible options for D axis:

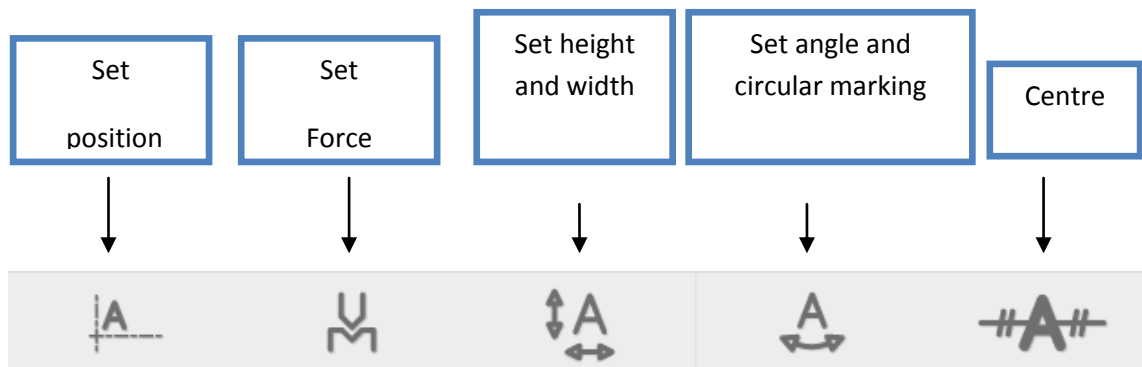
- **None** : marking is made without D axis
- **Circumference**: The marking is made on the part circumference.
- **Generator**: The marking is done in x y, so flat.


For more information about D Axis option use, see [D Axis](#).


- *Z Sensor*: Allows configuring the use of **optional** Z sensor axis for the file. When using Z sensor axis, you must enter the distance (height) where the marking head should be positioned. This distance is the distance **stylus-part**. Z axis must have been previously activated in [accessories](#)
- *Z Electric*: Allows configuring the use of **optional** Z electric axis for the file. When using Z electric axis, you must enter the course (distance between the high machine position and the end of the move). The machine will go down of the entered value and start marking. Z axis must have been previously activated in [accessories](#)
- **Mark & close** : if this function is active, the current marking file is closed after marking preventing from an unexpected double marking of the same file. A new empty file is created and if automatic backup is enabled the file is saved before closing it.

C. Position Mode - Force

Position mode allows configuring your marking line. You may as well change the following characteristics by pressing one of the buttons:



 Combined use of those keys with the *shift* key allows applying those modifications to **all the marking lines**.

 This tool bar is only available in *Supervisor Mode*

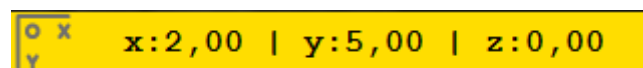
a) Set position – Easy shift

Pressing *Set Position* key allows using the *position arrows* to position the current line with steps from 0.2 to 1.6mm.

The key stays in the press state during modifications:





The position is visualised on the **grid** and the position (origin point at bottom left of the line outline) and the z axis position is shown in a window at the top left of the screen.



Positioning actions are simultaneously commending **marking head position** if the *easy shift* function is activated.

Easy shift function allows precise positioning at the part to be marked level. To activate or deactivate this function, see [advanced parameters](#).

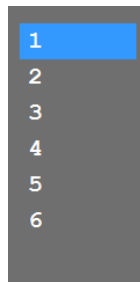
Use  key or press again on the key to confirm your modifications

Use  to cancel your modifications.

Note: you can use the combined command: *shift + easy shift* to displace all the lines

b) Set force – IDI

Pressing *Set Force* key allows displaying the force selection scrolling menu:



The selected force is grey. Use the up and down position arrows to select another value.

The depth of the marking depends on the **strike force**, but as well on **the distance between the stylus and the part**. In the case of the Multi4 mini portable head it is not possible to change the stylus distance. For all other marking heads, it is recommended to use the following distances stylus/part for the 5 forces:

- Force 1 : distance of 1 mm
- Force 2 : distance of 1.5 mm
- Force 3 : distance of 2 to 4 mm
- Force 4 : distance of 5 to 8 mm
- Force 5 : distance of 5 to 8 mm
- Force 6 : distance of 5 to 8 mm

Respecting those distances is very important to obtain a good result.

For weak force (1, 2 even 3), If the stylus is too far it will not even touch the part when marking.

For high force (4, 5 and 6), the furthest the stylus (within its possible run), the strongest the hit will be.

Note: marking little characters with a high force can make reading impossible.

To reduce the obligation of distance setting, Technomark allows you to use the **IDI technology** (Function not available with the Multi4 mini marking head).

When activating the IDI function (see [marking parameters](#)) a **suitable marking depth** is applied, whatever the distance stylus/part is, in the **range of 1 to 8 mm** to ensure a constant rendering.

When the *IDI* function is activated, the machine makes a test impact to evaluate the distance and adjust the force used to correspond to what is asked for.


IDI function is available in two different modes:

- *Flat mode*: The test impact is done at each beginning of line. This is ideal for flat shapes, with little slope.
Note: Ideal to have the same hitting depth on the part, without worrying about the distance.
- *Curved mode*: The test impact is done at each beginning of character. This mode allows a constant depth when marking on cylinders, corrugated parts, ...
Note: Ideal to mark parts with a constant depth when they present an uneven distance along the length of the marking.



Marking with IDI curved mode and without IDI

The IDI mode is displayed on the main screen with the following icons:

 IDI deactivated

 IDI flat

 IDI curved

c) Setting height and width

Pressing on *Set Height and Width* allows using the position arrows to change height and compression of the current line.

Setting the height the minimum value is 0.4mm, the maximum value 200mm and, steps vary from 0.2mm to 1.6mm. Setting the compression the minimum value is 50%, the maximum value 150% and steps vary from 5% to 40%.



The key stays in the pressed state during the modification:

The Up and Down position arrows allow increasing and decreasing the height. As the width is dependant from the height, it will vary proportionally.

The left and right position arrows allow increasing and decreasing compression. Compression is used to deform characters and modify the width, without changing the height.

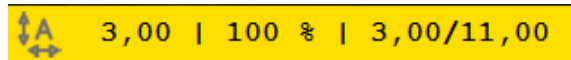


Normal compression




compression: 50%

The height, compression values as well as the overall dimensions of the line on X and Y axis are indicated in a window at the upper left of the screen:



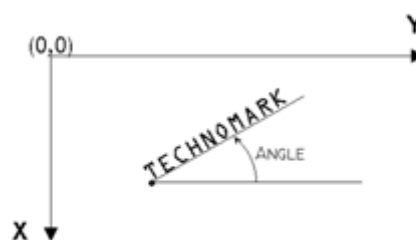
Use  , or press again the key to confirm your modification.

Use  to cancel your modifications.

d) Set angle and circular marking (circular text).

Pressing *Set angle and circular marking* allows using the *position arrows* to adjust the angle and the diameter for circular marking.

Up and down arrows modify the angle of the current line by steps from 2.5° to 20°.




Right and left arrows modify the diameter to mark a circular text by steps from 0.25mm to 2mm.


If the diameter value is positive, the **bottom** of the characters is aligned on the virtual circle. If this value is negative, then **the top** of the characters is aligned on the circle.



In this example the same text (ABCDEF) is done with a positive diameter value (left) and with the same value but negative (right)

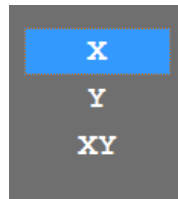
By default, the machine sets the beginning point a 0 (parallel to the X Axis). To modify the beginning point, you only have to modify the value of the line angle

Use  , or press again the key to confirm your modifications.

Use  to cancel your modifications.


e) Centre

Pressing the *centre* key allows displaying the centring menu:



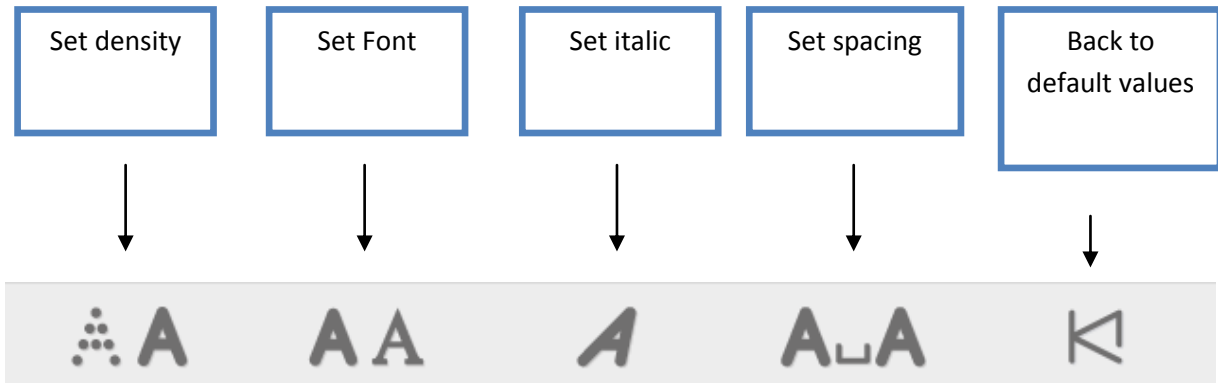
- X : allows centring the line following X axis
- Y : allows centring the line following Y axis
- XY: allows centring the line following X and Y axis, so in the middle of the marking window.


Use  , or press again the key to confirm your modification.


Use  to cancel your modifications.

D. Text parameters mode

The *text parameters* mode allows configuring the line text aspect. You can modify the following characteristics by pressing one of the buttons:

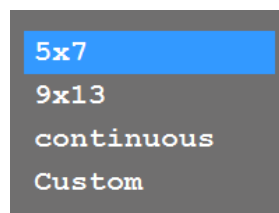


 Combined use of those keys with the *shift* key allows applying those modifications to **all the marking lines**.

 This tool bar is only available in *Supervisor Mode*

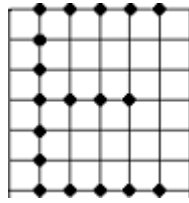
a) Set Density – Change dot matrix

Press *Set density* key allows displaying the dot matrix choice scrolling menu :

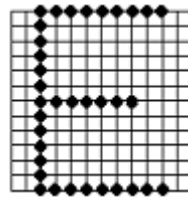


- 5x7 : characters are defined by a 5x7 matrix
- 9x13 : characters are defined by a 9x13 matrix
- Continuous: character points are spaced every 0.2 mm
- Custom: permits to set a spacing between dots (useful to allow an easier reading with very large characters)

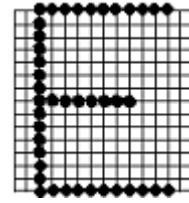
The matrix in use is grey. Use the up and down position arrows to choose another value.




5x7




9x13

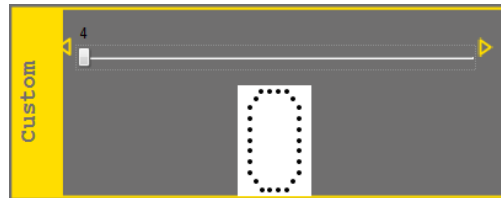


continuous


Use  , or press again the key to confirm your modifications.


Use  to cancel your modifications.

If you selected *Custom*, the following window will appear to allow setting of the spacing



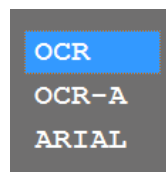
Right and left position arrows modify the spacing value which will be shown immediately. The possible values are: 0.3 mm, 0.45 mm, 0.6 mm, 1 mm between the dots.

Use  , or press again the key to confirm your modifications.

Use  to cancel your modifications.


b) Set Font type


Touch *Set font* key allows displaying the font type choice scrolling menu:



The font in use is grey. Use the up and down *position arrows* to choose another value.


- OCR is the standard font of your marking machine
- OCR-A is a specific font adapted to machine character recognition but is more difficult to read by human eye (**ISO 1073-1:1976**)
- Arial is close to the known font Arial. Only the dot matrix 18x26 is available with this font.

Use  or press again the key to confirm your modifications.

Use  to cancel your modifications.

c) Set Italic

Pressing *italic set* key allows using the position arrows to configure the incline of the current line text.

The key stays in the press state during the modifications: 

Right and left or up and down arrows allow increasing or decreasing the incline value.

The italic value is indicated in a window at the top left of the screen:




A straight text has an italic value of 5. This value can vary from 0 to 9; below 5 the text leans to the left and above 5 the text lean to the right.




Italic: 0




Italic: 9

Use  or press again the key to confirm your modifications.

Use  to cancel your modifications.

d) Set spacing

Pressing *set spacing* key allows using the position arrows to configure the character spacing of the current line text.

The key stays in the press state during the modification: 

Right and left or up and down arrows allow increasing or decreasing the spacing value between the characters.

The spacing value is indicated in a window at the top left of the screen:




A standard text has a spacing value of 4. This value can vary from 0 to 9; below 4 the text is narrowed, and above 4 it is widened.




Spacing : 0



Spacing : 9

Use  or press again the key to confirm your modifications.

Use  to cancel your modifications.

e) Back to default values.

Pressing *back to default values* allows restoring the default text parameters for the current line.

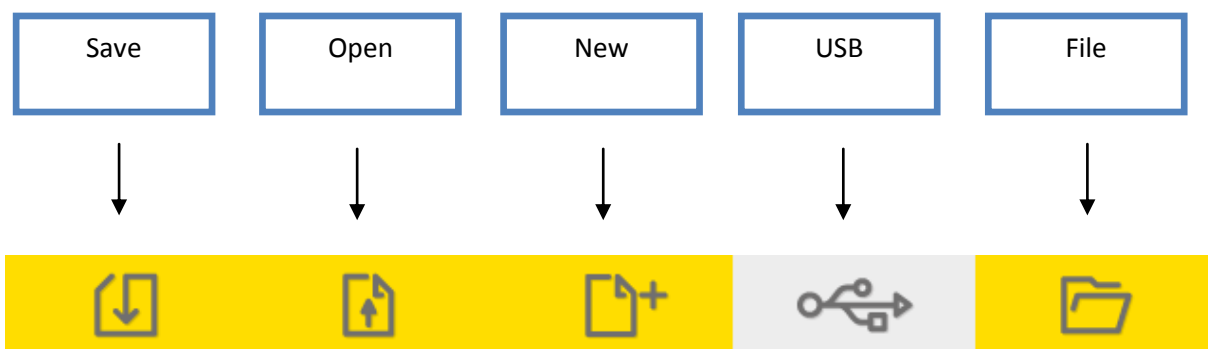
These parameters values are:

- Matrix : 5x7
- Font : OCR
- Italic value : 5
- Spacing value : 4

E. File Mode

File Mode allows configuring the marking files.

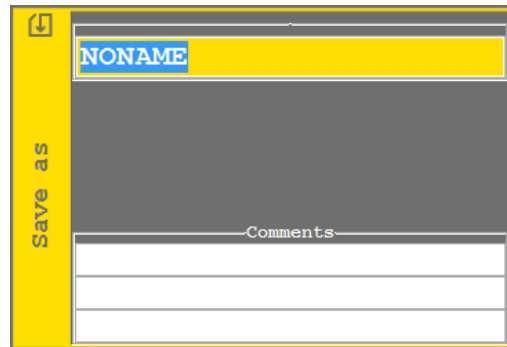
The different functions proposed in *supervisor mode* are the following:




In *Production Mode*, *New* and *File* are not available.

a) Save

Save allows saving the file

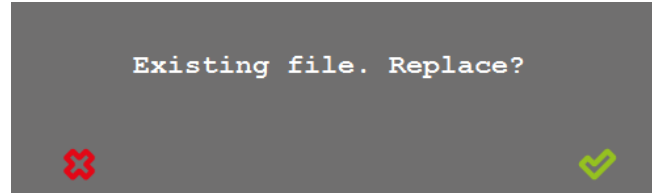



Enter the file name, enter (if you wish) up to 3 lines of comments and confirm with 

This window opens even if the file has already been saved. It allows changing the file name (function: *save under*)

The filename can only contain alphanumeric letters, dashes "-" or underscores "_".

If the file name already exists, a confirmation will be asked:



Confirm with  .

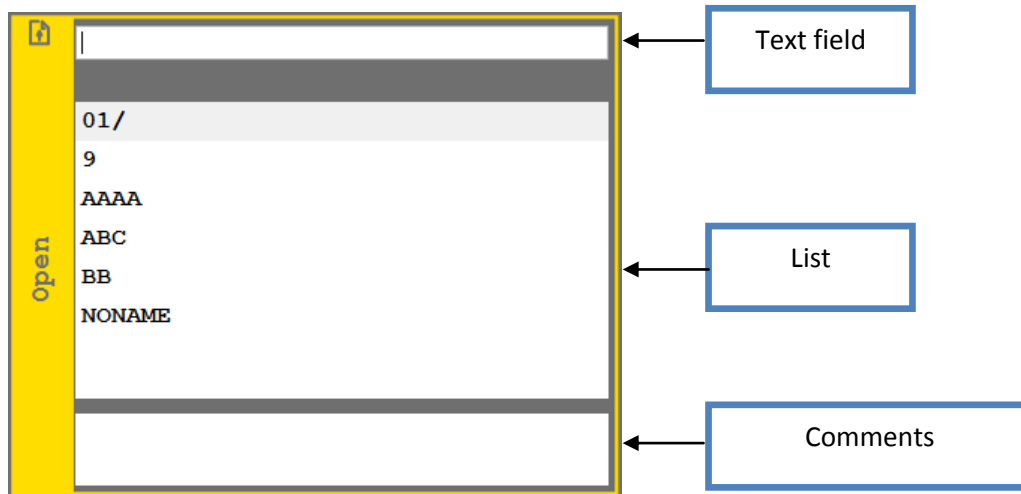
The folder icon at the bottom right of the window allows you to select the subfolder in which you want to save the file.

Filename is maximum 19 characters long.

Each comment line can contain up to 31 characters.

b) Open


Open allows opening a file from memory.



You can type the file name (or the first characters) in the allocated field, the right and left arrows allow to move inside the text field. The corresponding file will be underlined in the list.

Files will be sorted alphabetically, lowercase names will be before uppercase names for files beginning with the same letter.

The file can as well be selected using the up and down arrows to move in the list.

Select the file to open with .

The wastebasket key deletes the selected file.



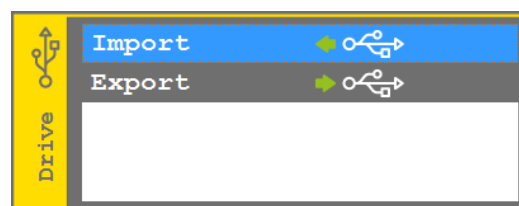
c) New

New allows creating a new file. This file will be empty.

d) USB

USB allows importing and exporting files with a USB key. This button appears only if a USB key is connected.

USB key must be formatted FAT or FAT32, in order to be recognised by the machine.



Import recovers automatically all the marking files and all the logos saved on the USB key and save them on the controller. If the name of a file contains non-ASCII characters, they will be replaced with the character "!". If the filename contains spaces, they will be replaced with a low hyphen "_".

For example, if the name of a file is "1 to 3 4", it will be renamed "1! 3_4!".

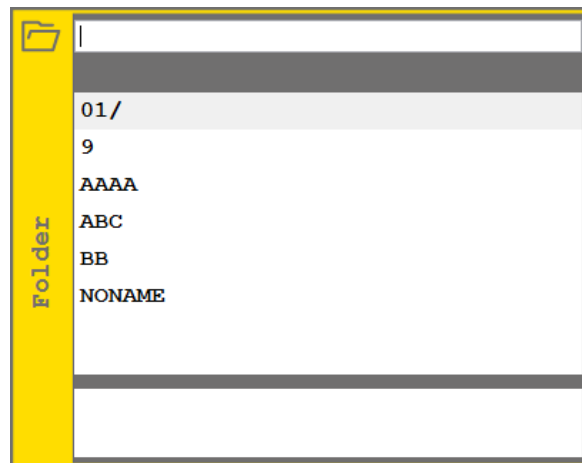
Export save all the marking and logo files from the controller onto the USB key.


e) Folder

This feature allows creation of sub folders in the main folder to sort marking files with the following

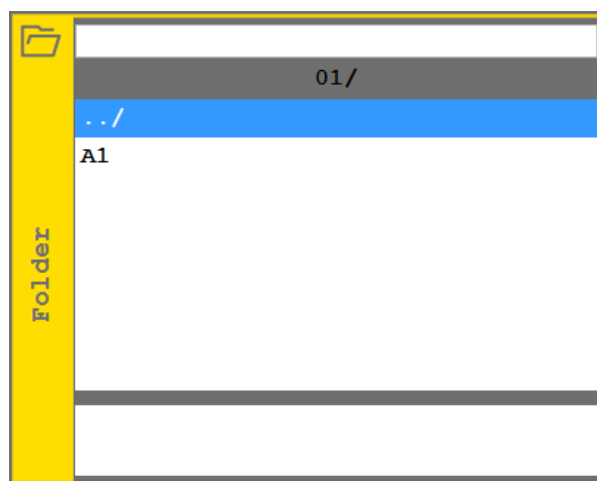
button: 

This window contains the list of marking files and sub folders in the machine. Folder names are identified with the slash "/" at the end of the name.

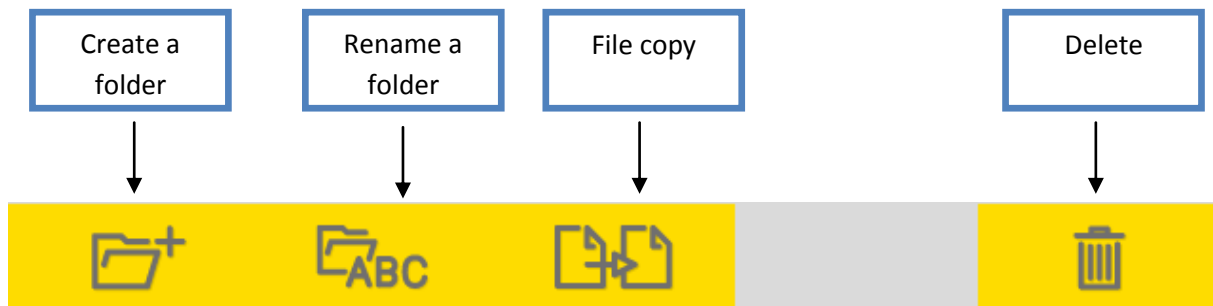


Select a folder by pressing the key  .

If you are in a sub folder, the main folder is ".. /". The name of the current sub folder is displayed under the text field.

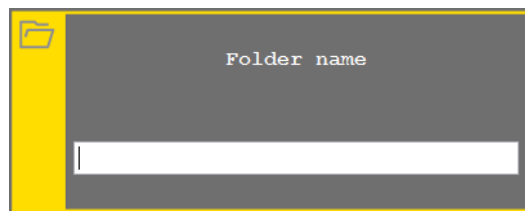



Folder's features are as follow:



Create a folder

Create a sub folder is only available in the main folder. A window appears to choose a sub folder name.



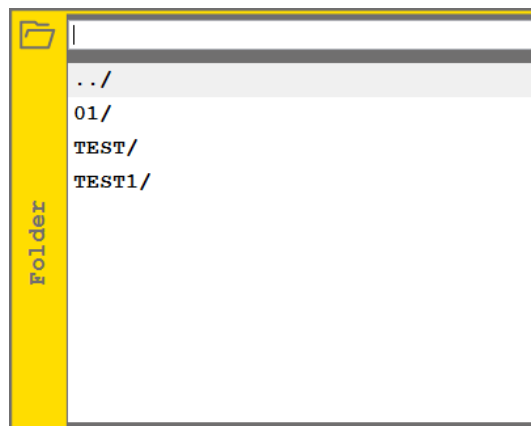
Only alphanumeric and dash “-“characters are allowed. Press the  key to create the sub folder and close the window.


Rename a folder

If a folder is selected in the main folder, a window appears to choose a new name of the sub folder

File copy in another sub folder

If a file is selected, a window appears with the list of sub folders in the machine.



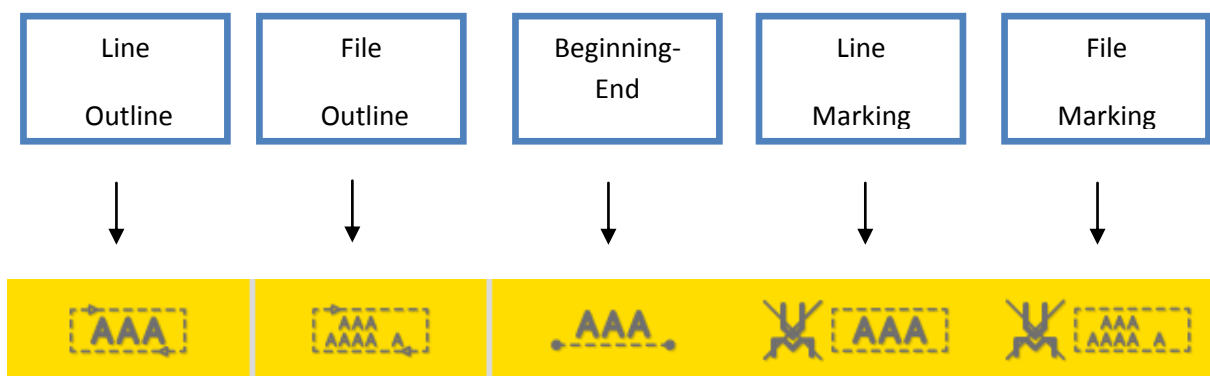
Select a sub folder and press the  key to confirm it.

Delete a folder

This feature allows you to delete a sub folder. Marking file can be deleted in this menu too.

F. Test Mode

In *Test Mode* the tool bar presents the following buttons:



Any of the tests can be set to pause/restarted/stopped in the same way than a marking.

(See [marking](#))

a) Line Outline Test

Line Outline allows testing the current line outline. The marking head is moving around the line, marking its outline.

b) File Outline Test

File Outline allows testing the full file outline. The marking head is moving around the assembly of all the lines, marking the **global outline**.

c) Beginning-End Test

Beginning-End Test allows to move the marking head from the beginning to the end of the current line..

d) Line Marking Test

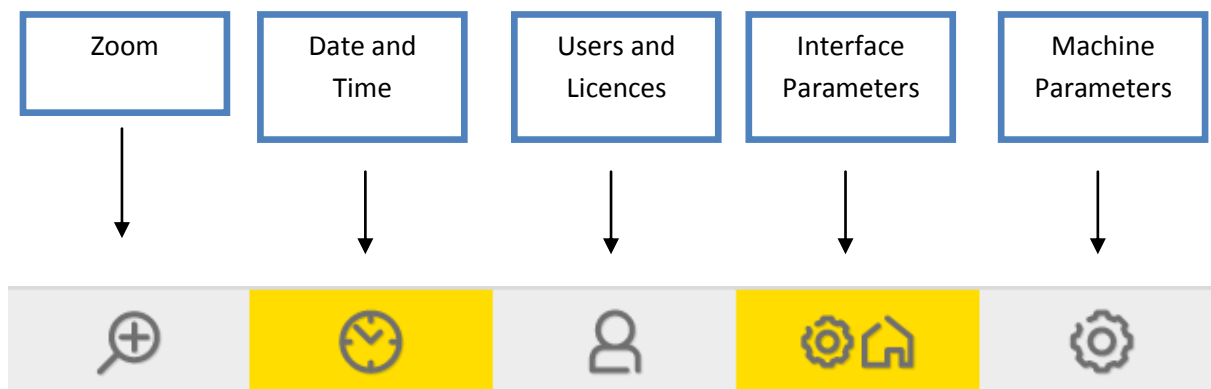
Line Marking allows testing of the current line. The marking head follows all the movements of the real marking, but without any impact.

e) File Marking Test

File Marking allows testing of the complete file. The marking head follows all the movements of the real marking, but without any impact.

G. System Mode.

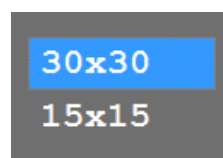
System mode allows the user to configure its marking system. The tool bar presents the following functions.



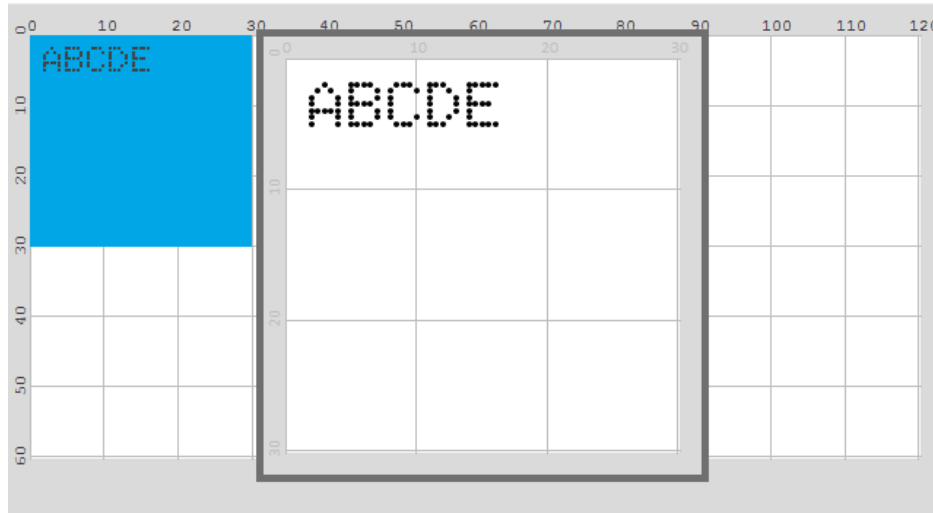
In *Production Mode*, only *Zoom* and *Users* functions are available.

a) Zoom



Zoom allows watching a part of the marking file at a different scale. Pressing *Zoom* displays the scrolling menu allowing to select the size (in mm) of the zoomed part:



Select the zoom size and an enlarged view is superposed on the screen:

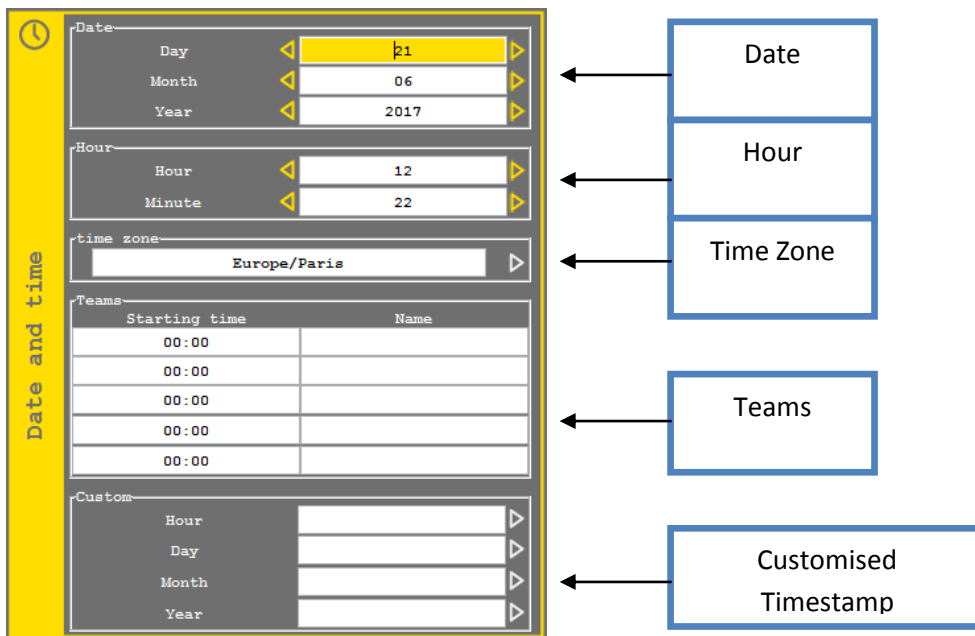


An Orange square appears in the view part: it represents the enlarged part. It moves using position arrows and the zoom window updates depending on its position.

Use  or  to close the zoom window.

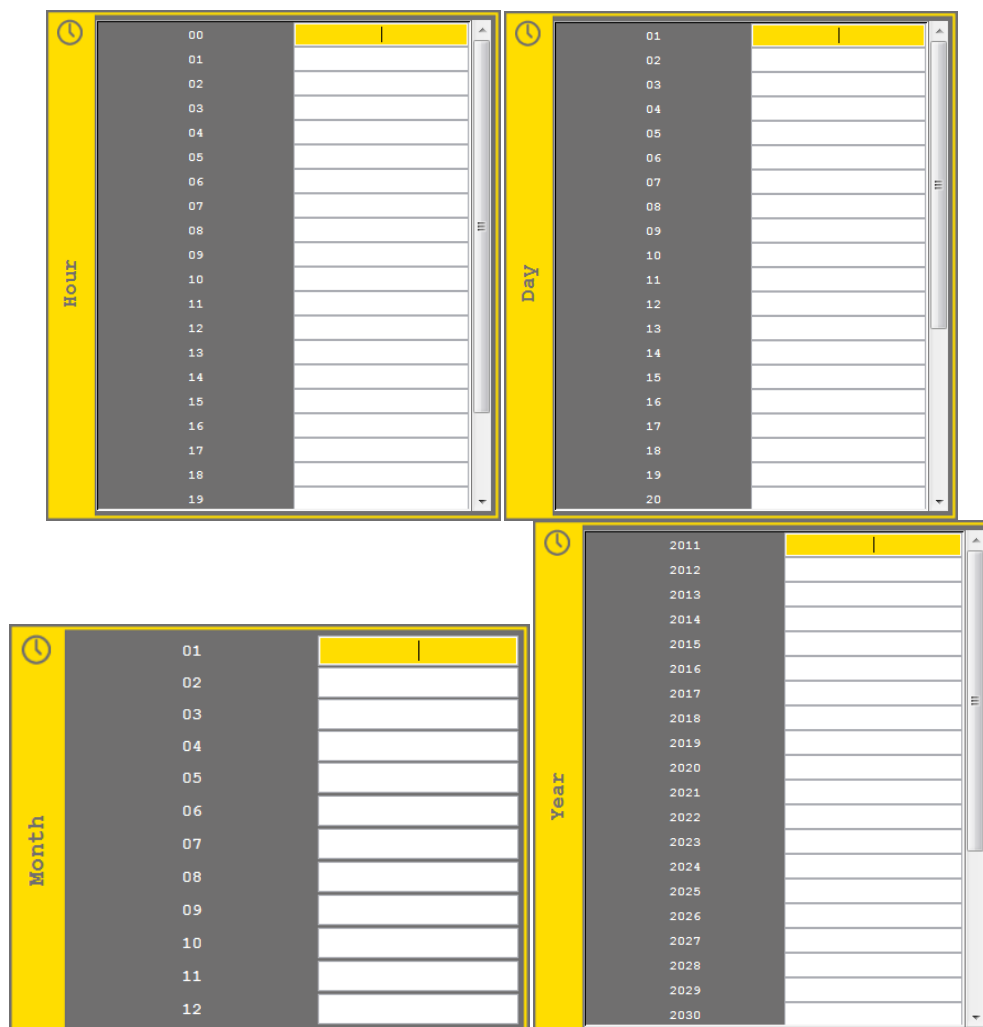
b) Date and Hour- Teams configuration

Date and Hour function allows configuring the date and time of the controller, as well as the time zone and the shift-teams turnover using the following window:





Navigating inside the window is done with the up and down position arrows.

- **Date:** The three fields, *day*, *month* and *year* are modified by scrolling the values with the right and left *position arrows*.
- **Hour:** *Hour* and *Minute* fields are modified by scrolling the values with the right and left *position arrows*.
- **Time Zone:** To change time zone, use the right *position arrow* and select the time zone corresponding to your geographical zone in the proposed list. Configuring your time zone allows automatic changes between summer and winter time.
- **Teams:** You can configure up to 5 shift team on you marking machine. You must define for each team the starting time (format HH:MM) and the name (up to 10 characters). Teams are used in the Timestamp part. Use the up and down *position arrows* to go from one field to the next.
- **Custom:** You can define a customised timestamp format for Hour, Day, Month, and Year. Use the right *positioning arrow* to open the corresponding editing windows:



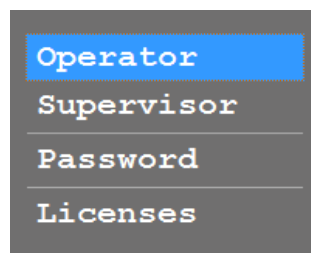
Enter a character for each of the fields.

Use  to confirm your modifications.

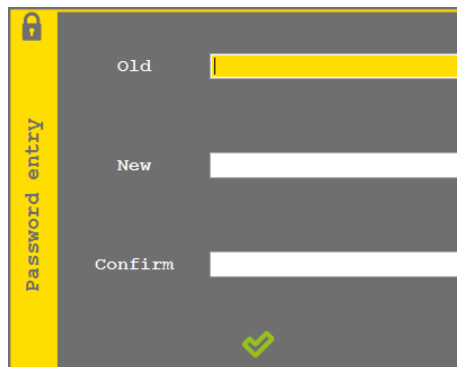
Use  to cancel your modifications.

c) Users and Licences

The Users and Licences display the following scrolling menu:

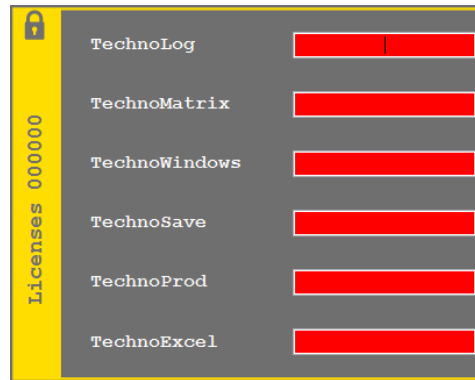


- *Production*: allows to be identified on the machine as a Production User, with limited capabilities.
- *Supervisor*: allows to be identified on the machine as a Supervisor User, with all capabilities. If this account has been protected by a password, the machine will ask your identification.
- *Password* : allows to change the supervisor account password with the following window :



There is a universal password “MULTITEC” if you forget your current password. This password allows you to be in supervisor mode or to change the forgotten password by typing this password in the “old” field.

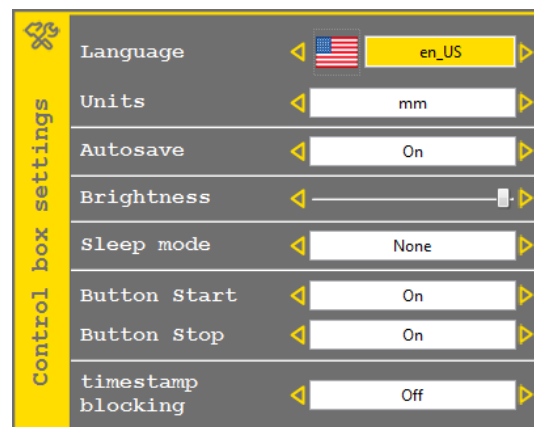
- Licences (Option) : Allows to enter your licences number with the following window :



If the entered licence number is valid, the field will change colour from red to green. The number in the title of the window is your machine serial number which will be asked for if you wish to obtain a licence number.

d) Interface Parameters – Language – Autosave –Standby

The Parameter Interface allows configuring several parameters with the following window:





Navigation in the window is done with up and down *position arrows*:


- **Language:** Language of your machine can be modified using the right and left position arrows.
- **Units:** Units of your machine can be modified using the right and left position arrows.
- **Auto-Save:** Automatic save of the current file (on power fail) can be activated/deactivated using the right and left position arrows.
In Operator mode, marking files are automatically saved when loading a new file.
- **Brightness:** Brightness of your machine can be adjusted using the right and left position arrows.
- **Sleep mode:** Sleep mode (energy save) of your machine can be modified using the right and left position arrows. The machine will be wake up by any external event (keyboard, USB

drive, barcode reader...). The first character enter won't be taken into account. In average or high sleep mode the battery won't charge.

- *None* : no sleep mode
- *Average*: After 5 minutes without activity, the screen shuts off, the motors power is interrupted but the standard outputs stay active. The consumed energy is halved.
- *High*: After 5 minutes without activity, the machine goes into deep sleep, with a consumption mode as low as possible (a few milliamps). The machine wakes up from any outside event (keyboard, USB key, ...)
- *Button start and stop*: this parameter allows to block start or stop button on the lexan if it is on OFF.
- *Timestamp blocking*: this parameter allows to block timestamp at the date and time at the beginning of the marking. If there is a pause in the marking file, timestamps won't change before and after the pause.

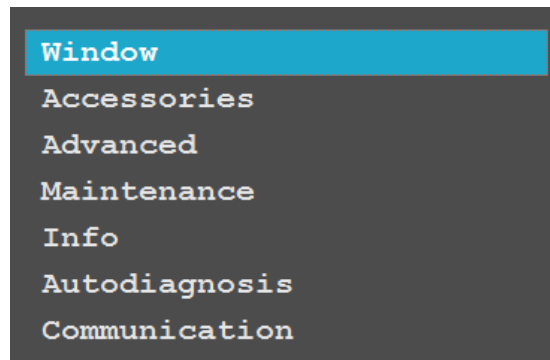
The tool bar offers button:  allowing to **reset to Zero** the marking counter..

Use  to confirm your modifications.

Use  to cancel your modifications.

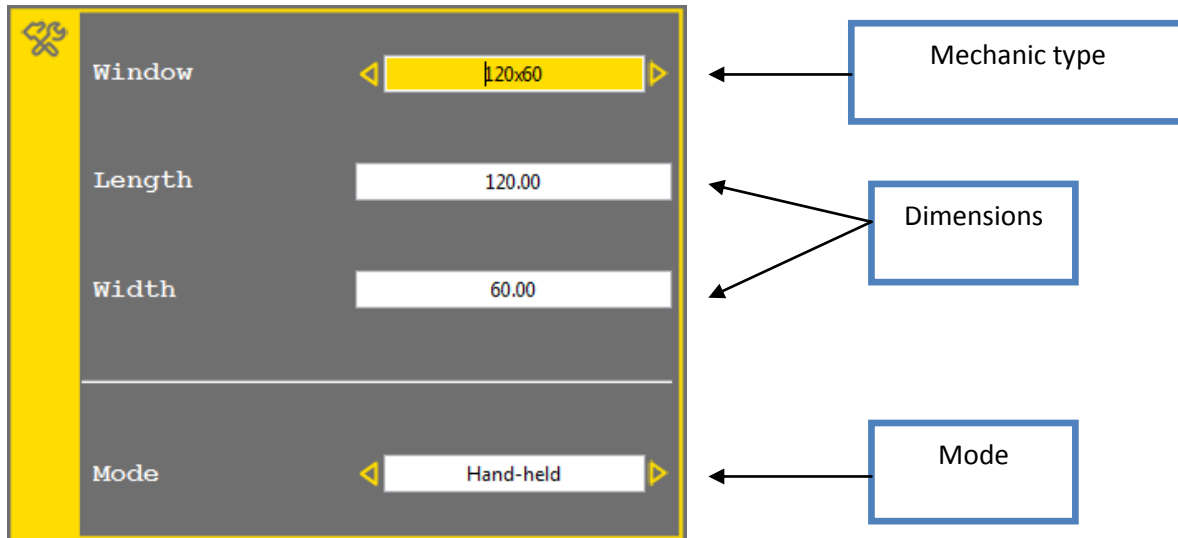
e) Machine Parameters:

Several adjustment and information relating to the marking machine are available with the following menu:





Window – Marking window configuration:

The marking window can be configured depending on the mechanics.



- Window: correspond to the actual mechanical window, depending on your mechanical type: 120x60, 50x60, 200x200, 200x60, v2 120x60, v2 50x60, v2 200x200, v2 200x60, Specific, Mini 60x30. Specific should only be used in case of a non standard mechanic and cannot be used with a Multi4 mini marking head.
- Length: correspond to the marking window length **really used**. It cannot be larger than the mechanical window length.
- Width: correspond to the marking window width **really used**. It cannot be larger than the mechanical window width.
- Mode : correspond to the used mode of the mechanics
 - Hand-held: default mode, the origin of the marking window is situated at the level of the origin position sensors.
 - Bench: in this mode the mechanics is virtually inverted. The window origin is virtually inverted compared to the default one

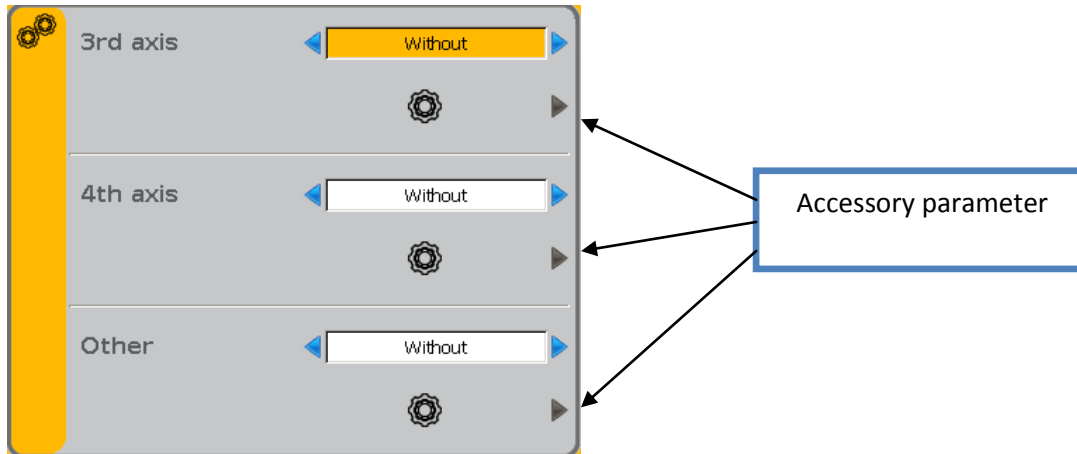
Use  to confirm your modifications.

Use  to cancel your modifications.

Accessories

Accessories allow the user associating secondary equipment to the marking machine.

Accessories are not compatible with Multi4 Mini marking head.





The navigation inside the window is done with the up and down position arrows. The right and left position arrows allow modifying the values.

- 3rd Axis: You can select (in the accessory list) the one connected to the third axis of your marking machine.
- 4th axis: If you have the fourth axis option, you can select in the accessory list the one connected to the fourth axis of your marking machine.
- Other : Allow to choose to use an accessory without additional axis

Accessories are configurable with Accessories Parameters, if they have been selected:

- *D Axis- D Axis Max*: you can modify Y offset of the D axis position. It corresponds to the D Axis position related to the marking window. More information in [D Axis](#)
- *Z Sensor and Z Electric*: You can modify the maximum course corresponding to the physical column dimension. More information in [Z Axis Sensor](#) or [Z Axis Electric](#)
- *Plate feeder*: You can redefine the marking, bolting and evacuation positions, depending on the plate type used. More info at [Plate feeder](#)
- Z Tor : No parameter

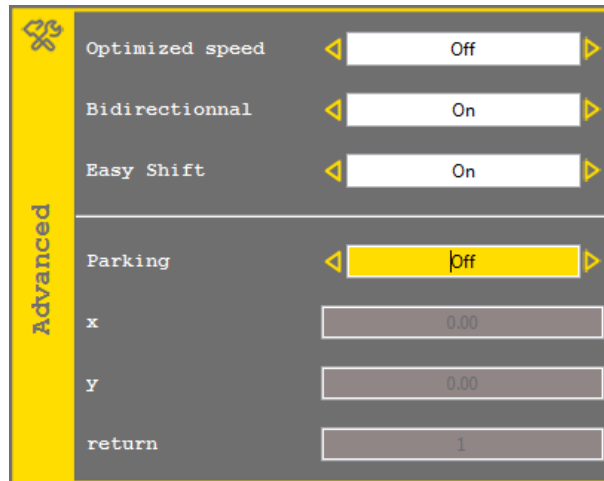
Use  to confirm your modifications or use  to cancel your modifications.



When confirming, the program restarts automatically to take the accessory modifications into account.



Advanced

Advanced allows the user to configure the marking machine advanced parameters with the following window:



Navigation inside the window is done with the up and down position arrows. The right and left position arrow allows modifying values.

- *Optimised speed*: allows selecting the speed at which the machine will go to the first marking point. It can be set to OFF, standard or high. If the value is OFF, The machine will go to the first marking point at the file programmed speed.
- *Bidirectional*: The bidirectional mode allows shortening marking times using the possibility of the machine to mark in one way or the other one.
 - Off : The machine marks each line from beginning to end of each line
 - On: The machine optimises the course and can be conducted to inverse the marking direction.
- *Easy shift*: Allows activating or deactivating of the easy-shift function. Easy-shift moves the marking head when you are [positioning the marking line](#)
- *Parking*: You can define a parking point for your marking head. If this option is “ON” the marking head will move to the X, Y position that you have defined at each end of marking using marking speed, instead of coming back to origin. The *return* parameter is specifying the number of marking after which the marking head will come back to origin, to avoid shifts in position (maximum 500). This option allows reducing cycle time, and/or clear up the zone under the machine.

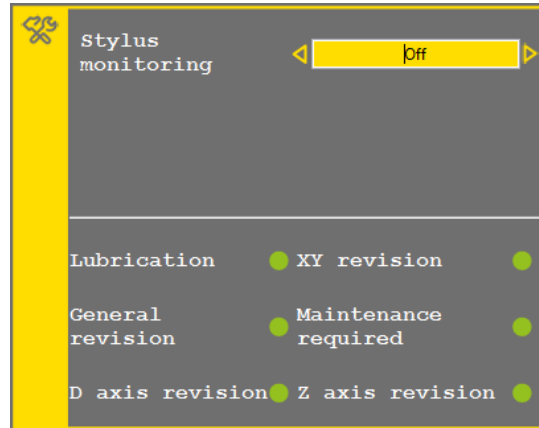
Use  to confirm your modifications or use  to cancel your modifications.

Maintenance



This icon appears on status bar when maintenance is needed

Maintenance allows the user to visualise several marking machine maintenance information





- *Stylus monitoring*: activate or deactivate the stylus monitoring.
By programming the height (distance) stylus-part to be marked for each marking file (see [marking parameters](#)) and a maximum drift not to be exceeded, the marking machine will analyse the results of the marking and memorise the computed values, when this mode is activated. If the programmed drift is exceeded, a warning is activated:
 - If card 8E/S is present, the output « Stylus fault” is activated, otherwise the standard output “Pause Machine” is activated.
 - The warning is stylus worn or head getting nearer depending on the direction of the drift
 - The machine will indicate a maximum number of possible characters before maintenance.

More, when the filling function is activated (see *TechnoProd* function) the minimum, maximum and average values, number of measurements and drift-type are recorded as well as others archives data.

This function is not available for a Multi4 Mini 60x30 marking head.

- *Lubrication*: The LED turns red if your machine requires lubrication. (every 500,000 impacts) . Once Stylus has been lubricated, press « 1 » on the keyboard to clear the warning.
- *XY revision*: The LED turns red if your machine requires servicing for the X and Y axis. (10,000 m covered)
- *General revision*: The LED turns red if your machine requires general maintenance. (the machine has been marking for 1000h)
- *Maintenance required*: The LED turns red if your machine requires a return to workshop (after one year of use.)
- *D Axis revision*: The LED turns red if your machine requires D Axis servicing. (20,000 turns completed)
- *Z Axis revision*: The LED turns red if your machine requires Z Axis servicing. (10,000 m covered)

Use  to confirm your modifications.

Use  to cancel your modifications.

Info



The information window displays several data linked to the machine:



The state of the different sensors is indicated by DEL's green or red depending on their state: activated or deactivated

1, 2, 3 and 4 keyboard keys are used to activate/deactivate the corresponding standard output.

1 to 8 key, in combination with *shift* key allows activate/deactivate the 8E/S card outputs.

Use  or  to close the window.



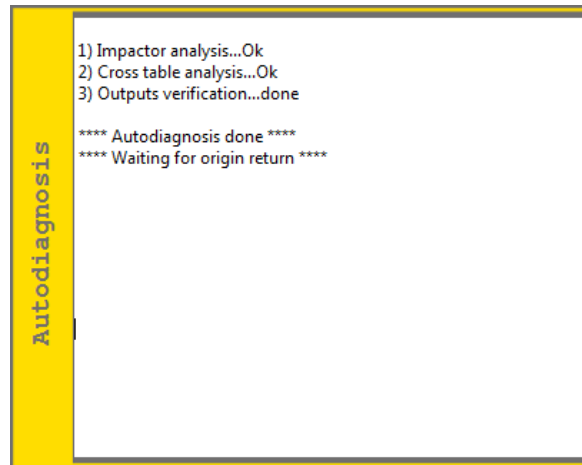
When the stylus is in origin position, origin sensors are displayed with a red LED. Indeed, at each origin return, the stylus is moved to sensor's detection limit. Thus, during origin return LEDs display consecutively red then green and finally red. To check if sensors are working, try to move smoothly by hand the solenoid block to X and Y home position.



Auto diagnosis

Auto diagnosis function will initiate several mechanical controls:

- Impactor analysis: make an impact and check that the current circuit is correct.
- Cross table analysis: check the origin detection and that there are no hard point along the mechanical axis.
- Third axis analysis (if present):
 - If D Axis: Command the D axis to rotate one way then the other way. The operator must check by himself the movement of the axis.
 - If Z Sensor Axis, Z electric or charger: check the origin detection and movements. The operator must check by himself that the movements are done
- Output verification: Commute the 4 output (1 to 4) one at the time. The operator should ear the relays changing state.

The progress of the auto diagnosis and the results are displayed in a window:



Use  or  to close the window

Communication

Communication parameters can be configured with this window





Navigation inside the window is done with up and down position arrows. Right and left position arrows allow modifying the values.

The TCP/IP part is displayed only if the controller has the Ethernet option.

If DHCP mode is activated, IP address is given by a server

If DHCP mode is deactivated you must enter manually the affected IP address and the subnet mask.

Control Box MAC adress is displayed in this window.

Use  to confirm your modifications or  to cancel your modifications.

Debug

You can access to the debug menu in the communication window with the following button:



This window allows seeing communication frames. For example sending a marking frame on the serial port "D" will show in the window the message "COM RS232 Frame : D". If the machine receives a wrong command an error appears with the ASCII code of the bad character.

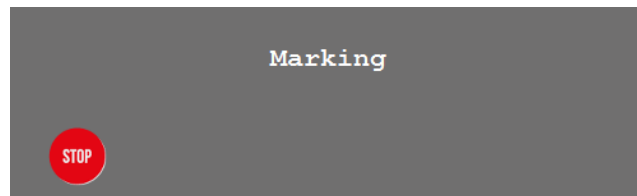
For example if you send the command "Z" on the serial port, the message will be "COM RS232 – Bad Char: 90".

H. Marking

Marking is started by pressing on the start key:



The following window opens during the time of marking.





A press on stop key:



will set the marking in pause :



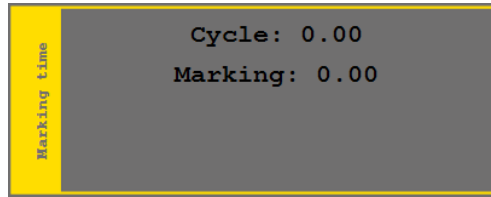
A second press  stops the marking and the machine is coming back to origin.

A press on:  restart the marking previously set in **pause**.



In Handheld mode, a long press on the trigger start the marking. A short press launches a [marking test](#).

The cycle time after marking is obtained using combined *Shift + Special characters keys*



5. Optional Accessory.

Optional equipment can be added to your marking machine.

A. Rotary D Axis

Rotary D axis allows marking on the circumference of cylindrical parts. Technomark offers two types of D axis: Standard D axis and heavy duty D axis. The way both of these products work is identical. The difference between the two mainly refers to their mechanical capability: weight and dimension of the parts.



D Axis must be positioned on the same side than the machine origin point. The window must be configured in [portable mode](#) to use this accessory.

To activate this option, select first this function as [accessory](#) by choosing the D Axis type.

D Axis can work in two ways:

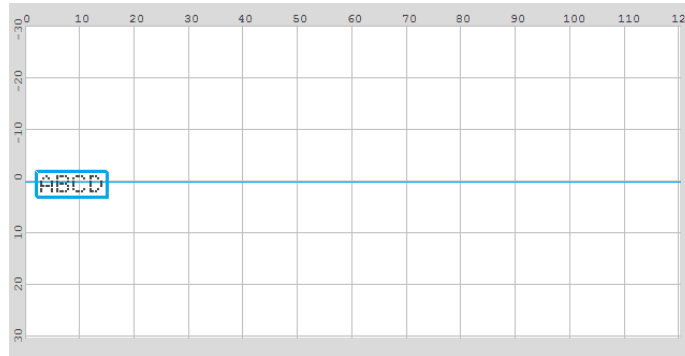
- **Circumference:** the marking is done on the part circumference. It is compulsory to enter the part to be marked diameter as the marking window will be adapted to the useful perimeter. The marking head moves simultaneously along the 3 axis and it is possible to realise a helicoidal marking on cylindrical parts.
- **Generator:** the marking is done in XY, so flat. Nevertheless, by inserting rotations (rotation function) in the marking file, D Axis will follow these rotations. So, in this mode, it is possible to mark hexagonal type parts.

To configure this mode with your marking file, see [marking parameters](#).



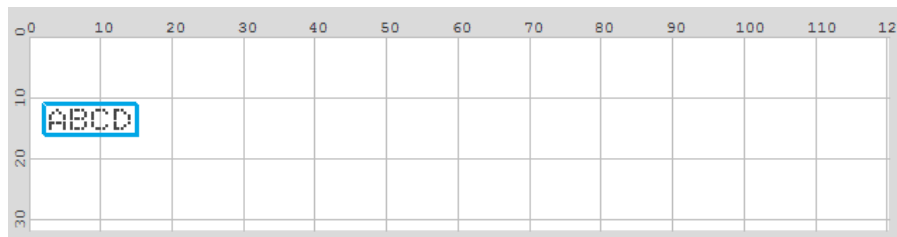
In the generator mode, the D axis rotation is done by inserting [rotation lines](#).

In that case the graphical view displays the generator at the offset defined for D axis (in [accessories](#)) with a blue line. :



The new marking lines are automatically centred on the generator. Nevertheless you can displace them in the usual way.

In *Circumference* mode, the view depends on the part to be marked diameter. If the circumference is less than the marking window, the view is reduced to the circumference development of the part to be marked.



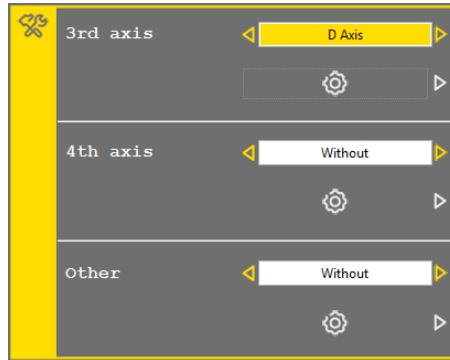
If the circumference is more than the marking window, the view is set at the marking window scale. You can then scroll the circumference using a combination *shift + position* arrow, up or down.



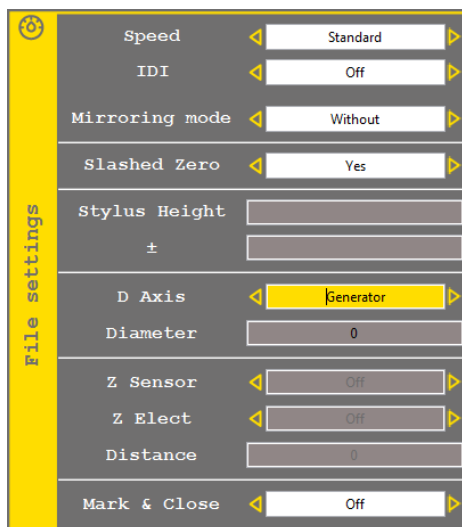
In circumference mode, even if the marking will be done on all the part circumference, the error *marking outside the window* could appear. You should then position properly your marking in the graphical view.

Circumference mode example

If not already done, first [associate the D axis accessory](#) depending on your model.

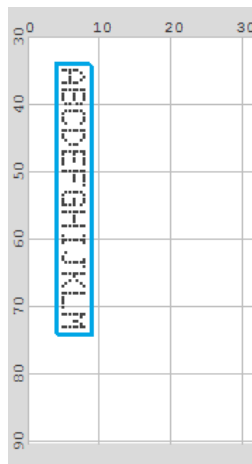


Create a [new marking file](#) and open the [marking parameters window](#)



Choose the *circumference* mode for the *D Axis* field, enter the marking part diameter in the *diameter* field, and then validate.

Enter your text lines. Use the [angle function](#) to mark on the circumference. Use the shift + up/down arrows to scroll the circumference in the graphical view.



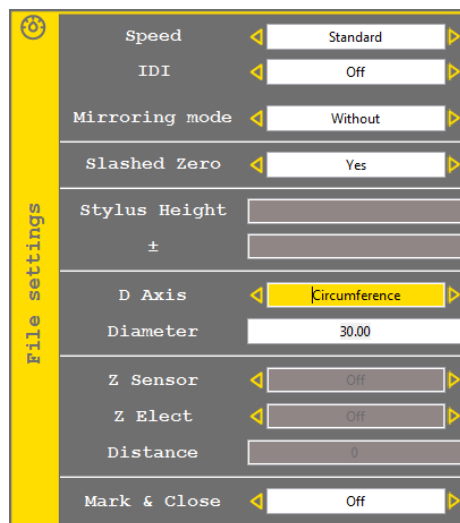
You are ready for marking.

Generator mode example

If not already done, first [associate the D axis accessory](#) depending on your model.

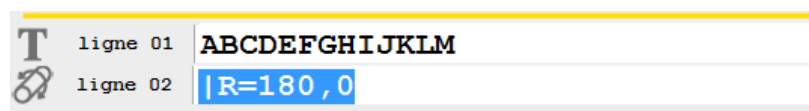


Create a [new marking file](#) and open the [marking parameters window](#)



Choose the *Generator* mode for the *D Axis* field then validate.

Enter a text line, insert a rotation in the next line. Enter a new text line.

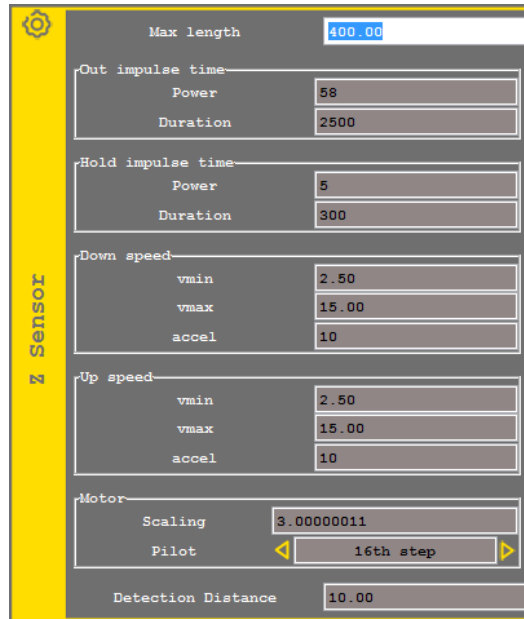


The first text will be marked without d axis movement, and then d axis will rotate the settled angle before the machine will mark the second text line.

B. Z Axis Sensor

Z axis *Sensor* is an **electrical column** on which the marking head is installed. It will position the stylus above the part at a **precise height** using a sensor feeling the part.

To use Z Axis sensor, you must first declare it as [accessory](#) of your marking machine. The maximum course can be modified with the configuring accessory window:



The Stylus-part distance is defined for each marking file using the [marking parameters](#).

When marking using Z sensor accessory, the marking head moves first along XY for the first marking point, then the column goes down to come and feel the part and position itself at the defined height.

During the marking you can define the upward movements of Z sensor (to avoid an obstacle for example) using function [Z sensor upwards](#)

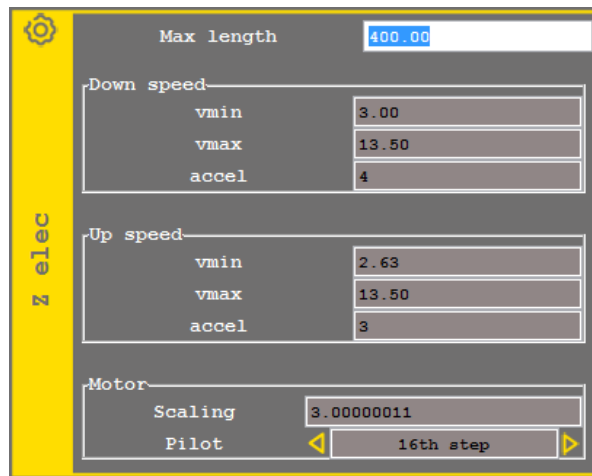
When the machine reaches a *Z sensor upward* line, the column will lift the marking head of the desired value.

Next line, the marking head moves first to the first marking point XY coordinates before the column lower the head to feel and position the stylus at the right height.

C. Electric Z Axis

Electric Z Axis is an **electrical column** on which is located the marking head. It will position the stylus above the part at a **given distance** with reference to the origin position of the column, value of the position course.

To use Electric Z Axis, you must first declare it as [accessory](#) of your marking machine. The maximum course can be modified with the configuring accessory window:



The distance is defined for each marking file using [marking parameters](#).

When marking using Electric Z accessory, the marking head moves first along XY for the first marking point, then the head goes down at the defined distance.

During the marking you can define the upward movements of Electric Z (to avoid an obstacle for example) using function [Electric Z upwards](#)

When the machine reaches an electric Z upward line, the column will lift the marking head of the desired value. If the entered value is negative, the head will go down.



Errors in defined values could damage the machine if it comes to hit the part or the base.



For operators' safety, make sure that nobody can put a part of his body between the stylus and the part to be marked during the down movement of the marking head. It is the user's responsibility to make sure the working set up is safe.

D. Z Tor Axis

Z Tor Axis is a function to **activate relays driving a pneumatic equipment bringing and taking away parts**.

For more information, consult your distributor.

E. Plate Feeder.

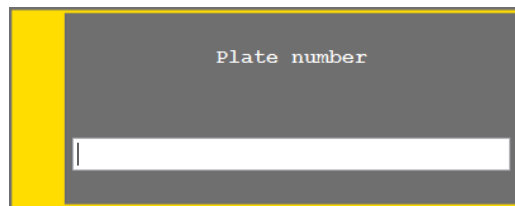
Plate feeder is an equipment allowing marking automatically plate series.


To use the plate feeder, you must first declare it as an [accessory](#) of your marking machine.

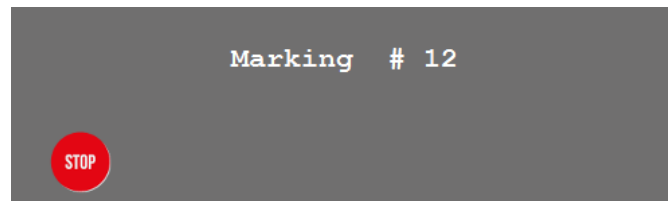
To realise marking of a plate serie, check first that the feeder has enough stock and press on Start :



A window opens to ask how many plates should be marked:



Enter the number of plates and confirm with  . The marking of the first plate is starting straight after confirmation. The marking window displays the number of plates left to be marked, including the current one.



The plates are taken one after each other to the marking position, held in place, marked, then put aside.

To stop series press two times on :  in the same way than to stop a [standard marking](#)

F. Battery (Optional):

Your MULTI4 equipment can use an optional **battery pack** allowing use without mains power supply.

TheMULTI4 marking equipment battery pack has a live expectancy of a minimum of 250 charge/discharge.

The battery pack (NimH) must be unplugged if you think it will not be used for more than a month.

It is necessary to make at least 4 or 5 charge/discharge cycles, to get the full use time of the accumulators.

The battery kit is protected against over heat (60°C) and short cuts.



Never plug/unplug the battery if the MULTI4 control panel is under power.

Before any replacement operation of the battery, disconnect the power plug and make sure the control panel is switched OFF.

There is an explosion risk if the battery is replaced by an incorrect type battery. Dispose of used batteries according to instruction.

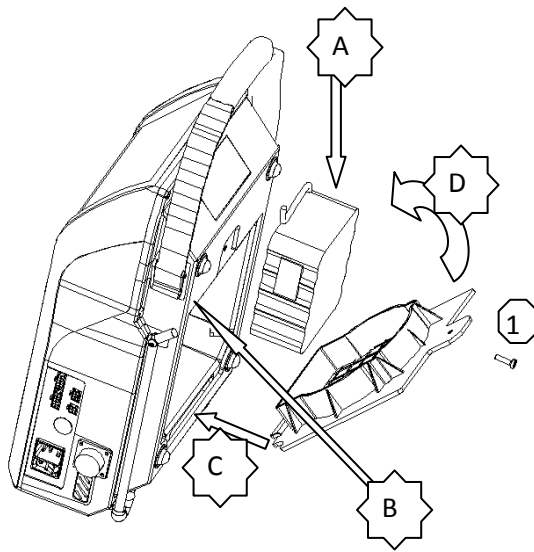


Never use a defective battery with your MULTI4.



Exclusively Technomark supplied batteries are compatible with your MULTI4

a) Installing or replacing the battery



To install the battery pack please follow the next steps:

- unscrew the M4 screw (rep 1)
- Remove the battery cover
- Keep the control at a vertical position
- Place the battery in the cover as show on the picture (A)
- Connect the battery to the connector inside the control box (B)
- Place one side of the cover in the locating on the control box (C)
- Slowly close the cover without hurting the wires between the cover and the control box (D)
- Screw the cover using the rep 1 screw


b) Operating

MULTI4 is charging the battery when the machine is connected to the mains power and ON, the charging function of the control box is automatically charging your battery whatever it's level of charging and is trickling it as soon as the battery is full. We offer as well a specific external charger.

If you work on mains and wish to toggle to battery supply without shutting off the machine, commute the power switch to 0. A window will appear asking if the user wishes to shut down the machine or not.

If you answer yes the machine shuts down. If the answer is no or no answer after 2 seconds, the machine toggles to battery mode.

The charge mode is fully automatic. The battery will charge as soon as needed. The charge is completed in 2:30 h

The battery key  allows to switch off the machine when it is working in battery mode, or to switch on if needed.

When in battery mode, LED:  will flash every two second.



After charge, internal control box temperature can be high. Let the temperature fall before starting new marking. In fact, a heavy duty of the marking machine using the battery will increase the battery temperature and make the control box under temperature security.



In average or high sleep mode, the battery does not recharge.

Information about battery state is available through icons in the status bar

- No battery detected
- battery full
- battery middle
- battery empty
- battery charging empty
- battery charging middle
- battery charging full

c) External Charger (Optional)

The external charger characteristics are:

- Power supply : 110-115 V AC or 220-240 V AC
- Usable temperature : 32°F to 115°F (0°C to 45 °C)
- Quick charge current : 1 A

The quick charge time is around 2:30h. There are 2 indicator lights on the charger, showing when the charger is under tension (LED AC On) and when the battery is fully loaded (Charge OFF)

As soon as the CHARGE OFF Light is on your battery is ready for use.

G. Carte 8E/S (Optional)

An additional card is available as an option to use additional inputs/outputs.

See *Interfacing instruction for Multi4 Control Unit* dedicated document for more information.

H. Ethernet Card (Optional)

Your MULTI4 marking equipment can receive an optional Ethernet card allowing to connect the marking machine to the client internal net (straight cable) or directly to a PC (crossed cable). Ideally, connect your control box on your company network (switch, hub ...).

See *Interfacing instruction for Multi4 Control Unit* dedicated document for more information.

6. Use of Inputs/outputs and RS232 communication

Your MULTI 4 controller is equipped as standard with 3inputs/4outputs connector and RS232 serial port.

See *Interfacing instruction for Multi4 Control Unit* dedicated document for more information.

7. Maintenance and everyday care



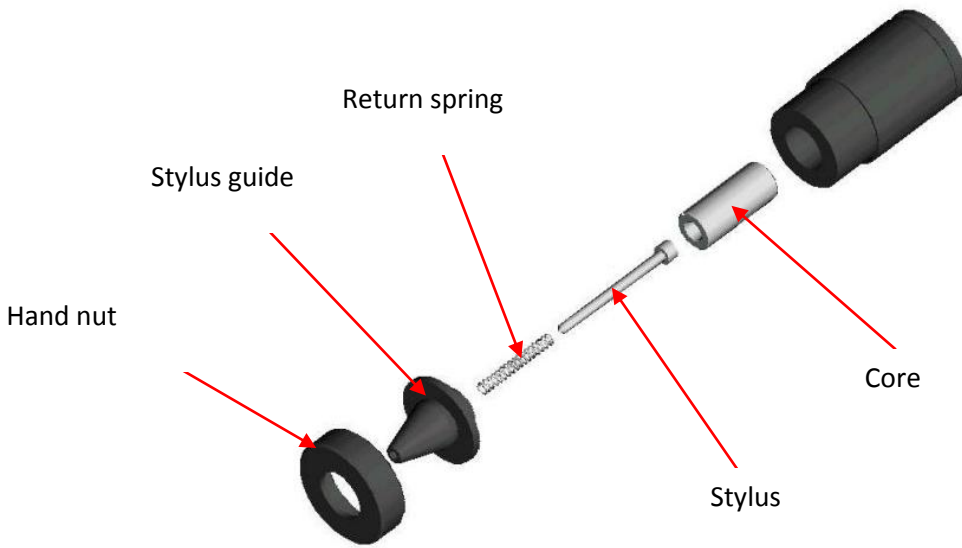
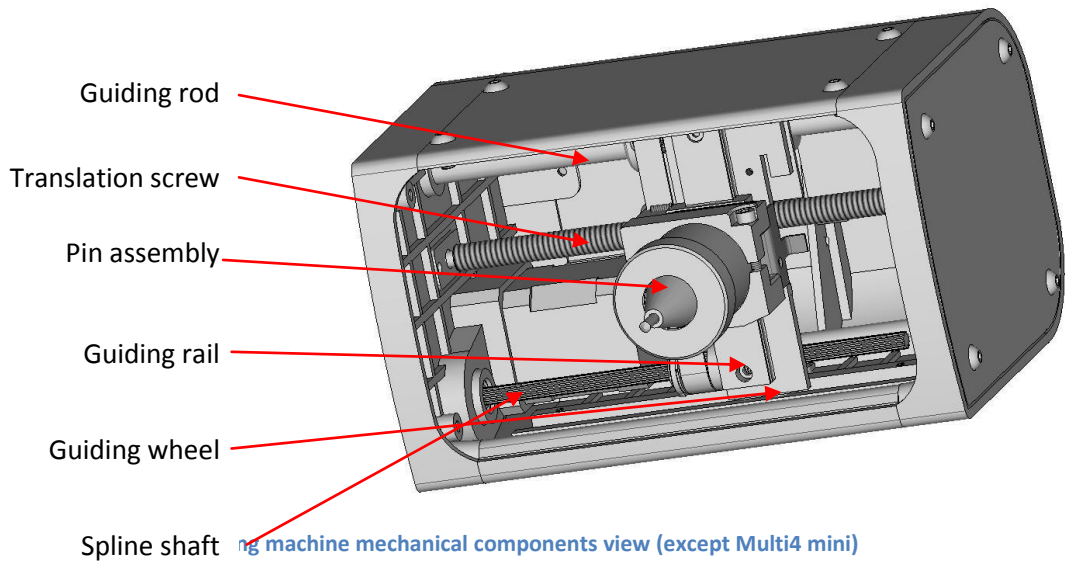
Maintenance and service operations must be done with the machine out of power.

The power cable must be unplugged. If you have an optional battery, the battery must be disconnected too.

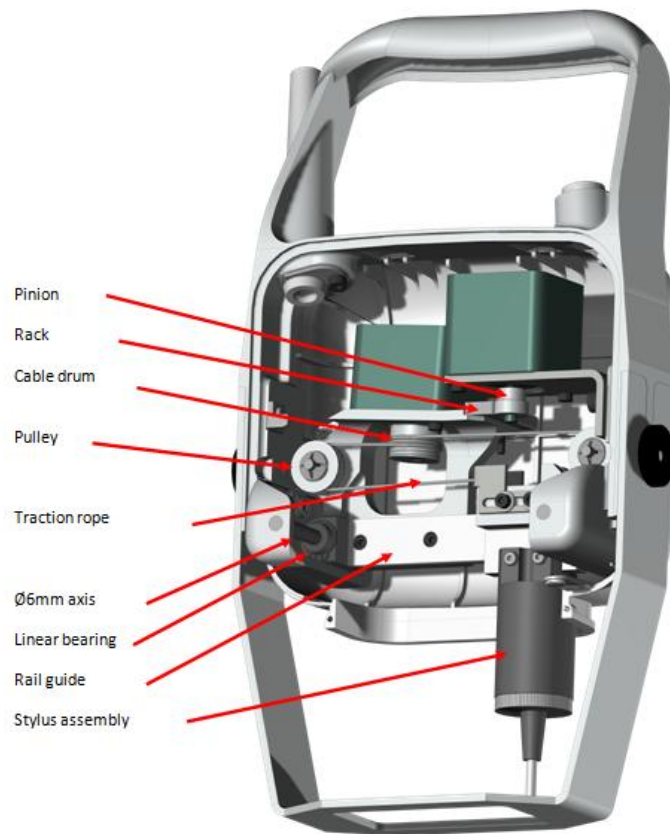
A. Identification of mechanical components



1 General view of the marking machine



3 Stylus assembly open view



4 machine mechanical components view for Multi4 mini

B. General maintenance informations

The maintenance operations of your Technomark equipment are **limited**.

The active part requiring the most care is the stylus assembly. It is absolutely necessary to lubricate the stylus to avoid that it gets stuck inside its guide.

In case of accumulation of dust, metal parts...the stylus position can show some **hard points** affecting the **marking quality**.

The lubrication frequency is variable, depending on the conditions of use of your machine.

Environment, number of marking, matrix, hitting force are all parameters affecting the maintenance frequency.

As an indicator, we recommend (for a 5 x7 matrix):

- Very intensive use (+ de 10 000 characters/day) : daily
- Intensive use (4000 characters/day) : twice a week
- Moderate use (1000 characters/day) : Once a week

C. Stylus cleaning and lubricating

- Make sure the power is off
- Position the machine sideways (stylus in horizontal position) or up on the column at the highest (top) position.
- Unscrew the nut by hand. Never use a tool.



Using a tool as a universal spanner for example can definitely damage your machine.

- Pull out the guide, the return spring, the stylus and the core.
- Clean as necessary the core, the stylus and the guide, using a dry, clean rag.
- Use Vaseline oil from your maintenance kit: pour a little bit of fine oil inside the guide and on the stylus.
- Put back together the parts, in the order and in the way shown on the stylus assembly open view.
- Tighten manually the nut onto the electric coil without force (see the warnings and usage precautions)

D. Stylus sharpening

The stylus is a wearing part of the Technomark machine.

Repetitive markings (especially on hard materials) will blunt the pin. So the quality of the impact dots (circularity, depth) is decreasing with time;

Alternatively, a lateral shock on hard material can nick the tip and produce a bad quality marking.

All styluses supplied with your Technomark machine (standard or optional) are made of one piece carbide tungsten. So a sharpening operation is possible, as long you use an appropriate grind.

Tip angles:

The standard styluses are sharpened with a 90° tip. This angle is the best for optimised marking quality/life time. Nevertheless we offer different sharpening angles for specific applications: (60°, 120°, Aeronautic with a 0,2mm round tip).

Check first the sharpening angle of your stylus before starting any sharpening operation.



The stylus can turn freely inside its guide. So a non-concentric sharpening will always result in bad quality marking.

E. Return spring

The spring is a wearing part of the Technomark machine

The action of the spring is essential in the marking quality. A “lazy” spring will not allow the stylus to come back up fast enough, and the dots could be weak, or not regularly spaced. If you get this problem, change the spring.

Proceed in the same manner than for a lubrication operation to disassemble the stylus assembly.

The life time of the spring depends on the stylus position, the vibration frequency and the operation temperature of the stylus assembly.



Free length of the spring: 53.5 mm.

It is admitted that the spring should be considered as “tired” when its length is less than 51 mm

F. General mechanical maintenance

When proceeding with this type of operation, make sure to disconnect your controller to avoid any movement from the mechanic parts.

As for the pin assembly, the other mechanical parts require minor maintenance. Nevertheless we recommend:

- Keep as clean as possible the guiding rod to optimise the life span of your marking equipment, and to maintain its marking quality.

To do so, turn down the machine so the stylus is facing you, and using a dry rag and/or a degreasing solution, clean the guiding rods on all their length.

- Make sure as well that all the components shown on the “marking machine mechanical components view” are kept as clean as possible.

To do so, turn down the machine so the stylus is facing you, and wipe the dirty parts with a **dry rag**. You can as well use a “dry compressed air gun” to do this cleaning.

Once clean, it is advisable to lubricate all rolling parts with the Vaseline oil available in your **maintenance kit**. It will help to remove the recalcitrant dust parts at the first movements of the mechanic parts as well as make the mechanical movements smoother.



Spline shaft and its bushing must not be lubricated with vaselin oil. Use of this oil, could tamper the spline shaft’s self-lubricating coating.



Due to machine use, black dust coming from the spline shaft may appear on close components. This is not a sign of dysfunction or defect.

The cleaning frequency depends directly on the usage conditions of the machine. A visual control will be sufficient to detect quickly any scrub marks on the guide

As a guide

- Tough environment use : Once a week
- Normal environment use: Once a month
- Clean environment use: Twice a year

G. Maintenance of the electronic panel-marking controller

No specific maintenance is necessary. Just make sure not to use the controller in a confined place. The **natural air flow** will be enough to cool down the controller. See chapter “use conditions”

The electronic panel contain power components, so it produces heat. It is normal that your keyboard gets warm during intensive use.


The panel is temperature regulated: in case of very intensive use, in hot ambient temperature, near the maximum allowed value, a message can appear on the screen. In case of excessive temperature which could damage your equipment, it could stop working ; wait until it cools down before being able to work again.

The only maintenance to be recommended is to pass a clean dry rag from time to time, to keep the best possible usage.

H. Error code and trouble shooting.

The Technomark machine will help you to detect any malfunction that could happen. If a problem is detected, error codes can appear on the screen.



The window will close with 

Please refer to the following table to identify your problem:

Error code / Problem	Probable reason	Corrective Action
<u>Error 1</u> : Memory error		Restart the controller If still at fault, call After Sales Service
<u>Error 2</u> : File error		1- Restart the controller 2-Recreate the file following the method described at§5-G-d And delete the defective file

		3- Contact After Sales Service
<u>Error 8</u> : Short circuit stylus	<p>The pin assembly cable is cut or damaged</p> <p>The connector of the pin assembly is not plugged properly, or damaged</p> <p>The marking head cable is cut or damaged</p>	<p>Check the pin assembly cable condition and restart the controller</p> <p>Check the connector of the pin assembly cable and restart the controller</p> <p>Check the marking head cable condition, and restart the controller</p> <p>If still at fault, call After Sales Service</p>
<u>Error 9</u> : Open circuit	<p>The pin assembly cable is cut or damaged</p> <p>The connector of the pin assembly is not plugged properly, or damaged</p> <p>The marking head cable is cut or damaged</p>	<p>Check the pin assembly cable condition and restart the controller</p> <p>Check the connector of the pin assembly cable and restart the controller</p> <p>Check the marking head cable condition and restart the controller</p> <p>Contact After Sales Service</p>
<u>Error 10</u> : weak current	<p>The pin assembly cable is cut or damaged</p> <p>The connector of the pin assembly is not plugged properly, or damaged</p>	<p>Check the pin assembly cable condition and restart the controller</p> <p>Check the pin assembly cable connector and restart the controller</p> <p>If still at fault, call After Sales Service</p>
<u>Error 13</u> : Missing marking head	The marking cable is not correctly connected to the controller	Check that the marking head is correctly connected and the connector locked then restart

<p>Can happen only during marking controller initialisation</p>	<p>The marking head cable is cut</p> <p>A mechanical blockage prevents the machine to go to its origin point</p> <p>The detection card is faulty</p>	<p>the controller</p> <p>Check the cable condition</p> <p>Check that the path of the marking head is free then restart the controller</p> <p>With no power on, check that the machine can reach its origin position freely</p> <p>If still at fault, call After Sales Service</p>
<p><u>Error 14</u> : Origin X and Y error</p> <p>Can happen only after a first or n marking</p>	<p>The pin assembly is mechanically stopped by an outside obstacle</p> <p>The detection elements are faulty</p> <p>The detection card is faulty</p>	<p>Check that the path of the marking head is free then restart the controller</p> <p>Check that the detection tabs are not bent, and so not passing inside the detectors and restart the controller</p> <p>Contact After Sales Service</p>
<p><u>Error 15</u> : Origin X error</p> <p>Can happen when starting, after the first marking or after n markings</p>	<p>The pin assembly is mechanically stopped by an outside obstacle</p> <p>X detection element is faulty</p> <p>The detection card is faulty</p>	<p>Check that the path of the marking head is free then restart the controller</p> <p>Check that the X detection tab is not bent, and so not passing inside the detector and restart the controller</p> <p>Contact After Sales Service</p>

<p><u>Error 16</u> : Origin Y error</p> <p>Can happen when starting, after the first marking or after n markings</p>	<p>The pin assembly is mechanically stopped by an outside obstacle</p> <p>Y detection element is faulty</p> <p>The detection card is faulty</p>	<p>Check that the path of the marking head is free then restart the controller</p> <p>Check that the Y detection tab is not bent, and so not passing inside the detector and restart the controller</p> <p>Contact After Sales Service</p>
<p><u>Error 17</u> : Origin Z Sensor error</p>	<p>No Z Sensor Axis</p> <p>The Z sensor origin detection element is faulty</p>	<p>Configure your marking machine without Z Sensor</p> <p>Contact After Sales Service</p>
<p><u>Error 18</u> : Origin Z electric error</p>	<p>NO Z Electric</p> <p>The Z electric origin detection element is faulty</p>	<p>Configure your marking machine without Z Electric axis</p> <p>Contact After Sales Service</p>
<p><u>Error 19</u> : Plate charger origin error</p>	<p>No plate charger</p> <p>The plate charger origin detection element is faulty</p>	<p>Configure your marking machine without plate charger</p> <p>Contact After Sales Service</p>
<p><u>Error 20</u> : Tor Z origin error</p>	<p>No Z Tor</p> <p>The Tor z origin detection element is faulty</p>	<p>Configure your marking machine without Tor Z</p> <p>Contact After Sales Service</p>
<p><u>Error 21</u>: D axis origin error</p>	<p>No D axis</p> <p>The D axis origin detection element is faulty</p>	<p>Configure your marking machine without D axis</p> <p>Contact After Sales Service</p>
<p><u>Error 23</u> : Z sensor error :</p>	<p>The Z sensor detector has covered its full course without</p>	<p>Configure again Z Sensor</p>

Maximum course reached	touching a part	
<u>Error 24, 25, 26, 27, 28, 29, 30</u> : Z sensor Error	An error happened while driving Z sensor axis	Restart the controller Contact After Sales Service.
<u>Error 31</u> : Plate detection error	No plate detected on the plate charger	Load the plate charger Contact After Sales Service.
<u>Error 32</u> : Stuck plate error	A plate is stuck in the plate charger	Remove the stuck plate
<u>Error 33</u> : Loading plate error	Loading of a plate is too long	Contact After Sales Service
<u>Error 34</u> : Discharging plate error	Discharging of a plate is too long	Contact After Sales Service
<u>Error 39, 40, 41, 42</u> : EEPROM error		Contact After Sales Service
<u>Error 43,44,45,46</u> : USB key error	The USB key in use is faulty Internal controller fault	Try a different USB key Restart the controller Contact After Sales Service.
<u>Error 47</u> : Internal error		Restart the controller Contact After Sales Service
<u>Error 48</u> : Demo error	The demonstration date is passed	Contact the marketing department
<u>Error 49</u> : Window error	A marking point is outside the marking window	Check if there is a warning flag showing a marking outside the marking window in the marking view. Reposition the text. If still a problem, call After Sales Service
<u>Error 50</u> : Temperature error	The machine stayed too long in easy shift mode, the motors stayed too long under power	Stop the controller for about 10 minutes then start again If still a problem, call After

	<p>The ambient temperature is outside specifications (110°C for motor drivers, 90°C for power supply drivers)</p> <p>Marking in a row many files with big number of characters and using a high quality matrix</p>	<p>Sales Service</p> <p>Stop the controller for about 10 minutes then start again</p> <p>If still a problem, call After Sales Service</p> <p>Decrease the number of dots by using a different font.</p> <p>Reduce the marking speed</p> <p>Reduce the marking strength</p> <p>If still a problem, call After Sales Service</p>
<u>Error 56</u> : Unknown error		<p>Restart the controller</p> <p>Contact After Sales Service.</p>
<u>Error 57</u> : Datamatrix license error	The datamatrix license missing	<p>Delete datamatrix in the marking file</p> <p>Fill the datamatrix license number in the license menu</p>
<u>Error 58</u> : Logo license error	The logo license missing	<p>Delete logos in the marking file</p> <p>Fill the logo license number in the license menu</p>
<u>Error 68</u> : Variable empty error	A forced variable isn't filled	Fill forced variables before starting the marking
<u>Error 69</u> : Low battery error	The battery is almost empty	Charge the battery
The controller screen does not work	The controller is not powered up	<p>Check that the power cable is properly connected</p> <p>Check the on/off switch position</p> <p>Eventually call After Sales Service</p>

<p>The marking depth is not sufficient and/or not regular</p>	<p>The stylus tip is worn or damaged</p> <p>The stylus is dirty and/or partially stuck</p> <p>The spring is worn/ too weak</p> <p>The distance Stylus/part to be marked is nearly 10 mm and irregularity of the part causes the stylus to reach its stop limit</p>	<p>Re sharpen or replace stylus</p> <p>Clean and lubricate stylus</p> <p>Change the return spring</p> <p>Move the head nearer to the part</p> <p>Eventually call After Sales Service</p>
<p>No impact is done when marking</p>	<p>It is a test marking and not a marking cycle</p> <p>The stylus is blocked and/or is not going down/or up</p>	<p>In handheld operation a short press on the trigger start a test, a long one a cycle start.</p> <p>Clean the stylus, check the spring and if the core is present. Hand tight the nut</p>
<p>The machine is making unusual noises</p>	<p>The driving systems and/or guides are too dirty</p>	<p>Clean the mechanical parts following the user's manual guidelines</p> <p>If problem not solved call After Sales Service</p>
<p>Marking quality is not satisfactory and/or characters are not well drawn</p>	<p>The part to be marked is not well blocked or the machine is not well maintained on the part</p> <p>The marking speed is too high for the character size</p> <p>The impact depth is too much for the character size and the matrix used</p>	<p>Fix/bolt the part or keep firmly the machine on a face as straight as possible on the part to be marked</p> <p>Reduce the marking speed, increase the character size</p> <p>Decrease the marking strength, use a less precise matrix, increase the character size or move the machine closer to the part.</p>

8. Compliance statement

Déclaration de conformité."CE" (originale)
European Community "ECC" compliance statement (original)

Le constructeur soussigné:
The undersigned manufacturer:



TECHNOMARK SAS
1 Allée du développement
42350 LA TALAUDIÈRE
FRANCE

Déclare que la machine de marquage neuve décrite par les éléments suivants:
Declare that the following new machine described by the following elements:

Machine de marquage modulaire Modèle MULTI4 constitué des deux éléments MULTI4 V3-
MULTI4 (50-120-200-200XL)
Modular marking machine Model MULTI4 made up with two elements MULTI4 V3- MUTI4 (50-120-
200-200XL)

Est conforme aux dispositions des directives Européennes suivantes:
Is in conformity with the following European Directive

2006/42/EEC	Directive Européenne Machine / Machinery
2014/30/UE	Directive Européenne Compatibilité Electromagnétique / Electromagnetic compatibility Environnement industriel / Industrial environment
2002/95/EC	« RoHS » Restriction of Hazardous Substances

Et que les normes et/ou spécifications techniques mentionnées ci-après ont été appliquées:
And the standards and/or technical specifications mentioned below were applied:

NF EN 61000-6-2:2005	EN 60950-1:2005	EN 12100:2010
NF-EN 61000-6-4:2007	EN 60950-2:2005	

Sous réserve d'une utilisation conforme à sa destination, aux spécifications et instructions du constructeur et d'une installation conforme aux normes en vigueur et aux recommandations du fabricant
A condition is that it is used in the manner for with it is attended and in accordance with the specifications and instructions of the assembler, it is also required to conform to the existing standards.

La société TECHNOMARK SAS est habilitée à constituer le dossier technique
TECHNOMARK SAS company is allowed to build the technical file.

La machine est également compatible avec les normes et/ou spécifications suivantes:
The machine is also compliant with following standards and/or specifications
FCC Chapter 15

A Saint-Chamond
Le 05/07/2017


Laurent BAUD
Président