Operation manual

PinMark

UMC 112

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Chapter 1

Safety

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1 For your safety

The UMC 112 coining or engraving unit has been developed as the newest, state-of-the-art marking system concerning safety and reliability.

We confirm that the UMC 112 marking system meets the fundamental safety and health requirements of the EEC machine guideline 98/37/EG. We provide the "EEC conformity explanation", and the CE-indication on the marking system.

The type plate is together with the CE-indication behind the front door of the UMC 112, and on the back of the UMC 112.

We, as manufacturers of the marking system, want to make you, as operators, completely familiar with the UMC 112 marking system. An extensive chapter has been devoted to all the safety concepts of the marking system, and refers to possible dangers and measures to take.

Note
Consideration must be taken into account that generally accepted safety rules, and rules for the prevention of accidents goes beyond these references.

2 Definitions

Danger area ... is the range in the periphery of the marking system, in which safety or the health of a person is endangered by the stay in this range.

User ... is the person, in whose working area the marking system is set up and operated.

Operator/ Personnel ... are the persons, who are responsible for transport, list, start-up, enterprise, maintenance including cleaning and repair of the marking system.

3 Operational safety

The marking system is built according to the latest state-of-the-art technology, and reliability in service.

From this marking system, however, dangers can proceed if it is used by untrained personnel inappropriately, or to not intended use. This can result in:

- Dangers for the safety of the operator.
- Impairment of the marking system and further real values of the user.
- Impairment of the efficient work of the marking system.

3.1 Intended use of the marking system

The UMC 112 coining or engraving unit is a marking system for marking products through coining.

Intended use means in addition:

- The setting up conditions prescribed by the manufacturer must be kept and maintenance work must be accomplished.
- The installation of the marking system and its operation must stand in conformity with the valid national regulations of the user country. For their observance the user is responsible.

Impermissible is:

- Arbitrary changing or changes of the marking system by the user or operator.
- Each function, which could impair safety.

We assume no liability from not intended use!
Each use going beyond that is not considered as intended. For material damage and personal injuries resulting from this, the manufacturer is not responsible; the risk for this carries alone to the user.

3.2 Measures taken by the user/operator

Consider warning plates and references

Within operation and handling of the marking system, dangers can arise if not handled with proper care. In this manual, operating instructions are given, including appropriate warning references in the front. In addition, warning plates can be found on the marking system.

Note
Mind the warning references!

Mind the commands and interdictions of the warning references. They serve for your protection.

These warning references include:

- A symbol.
- References to the source and the kind of the danger.
- Instructions, how you can avoid the danger.

Example:

Heavy soiling impairs the marking system!

Marking system does not work efficiently any more.

➢ With heavily soiled ambient air use bellows (option) as cover.

➢ Maintain marking system regularly.

Personnel instruction

The marking system may be served, waited and repaired only by authorized, trained and instructed personnel.

Work on the electrical and pneumatic equipment may be implemented only by specially trained specialists.

In addition, the following measures must be taken before the personnel begins the work of using the marking system:

- Instructs over arising dangers.
- The user must obligate, to the extent necessary, the personnel for carrying protective clothing and gloves.
- Competencies for operation, maintenance and repair must be clearly specified, so that under the aspect of safety no unclear authority arises.
- Read the technical documentation of the marking system. It is recommended to the user to be confirmed in writing in each case that the personnel has read and understood the technical documentation.

Duty to care in handling the marking system

Guarantee perfect condition of the installation:

- The user and/or the circle of acquaintances assigned by him may operate the marking system exclusively in the perfect condition.
- The user must ensure cleanliness and clarity of the work place at the marking system by appropriate instructions and controls.
- The user must provide for sufficient circulation of fresh air in the work spaces.
- The operator must announce occurring changes (including the operational behaviour) of the marking system which impair safety, immediately to the user. In addition, the marking system must be examined at least once per shift for outwardly recognizable lack and damage.

With all work that concern transport, installation, start-up, operation, maintenance and repair, the prescribed switching-off procedures must be kept:

- With any adjustments, maintenance or repairs, the marking system must always be switched off over the MAIN SWITCH. Exceptions to it, with which the marking system must remain switched on with appropriate work, are noted in the manual in each case.
- With work on pneumatics:
  - Turn off and lock the compressed air supply.
  - Wait at least 5 s after turning off the compressed air supply, until the pressure diminishes itself.
  - Examine whether the operating pressure dropped on 0 bar. Read off the current operating pressure from the appropriate manometer.

Use of intended spare parts and operational funds

Original parts and accessories are particularly designed and manufactured for the marking system. Spare parts to use as original parts and accessories, which are not supplied by the manufacturer of the marking system, are not examined and approved by the manufacturer. The installation and/or the use of such products can possibly change the constructionally given characteristics of the marking system and endanger safety.

Note
For damage which results from the use of non-original parts and accessories and/or inadequate installation or exchange of original parts and accessories, the manufacturer assumes absolutely no liability or responsibility.

When using the intended operational funds, the instructions for use must be kept. As far as a safety data sheet (European guideline 91/155/EWG) of the manufacturer for operational funds is prescribed, the references made there must be considered obligatorily, like e. g.:

- Chemical characterization.
- Physical and safety-relevant data.
- Transport.
- Regulations.
- Safety measures, Storage and Handling.
- Measures to be taken in case of fire and accidents.
- Toxicological information.
- Ecological information.

This applies in particular to the adequate disposal of operational funds. For this the safety data sheet indicates the prescribed kind of disposal and the waste key. The safety data sheet can be requested with the manufacturer of the operational funds.

3.3 Measures taken by the manufacturer

All marking systems are series equipped, complete with all necessary safety devices. During operation all safety rules and rules for the prevention of accidents must be kept.

Movable, sharp-edged parts!

Risk of injury.

- ➢ Do not reach into the marking head during the marking.
- ➢ Do not reach into the traversing range of the marking tool during the marking.

Coining When coining, the carbide point of the marking tool is brought to oscillating by compressed air. Then the carbide point is moved. The stroke of the marking tools is approx. 1 - 5 mm. Therefore reaching into the danger area is only possible with difficulty. Due to the low force, with which the carbide point oscillates, heavy injuries of the operator are to be excluded.

Engraving In contrast, when engraving a diamond point is pressed onto the workpiece by compressed air and then is moved. The stroke of the marking tool is max. 10 mm. Therefore reaching into the danger area is only possible with difficulty. The forces are as low as when coining, so that the operator can't be injured heavily.

4 Dangers overview

The following chart outlines potential hazardous risks and endangerment to one's life from the marking system. Through construction and design, as well as implementation of safety devices as defined by the EEC machine guideline 98/37/EG, will prevent dangers and promote safety to personnel. If the user of the marking system can provide additional measures for the prevention of dangers, the user finds these additional measures in the following chart.

Type of endangerment	Spot of endangerment	Danger	Additional measure
Mechanical endangerment • By squeezing	• Marking tool • Marking head	Risk of injury Risk of injury	Do not reach into the danger area.
• By cutting and chopping off	• Marking tool • Marking head	Risk of injury Risk of injury	Do not reach into the danger area.
Electrical endangerment • By electrical contact	• Directly with parts that are normally under voltage. • Indirectly with parts that are under voltage in failure.	Danger of life Danger of life	- -
Endangerment caused by breakdown or failure • Failure in power supply	• Drives • Control voltage	Risk of injury Risk of injury	- -

Tab. 1

Chapter 2

Set-up

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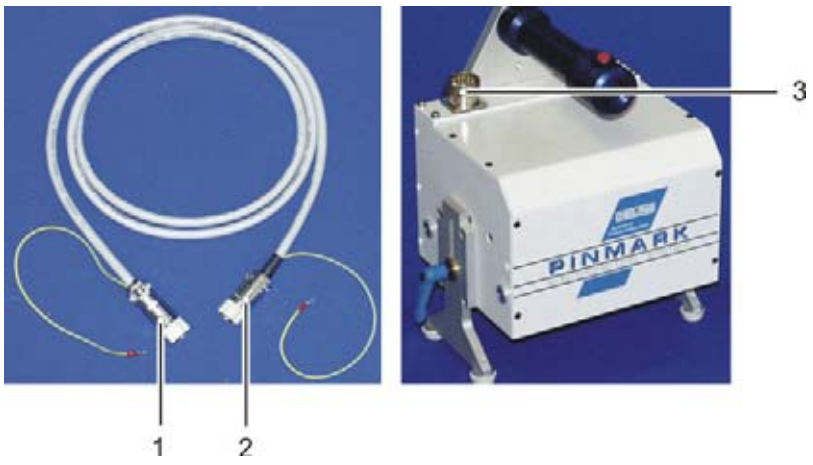
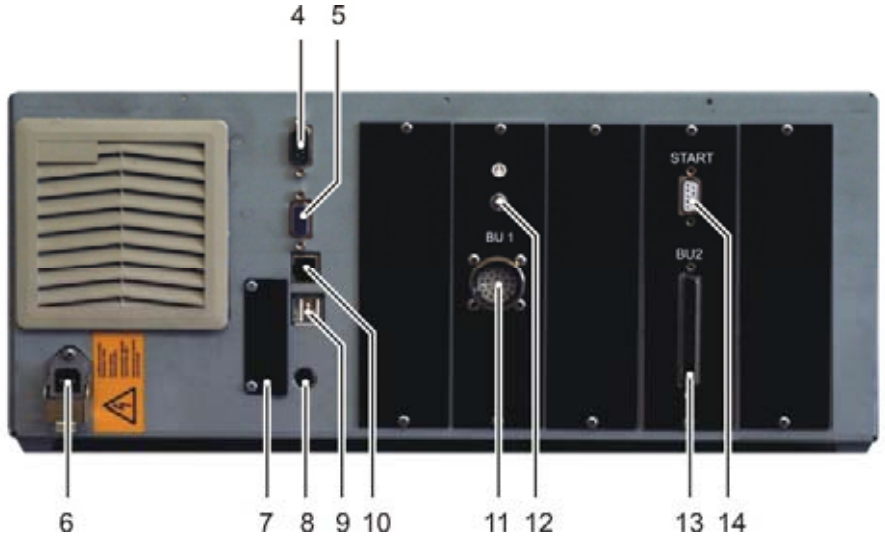
1 Installation and Set-up of the Marking System

1. Install the marking system in compliance with all safety rules.
2. Supply the marking head with oiled and cleaned compressed air via the designated connection.



1	26-pin plug of the connection cable	3	21-pin plug at the marking head
2	21-pin socket of the connection cable		

Connection cable for marking head and control Fig. 10372



4	Serial port RS232	10	Network interface
5	Socket VGA	11	26-pin socket BU1
6	Plug line cord	12	Grounding screw
7	Slot Compact Flash-card	13	Socket BU2
8	Socket PS/2	14	Serial port START
9	2 USB sockets		

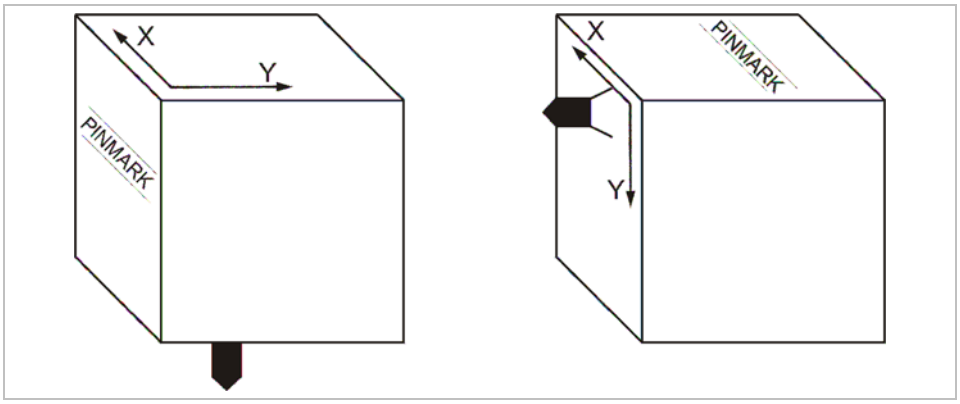
Back side of the control UMC 112 Fig. 10636

3. Tuck the 21-pin socket of the connection cable (2) into the 21-pin plug (3) at the marking head. Ensure the coding pin of the socket is inserted into the flute of the plug.
4. To screw the socket: turn the outer ring of the plug clockwise.
5. Fix the grounding wire of the connection cable under a screw of the housing of the marking head.
6. Tuck the 26-pin plug of the connection cable (1) into the 26-pin socket BU1 (10) on the back side of the control UMC 112. Ensure the coding pin of the plug is inserted into the flute of the socket.
7. To screw the plug: turn the outer ring of the plug clockwise.
8. Fix the grounding wire of the connection cable with the grounding screw (12).
9. Connect keyboard to the socket PS/2 (8) or to a USB socket (9).
10. Connect mouse to the socket PS/2 (8) or to a USB socket (9).

    Note
    Behind the front door of the control UMC 112, there are 2 additional USB sockets. You can connect the keyboard/mouse also into these sockets.

11. If desired attach foot switch to the serial port START (14).
12. If the control UMC 112 has to communicate with other computers via the captive network: connect network cable to the network interface (10). A DHCP-server must be installed in the captive network.
13. Connect the control to the supply voltage (115/230 V, 50/ 60 Hz) via the line cord (6).
14. Open the front door of the control.
    The MAIN SWITCH is behind the front door.
15. Switch on the control via MAIN SWITCH.

1.1 Built-in units



Horizontal (on the left) and vertical installation of the marking head Fig. 10262

All marking heads are supplied ready for use. The following points must be considered when installing the marking head into a production line:

- Built-in units must be installed adjustable to allow subsequent aligning and/or exact adjusting of the distance tool tip - workpiece.
- Use a bellows (option) as cover if the unit is operated in a heavily soiled working environment. This cover can be used only with horizontal installation of the unit.

Marking head 5 / 9 with coining tool WE2 and bellows (option) Fig. 10276

With vertical/lateral installation of the marking head, (front of the marking head shows upward) the following points must be additionally considered:

- Marking tool can move down by itself, since the driving motors are dead after switching off the marking equipment and possess no automatic locking.
- Bellows (option) cannot be used.
- The y
- Y-axis is the axis with the shorter traverse path. The marking head may be inserted only with perpendicular Y-axis (see Fig. 10262, page 2-4).

2 Measures to prevent electronic interference

The following general references secure a trouble-free operation of an electrical system:

- Take the main power supply directly from the switch cabinet feed.
- Signal cables must not be laid together with cables carrying power.
- Signal cables may not be laid with cables from units that would cause interference (e. g. contactors, power motors). Otherwise use shielded mains cable and ground the shielding at one end. The same applies for the auxiliary power supply for controllers and isolating amplifiers.
- Sources of severe interference such as contactors and motors should be suppressed with RC components. Within the switch units only use switching equipment and other devices that have been suppressed by RC combinations, for example. It is necessary to note the standard codes of practice for electrical work (VDE, DIN and the corresponding EN).

2.1 Complying with interference suppression as per CE

The marking system UMC 112, coining or engraving unit, is designed and built according to the regulations of the electromagnetic compatibility guideline. To ensure interference suppression the following points must be considered:

- Use shielded control cables to connect all external components (e. g. marking head, foot switch, signal inputs and outputs) to the connection BU2 (DB37) at the control UMC 112. At the back of the control the shielding of all the cables must be connected at the controller end to the grounding screw (9, Fig. 10563, page 2-2) via a cable that must be kept as short as possible.
- The grounding screw of the control UMC 112 must be connected to the system ground (at the power supply feed) via a separate grounding cable. When integrating the control into a more sophisticated production line the grounding screw must be connected with the central ground supply point of the line via a separate grounding cable. The cross-section of the cable should be at least 2.5 mm^2.
- Length connection cable control - marking head max. 5 m.
- Cable foot switch two-core with shielding, a two-pole jack plug made of plastic must be used.
- Length cable foot switch max. 3 m.
- Lay the connection cable control - marking head and the cable foot switch separately from any possible sources of interference (see also paragraph 2).
- The following should be noted when connecting external components to the control UMC box:
  - The components used (e. g. monitor, printer) must likewise comply with the CE standards for industrial use.
  - Length connection cable control - external component max. 2 m. Shielded cables and plugs with metal housings must be used.
  - If connections to or from the serial port (RS232) cause functional errors, change over from this type of connection to one that is not subject to interference (e. g. RS485, fibre optic connection, galvanic separation through an opto-electronic coupler).

Chapter 3

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1 Short description

The UMC 112, coining or engraving unit, is a marking system for marking products through coining or engraving.

Coining When coining, the marking takes place via a carbide point which is brought to oscillating by compressed air. The carbide point is moved in X- and Y-direction by a coordinate unit with two stepping motors. Thus, material in the workpiece is compressed and/or displaced. In continuous operation, the marking consists of a dense sequence of individual points which results in a closed line.

Engraving When engraving, a diamond point is pressed on the workpiece by compressed air and then moved into X- and Y-direction over the workpiece by a coordinate unit with two stepping motors. A cutting treatment of workpieces takes place. The engraving speed is a little bit lower than the coining speed.

With an engraving unit, you can also coin after making a change of the needle system.

2 Technical data

2.1 Marking units

		Coining unit	Engraving unit
Resolution	[mm]	standard 0.1	
Coining frequency	[Hz]	oscillating freely approx. 200 or controlled 20 - 150	-
Marking speed	[characters/s]	1 - 5	1 - 3
Compressed air	[bar]	max. 6	max. 4
Electricity, voltage	[V]	115 or 230	
Net frequency	[Hz]	60 or 50	

Tab. 1

2.2 Control UMC 112

Computer	Embedded PC with operating system Linux	
	Clock frequency [MHz]	400
	RAM [MB]	128
	Ports	2 serial, 1 parallel, 4 USB 1.1, net work
Memory	Compact Flash-card with 256 MB for data and operating system hard disk optional	
Motor control	ÖSTLING 2 axis motor electronics, max. phase current 2 A optionally 4 axis	
Outputs	8 digital outputs for standard signals, 24 V, max. 0.5 A optionally up to 32 digital outputs	
Inputs	8 digital inputs for standard signals optionally up to 32 digital inputs	
Display	SVGA colour display (800 x 600 Pixel, 65K colours)	
Keyboard	Integrated keypad with 8 keys standard PC keyboard (via PS/2 or USB)	
Dimensions	Width [mm]	441
	Depth [mm]	342 (+75 for connection and cable)
	Height [mm]	183
Weight	[kg]	10.5
Electricity	Voltage [V]	100 - 240
	Net frequency [Hz]	50 - 60
	Power input [W]	max. 120
Temperature range	0 °C - 45 °C, non condensing	
Protection class	IP54	

Tab. 2

2.3 Software

Mask	Max. 31 text fields with up to 50 characters each or one graphic	
Font	15 fonts (see chapter 4)	
Character height	[mm]	0.5 - 99.9
Character width	width factor	0.1 - 10
Character spacing	[mm]	0 - 10
Character direction	horizontal, vertical, at any angle on any arc, clockwise or anti-clockwise	
Special characters	Import of HPGL plotting files (*.plt)	
Additional functions	Counter, date and time, query of text (also with bar code reader) before each marking, shift index	

Tab. 3

3 Description of the components

3.1 Marking unit

Unit design

4 different unit designs are available:

- Table unit.
- Hand-held unit.
- Built-in unit.
- Combination unit (combination of table unit and hand-held unit).

Customized special designs are also possible.

Table unit With the table unit the marking head is attached to a stand. The marking head can be manually moved up and down (Z-axis).

Table unit Fig. 10244

Hand-held unit With the hand-held unit, the marking head is put on the workpiece manually with a handle or a double handle. At the handle there is a releasing pushbutton for the start of the marking.

Built-in unit The built-in unit corresponds to the table device without stand. It is intended for the installation into production and assembly lines.

Combination unit The combination unit is a combination of table unit and hand-held unit. Depending upon intended purpose, the marking head can be fastened to the stand or be removed and used as hand-held unit, e. g. for the marking of larger workpieces.

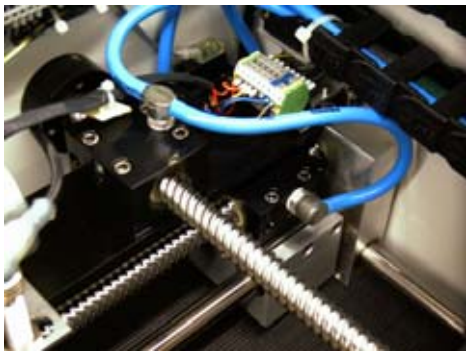
Marking heads

The different marking heads differ in:

- Type of drive:
  - Coining heads.
  - Engraving heads.
- Size of the marking field: from 30 x 50 mm up to 150 x 300 mm.

Coining heads are equipped with a toothed belt drive. Engraving heads are equipped with a spindle drive because when moving an engraving tool, larger forces are needed than when moving a coining tool.

Toothed belt drive



Spindle drive

Coining and engraving head without cover Fig. 10301, 10190

All marking heads have 2 linear axes by default. As special design also marking heads with only one linear axis and one external rotation axis are available.

Option: 3 axes

Likewise as special design, marking heads with 3 axes are available (2 linear axes and one external rotation axis or 3 linear axes).

Flat and round workpieces can be processed with marking heads with rotation axis. Generally, only 2 axes are active during a marking. Before the marking you must specify if the second linear axis or the rotation axis is the Y-axis.

With marking heads with 3 linear axes, the height adjustment of the marking head to the workpiece is done electrically via the Z-axis (third axis).

Option: 4 axes

Optionally, additionally, 4 axes can be used. Either through the use of 2 marking heads or through one marking head with Z-axis and rotation axis.

With the use of 2 marking heads, you have to select the active marking head before a marking. This is done via the software or optionally via a PLC (see chapter 6). Both marking heads can also be used simultaneously and can mark different text fields at the same time.

With marking heads with Z-axis and rotation axis, the height adjustment of the marking head to the workpiece is done electrically. Everything else is equivalent to the marking with 3 axes (see above).

Marking speed

The marking speed of 1 - 100 mm/s is entered via the software. The marking speed has a substantial influence on the quality of the marking result: the lower the marking speed, the more evenly the marking.

During high marking speed the quality of the marking result does not only diminish, but also step error arises by the mass inertia of the marking head. The maximum marking speed depends therefore on the assigned marking head and its maintenance. Bad maintenance decreases the maximum marking speed (for maintenance see chapter 5).

Marking speeds over 80 mm/s produce nearly always insufficient marking results. Marking speeds that are inherently dangerous to the marking head or other parts of the marking systems will generate an error.

Combination unit with marking head

Not every marking head is available in every unit design:

Designation marking head	Size of the marking field [mm]	Table unit	Hand-held unit	Built-in unit	Combination unit
3 / 5	30 x 50	C	C	C	C
4 / 6	40 x 60	E	-	C / E	-
5 / 10	50 x 100	C	C	C	C
8 / 14	80 x 140	C / E	C	C / E	C
15 / 20	150 x 200	E	-	E	-
15 / 30	150 x 300	E	-	E	-

C: Coining unit
E: Engraving unit
-: not available

Tab. 4

3.2 Marking tools

2 different types of marking tool can be used:

- Coining tool.
- Engraving tool.

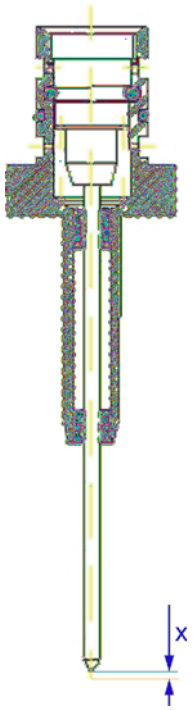
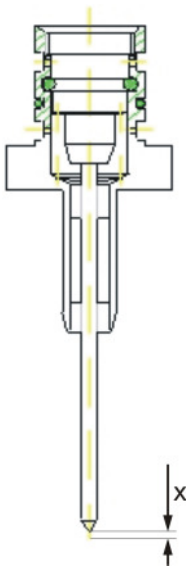
Coining tool The carbide point of the coining tool is brought to oscillating by compressed air. The marking image (text, graphic) is coined into the workpiece as a dense sequence of individual points. Thus material in the workpiece is displaced.

Engraving tool The engraving tool, equipped with a diamond point, is pressed on the workpiece by compressed air and then moved over the workpiece. A cutting treatment of workpieces takes place.

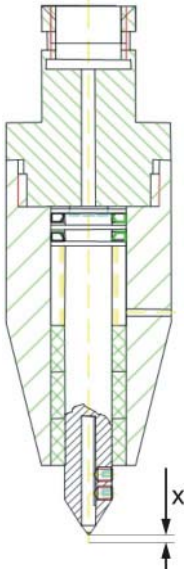
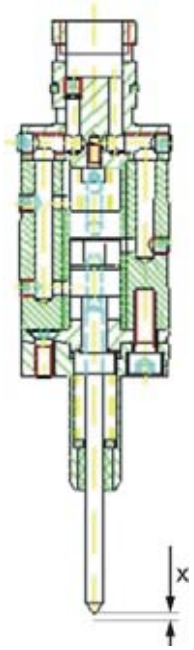
Engraving tools can be operated only with engraving units (see tab. 4).

Examples for marking tools

Note
Not all marking tools can be used in each marking head. There are different sizes of tool fittings.

Coining tool WE 2 **Art.-Nr. 45.22.0000**		**Coining tool WE 3** **Art.-Nr. 45.30.0000**	
	• Blue housing The needle tip is brought to independent swinging by compressed air. The frequency amounts to approx. 200 Hz (depending on the pressure and work distance x). Thus material in the workpiece is compressed and/or displaced. This coining tool is characterised by a high needle frequency and is therefore suitable for nearly all applications. Even the smallest markings are producible trouble-free.		• Red housing The needle tip is brought to independent swinging by compressed air. The frequency amounts to approx. 200 Hz (depending on the pressure and work distance x). Thus material in the workpiece is compressed and/or displaced. This coining tool is characterised by a high needle frequency and is therefore suitable for nearly all applications. Even the smallest markings are producible trouble-free.
	Application: • Applicable in the coining heads 4 / 6, 5 / 10, 8 / 14 and all engraving heads. • Work distance x = 1 - 3 mm. • Working pressure: 3 - 6 bar.		Application: • Applicable in the coining heads 3 / 5. • Work distance x = 1 - 3 mm. • Working pressure: 3 - 6 bar.

Tab. 5

Engraving tool WE 1 R **Art.-Nr. 45.40.0000**		**Deep coining tool WE 1 and WE 4** **Art.-Nr. 45.10.0000**	
	The diamond point is pressed on the workpiece by compressed air. When moving the engraving tool, the marking image (text, graphic) is engraved into the workpiece. The engraving speed is a little bit lower than the coining speed		• Black housing The needle tip is brought to independent swinging by compressed air. The frequency amounts to approx. 150 Hz (depending on the pressure and work distance x). Thus material in the workpiece is compressed and/or displaced. This coining tool is characterised by a large stroke and diameter. It is suitable in particular for deep markings.
	Application: • Applicable in all engraving heads. • Work distance x = 0 - 8 mm. • Working pressure: 2 - 4 bar.		Application: • Applicable in the coining heads 5 / 10, 8 / 14 and all engraving heads. • Work distance x = 3 - 5 mm. • Working pressure: 4 - 6 bar.

Tab. 6

3.3 Control UMC 112

All units of the PinMark family can be controlled by the control UMC 112.

External devices can communicate with the control over the RS232 port. In addition the control and thus the entire marking system can be controlled from external. For this purpose digital inputs and outputs are present.

Software The software of the control unit offers true WYSIWYG ("what you see is what you get"): the display shows an exact preview of the marking result on the workpiece.

Both writings and graphics (format * plt) can be imported by the software and marked thereby. The software contains by default several character sets including their special characters and umlauts. All characters can be aligned and arranged freely, the arrangement on a circular arc is likewise possible.

Wildcards or objects can be used in marking. E. g. the current date, time or serial number - all of which increases automatically after each marking. Also variable data, which will be entered directly before the marking by the user, can be used. And all this without changing the marking sample each time.

For more information about the software see chapter 4.

Chapter 4

Operation

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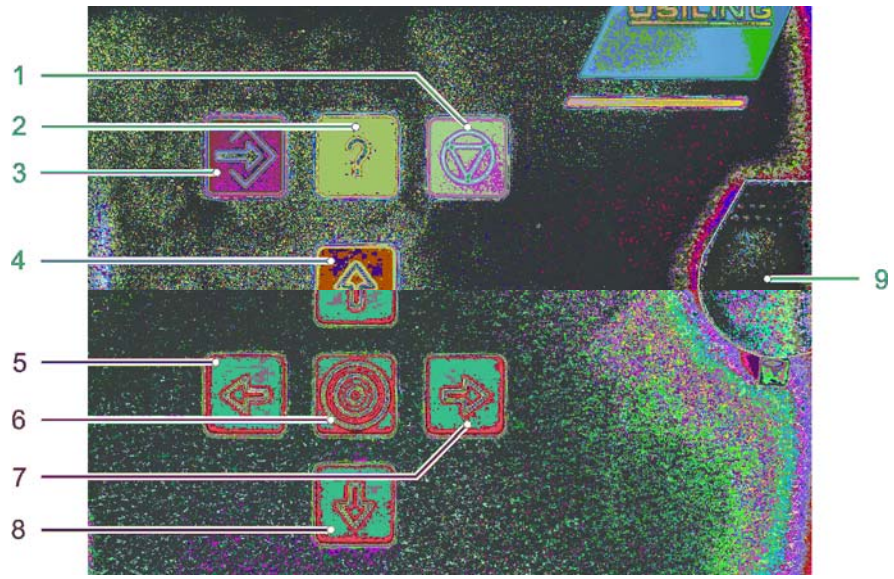
1 Operating devices

The following operating devices are available at the UMC 112:

- Front door with keypad.
- Standard PC keyboard.

1.1 Front door with keypad

At the front of the control are the display and the front door with keypad:



1	ESC: abort, back to the superior menu	5	BACK-TAB: change in the prior field
2	HELP: run the online help	6	is equivalent to <F2>
3	ENTER: acknowledgement	7	TAB: change in the next field
4	PFEIL: cursor to the top	8	PFEIL: cursor to the bottom
		9	Cover lock in front door

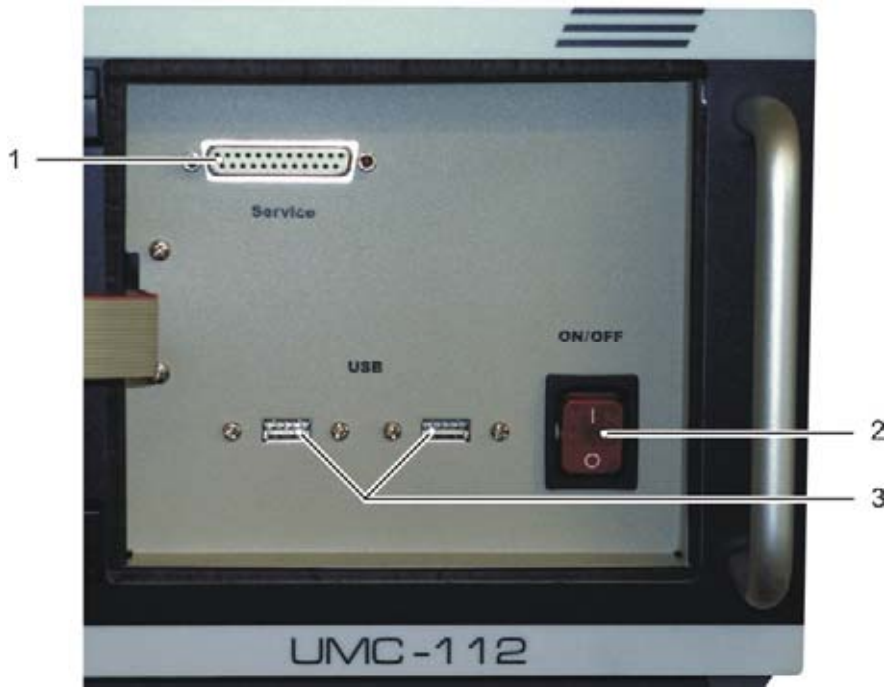
Keypad on front door Fig. 10245

The software is designed in such a way that from switching on the control up to the start of marking you can always press ENTER on the keypad in order to confirm the next step. Therefore, a marking can be started without connected PC keyboard.

➢ To open the front door: open the cover of the lock (9) and unlock the lock.

The following operating devices are behind the front door:

- MAIN SWITCH.
- Sockets USB.



1	Parallel socket (only for ÖSTLING service technicians)	2	MAIN SWITCH
		3	2 sockets USB

Opened front door Fig. 10246

1.2 Standard PC keyboard

Each marking equipment has several keyboard connections that can be used alternatively:

- Keyboard connections at the back of the equipment (PS/2 and USB).
- Sockets USB (3, Fig. 10246) behind the front door of the equipment.

2 Basics of operation

Online help The control UMC 112 has an online help. For (nearly) each page that is shown on the display there is a help page.

1. To run the online help: press <F10>.
2. To quit the online help:
   - Press <Q>.
   - Press ENTER.

2.1 Text fields, Masks and Projects

The software is based on the use of text fields and masks. Several text fields which belong to one workpiece are combined in a mask. A mask can contain max. 31 text fields. A text field can contain max. 50 characters or one graphic.

If more than 31 text fields are needed for the marking of a workpiece, several masks must be created. If a text field shall contain more than 50 characters, its content must be divided on 2 text fields. However, only one mask can be loaded and marked.

A mask can be stored also in a project. Beside the mask with all text fields a project contains also all other current adjustments on the control e. g. used marking head.

Example A mask e. g. corresponds to a type plate, the text fields correspond to the individual fields of the type plate like year of manufacture, serial number, etc.

The arrangement of a text field within the mask is determined by the X- and Y-coordinates of the text field. The origin of the coordinate system lies in the lower left corner of the marking area.

2.2 Switching on and off the control

Switching on the control

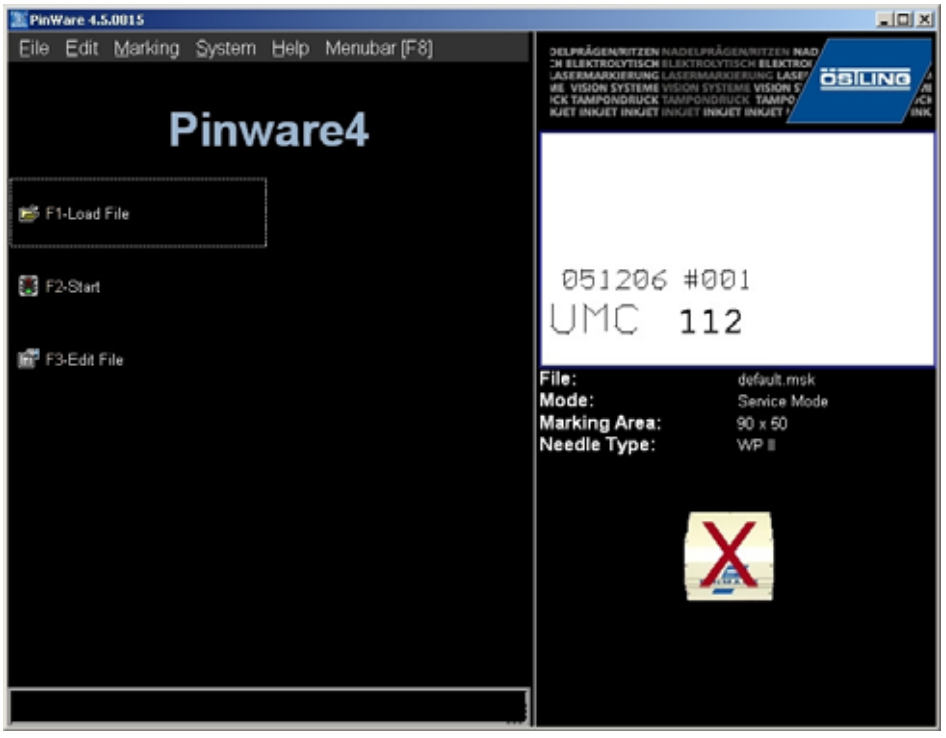
Safe operation not warranted!

➢ Control must be switched off for at least 20 s before switching on.

1. Open the front door.
2. Switch on the MAIN SWITCH.

Control boots, axes of the marking head reference: the slide of the marking head moves in X- and Y-direction until the X- and Y-initiator respectively actuates. Then it continues to move in X- and Y-direction by the value of "Overtravel" (see page 4-36). The reached position is defined as basing point of the marking head. This basing point is the origin of the marking field.

After successful homing the main menu appears:



Main menu Fig. 10561en

Switching off the control

1. Save all changes of the current mask or project (see pages 4-21 and 4-22).
2. Open the front door.
3. After no keys is pressed for a short time: switch off MAIN SWITCH.

2.3 Brief instruction: marking a workpiece

1. Switch on the control via MAIN SWITCH.
2. Select *Load file*.
3. Select the desired file.
4. Select .
5. If visible/switched on: enter the number of workpieces to be marked behind "Number".
6. Select to start the marking. To mark another workpiece: select again.

3 Working with masks

3.1 Creating a text field

Several text fields which belong to one workpiece are combined in a mask. A mask can contain max. 31 text fields. If more than 31 text fields are needed for the marking of a workpiece, several masks must be created.

Type text field 5 different types of text field are available:

- Text: text is aligned on a straight line.
- Circular text: text is aligned on the inside or outside of a circle.
- HPGL file: insert a graphic file in the format *.plt.
- DataMatrix Symbol: insert data matrix.
- Position: insert empty text field at a defined position.

Alignment Depending on the type of the text field different alignments are available. For the types "Text", "HPGL file" and "DataMatrix Symbol":

- Bottom left: the reference point of the text field lies in the lower left corner of the text field.
- Bottom centre: the reference point of the text field lies in the lower centre of the text field.
- Bottom right: the reference point of the text field is in the lower right corner of the text field.
- Mirrored bottom left (only for type "Text"): the reference point lies in the lower left corner of the text field; the text is displayed in mirror writing.

The following alignments are available for the type "Circular text":

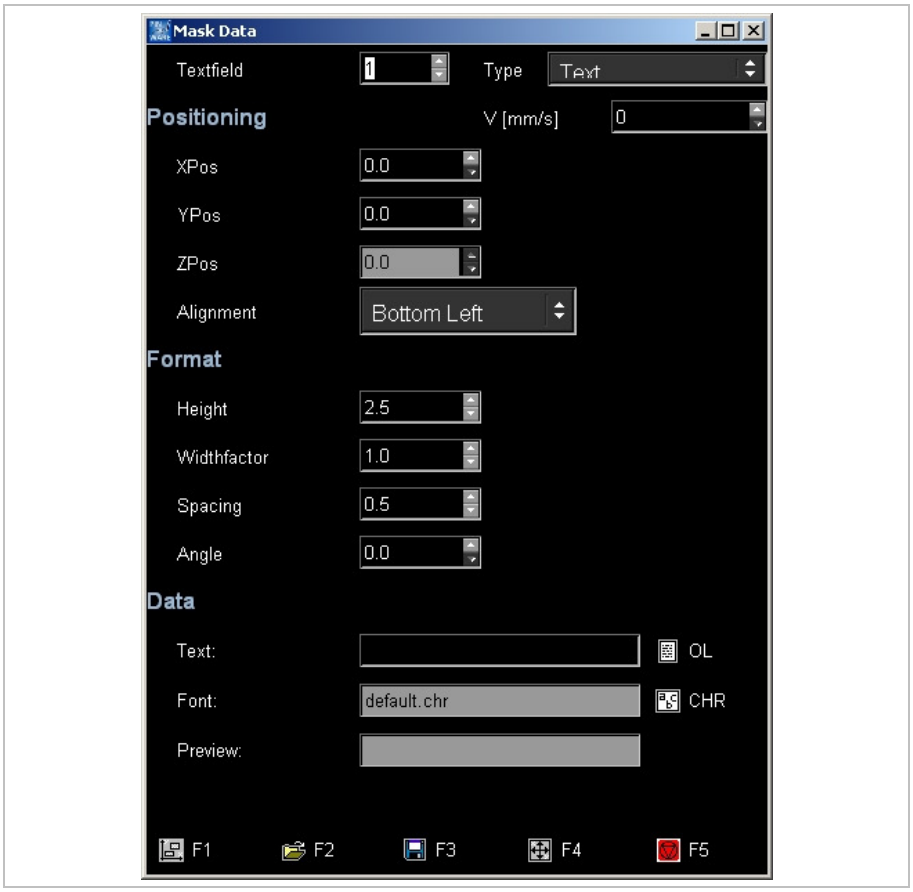
- Circle I left: the lower edge of the text is put on the inside off the circular arc; the text is aligned in the clockwise direction on the circular arc. The beginning of the text lies on the reference point.
- Circle I centre: the lower edge of the text is put on the inside off the circular arc; the text is aligned in the clockwise direction on the circular arc. The centre of the text lies on the reference point.
- Circle I right: the lower edge of the text is put on the inside off the circular arc; the text is aligned in the clockwise direction on the circular arc. The end of the text lies on the reference point.
- Circle O left: the lower edge of the text is put on the outside off the circular arc; the text is aligned in the anti-clockwise direction on the circular arc. The beginning of the text lies on the reference point.

- Circle O centre: the lower edge of the text is put on the outside off the circular arc; the text is aligned in the anti-clockwise direction on the circular arc. The centre of the text lies on the reference point.
- Circle O right: the lower edge of the text is put on the outside off the circular arc; the text is aligned in the anti-clockwise direction on the circular arc. The end of the text lies on the reference point.

Note
The origin of the coordinate system (0,0) always lies in the lower left corner of the marking area.

Creating a new text field

1. Select *File > New mask*.
   "Mask data" appears.



Mask "Mask data" Fig. 10540en

2. Enter the number of the text field behind "Textfield".

3. Select the desired type of text field (see page 4-8) behind "Type".
   Depending on the selected "Type" a different number of further input fields are displayed.
4. Select the desired alignment of the text field (see page 4-8) behind "Alignment".
5. Enter the X-, Y- and Z-position of the reference point (see Alignment on page 4-8) behind "XPos", "YPos" and "ZPos".

   or

   - Select to teach the position of the reference point.

   "Teach In" appears.

Mask "Teach In" Fig. 10657en

   - Enter the step width behind "Stepwidth". The position of the reference point is moved by this value when selecting , , or .
   - To teach the X- or Y-position: select , , or .
   - Select .
6. Enter the marking speed behind "V [mm/s]".

Note
Text field with V = 0 mm/s are not marked and are displayed in the preview in blue colour.

7. Enter the character height of the capital letters in [mm] behind "Height". Heights from 0.5 to 99.9 mm can be entered. When marking a data matrix enter the "Dot size" in [mm].
8. If the characters of the text shall be marked wider or smaller than standard: enter a value unequal to 1.0 behind "Widthfactor". Character widths from 0.1 to 10.0 can be entered.

   0.5 causes half character width, 2.0 double character width.
9. If the spacing between 2 adjacent characters shall be larger than standard: enter a value from 0 to 10 in [mm] behind "Spacing".
10. If the text shall not be marked on a horizontal line: enter the desired angle of rotation of the text in [°] behind "Angle". A vertical text corresponds to an angle of 90°.
11. Enter the diameter of the circular arc in [mm] behind "Diameter", if circular text is marked.
12. Enter the desired text to be marked behind "Text".

    or

    - Select *OL* to access the object list.
    - Look for the number of the desired object.
    - Select to return to "Mask Data".
    - E. g. to mark the object No. 003: enter `%003`.

    or

    - Enter a wildcard, e. g. `@TT.MM.JJ@` (see page 4-13).
13. To select the "Font":
    - Select *CHR*.
    - Select the desired font from the list (overview fonts see page 4-52).
    - Select .
14. To see a preview of the text to be marked: select .

Editing a text field

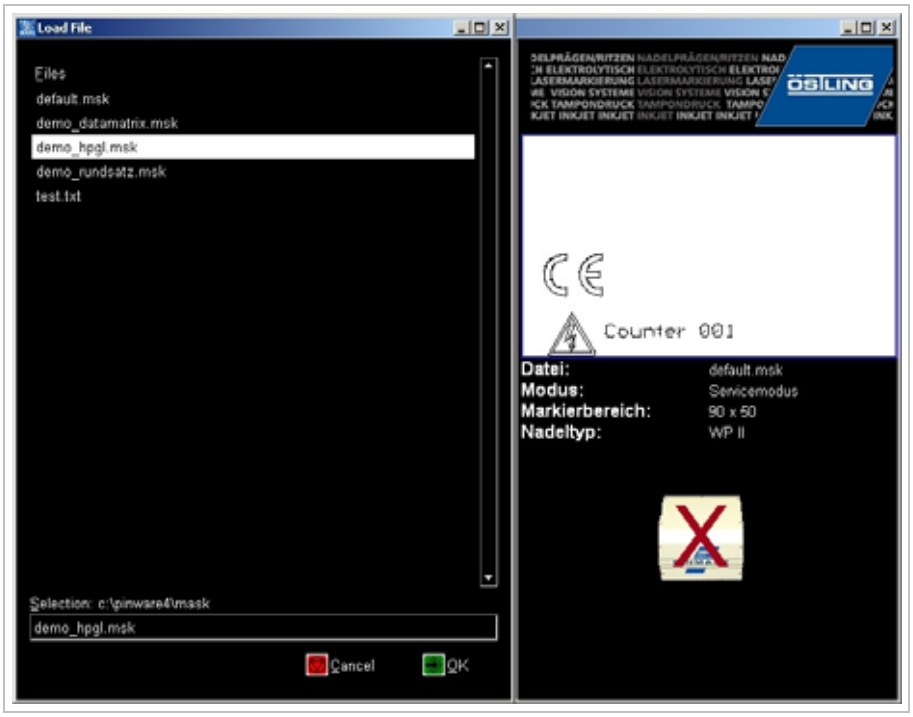
A text field that is already created can be edited in the edit or service mode at any time.

1. If the mask in which the text field shall be edited is not the current mask: select *File > Open mask* in the main menu.

   or

   - Select *Load file*.

   "Load File" appears.



Mask "Load File" Fig. 10541en

2. Select the desired file (mask).

   Preview is shown on the right side of the display. If the content of the file is too large for the selected marking field the numbers behind "Marking Area" are displayed in red colour.

3. Select .
4. Select *Edit > Mask* in the main menu.

   or

   - Select *Edit File*.

5. Enter the number of the text field to be edited behind "Textfield".

   or

   - Select the desired text field with the arrow keys.

6. Edit the text field (see page 4-9).

3.2 Working with wildcards

Instead of text also a wildcard can be entered in a text field. With wildcards variable information (e. g. current date or time) can be marked. The information isn't queried by the system until the marking takes place.

Wildcards are included by 2 "@" characters. Several wildcards can be combined. The characters . - , : / and the blank can be used together with wildcards, in order to obtain e. g. usual formatting of dates.

The following wildcards are available:

Type of wildcard	Entry	Result	Example
Day	T	Day in the week	1, 2, 3, ..., 7
Day	TT	Day in the month (two-digits)	01, 02, 03, ..., 31
Day	ttt	Day in the year	1, 2, 3, ..., 366
Week	KW	Week (two-digits)	01, 02, 03, ..., 53
Week	W	Week in the month	1, 2, 3, 4, 5
Month	MM	Number of the month (two-digit)	01, 02, 03, ..., 12
Year	J	Date (last digit)	0, 1, 2, ..., 9
Year	JJ	Date (last 2 digits)	98, 99, 00
Year	JJJJ	Date (four-digit)	2005
Time	hh	Hour (two-digit)	00, 01, 02, ..., 23
Time	mm	Minute (two-digit)	00, 01, 02, ..., 59
Time	ss	Second (two-digit)	00, 01, 02, ..., 59
Counter	arbitrary number	Number which is increased automatically.	100, 101, 102, ...

Tab. 1

Example:
A text field with the content: Date: @TT.MM.JJ@ Time: @hh:mm@
e. g. generates: Date: 19.01.05 Time: 09:26

3.3 Creating objects

In addition to wildcards, objects can also be entered in text fields. The following objects are available:

- Counter.
- Date and time.
- User input: text field is reserved for data that are entered by the user just before the marking. The query of the data occurs automatically.
- Shift index.

Objects are saved in an object list and can be inserted in as many masks as desired. E. g. if a four-digit counter is needed on several different workpieces, which begins with 0 and ends with 250, this counter must be created only once.

Note
If "Autosave" is selected under *System > Options*, the current counter value is saved in the object list, too.

Objects are activated with a "%" character. Several objects can be combined. The "%" character is entered via `%%`.

Creating a counter

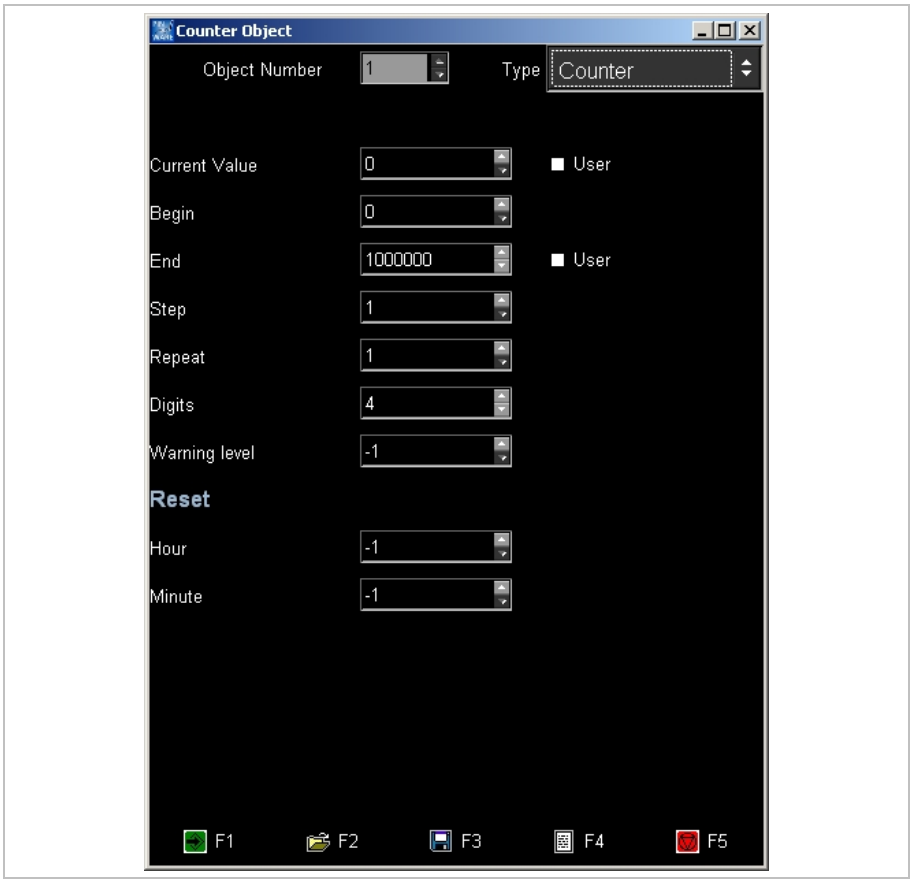
1. Select *Edit > Object List*.

   or

   - Select *OL* in "Mask Data".

   "Object List" appears.
2. Select unimplemented object or object "Counter" to be changed and select ENTER.

   "Counter Object" appears.



Mask "Counter object" Fig. 10542en

3. Enter the following values:
   - "Current Value": current value of the counter. Select "User" if the current value of the counter shall be queried from the user by a message (see also Fig. 10235, page 4-19).
   - "Begin": minimal value of the counter.
   - "End": maximal value of the counter. Select "User" if the maximal value of the counter shall be queried from the user by a message (see also Fig. 10235, page 4-19).
   - "Step": increment to increase the counter.
   - "Repeat": number of markings before the counter is increased one "Step".
   - "Digits": number of digits marked.
   - "Warning level": number of markings before "End" when the software displays a message that only x markings can be done before the maximal value of the counter is reached. When inserting `-1` no message is displayed.
   - "Reset, Hour", "Reset, Minute": number of operating hours and minutes after that the counter is reset to "Begin".
4. To assume the object in the object list: select .

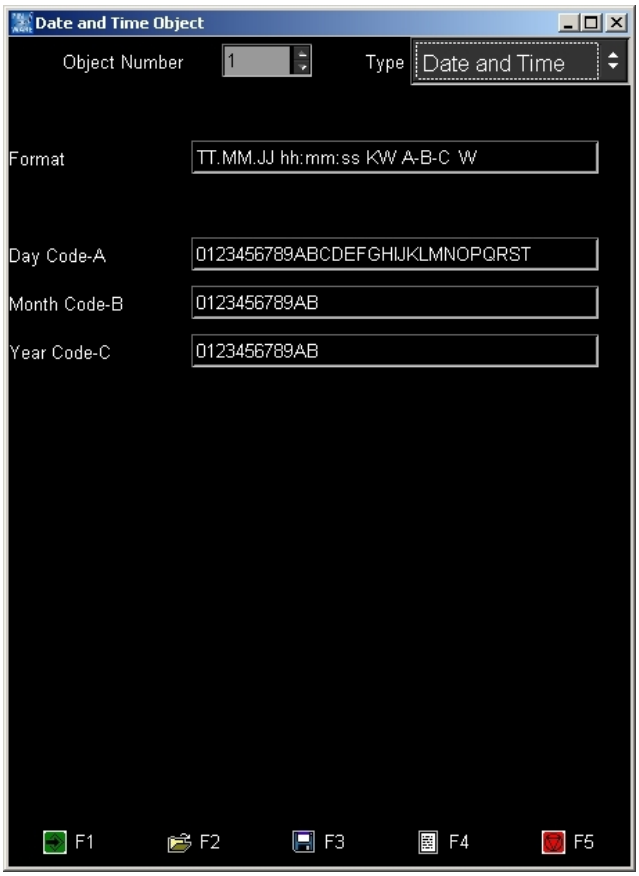
Creating the object "Date and Time"

1. Select *Edit > Object List*.

   or

   - Select *OL* in "Mask Data".

   "Object List" appears.
2. Select unimplemented object or object "Counter" to be changed and select ENTER.
3. Select "Date and Time" behind "Type".



Mask "Date and Time Object" Fig. 10634en

4. Enter the value "Format": format of the date/time (see "Working with wildcards" page 4-13).

5. If desired, also special formats of the date can be marked: enter the letters A B C (if desired with separators) and the values of A, B and C in the lower rows:
   - "Day Code-A": 31 digits or letters from which the digit and/or the letter is marked which corresponds to the current day.
   - "Month Code-B": 12 digits or letters from which the digit and/or the letter is marked which corresponds to the current month.
   - "Year Code-C": 10 digits or letters from which the digit and/or the letter is marked which corresponds to the current year.
6. To assume the object in the object list: select .

Creating the object "User Input"

1. Select *Edit > Object List*.

   or

   - Select *OL* in "Mask Data".

   "Object List" appears.
2. Select unimplemented object or object "Counter" to be changed and select ENTER.
3. Select "User Input" behind "Type".

Mask "User Input" Fig. 10544en

4. Enter the following values:
   - "Message": message that is displayed if the system waits for an input from the user, e. g. Fig. 10235. The message is only displayed if behind "Enable Prompt" "Once" or "Everytime" is selected.

Fig. 10235en

- "Enable prompt": frequency how often the message (see Fig. 10235) is displayed.
- "Default Data": data that is displayed in the message behind "Please enter data" (see Fig. 10235).
- "Current Data": enter nothing. These are the data that are entered by the user just before the marking.
- "Length": max. number of digits of the text to be marked.

5. To assume the object in the object list: select .

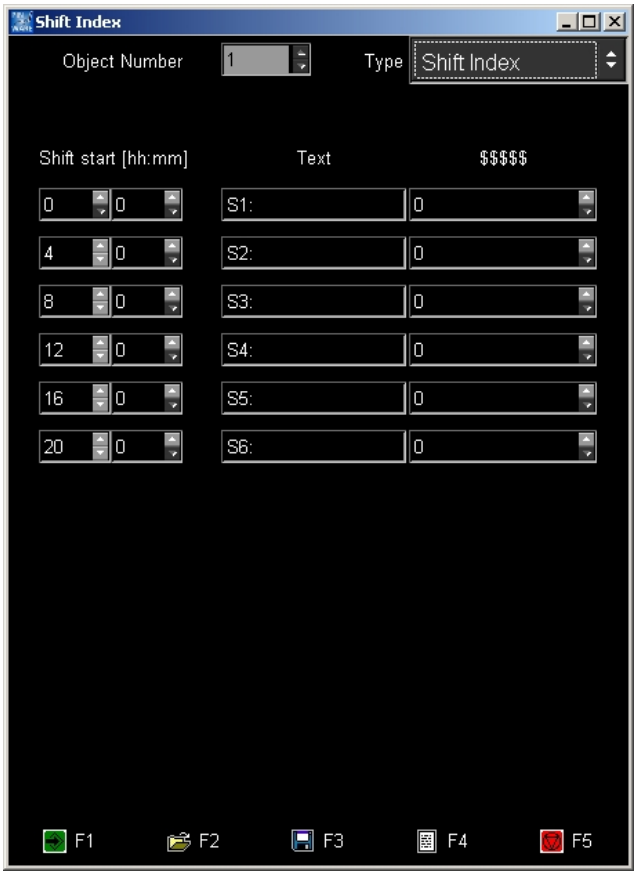
Creating a shift index

1. Select *Edit > Object List*.

   or

   - Select *OL* in "Mask Data".

   "Object List" appears.
2. Select unimplemented object or object "Counter" to be changed and select ENTER.
3. Select "Shift Index" behind "Type".



Mask "Shift index" Fig. 10545en

4. Enter the following values:
   - "Number of shifts": enter the number of shifts (max. 6).
   - "Shift start": enter the hour of the shift start in the first column. Enter the minute of the shift start in the second column.
   - "Text": displayed text, when the current time corresponds to the relative shift.
   - "$$$$$": enter nothing. This is a counter counting the parts that are marked in each shift. The counter is reset to "0" at change of shift.
5. To assume the object in the object list: select .

3.4 Saving masks

1. Create the mask with all desired text fields (see paragraph 3.1, page 4-8).
2. Select *File > Save Mask*.

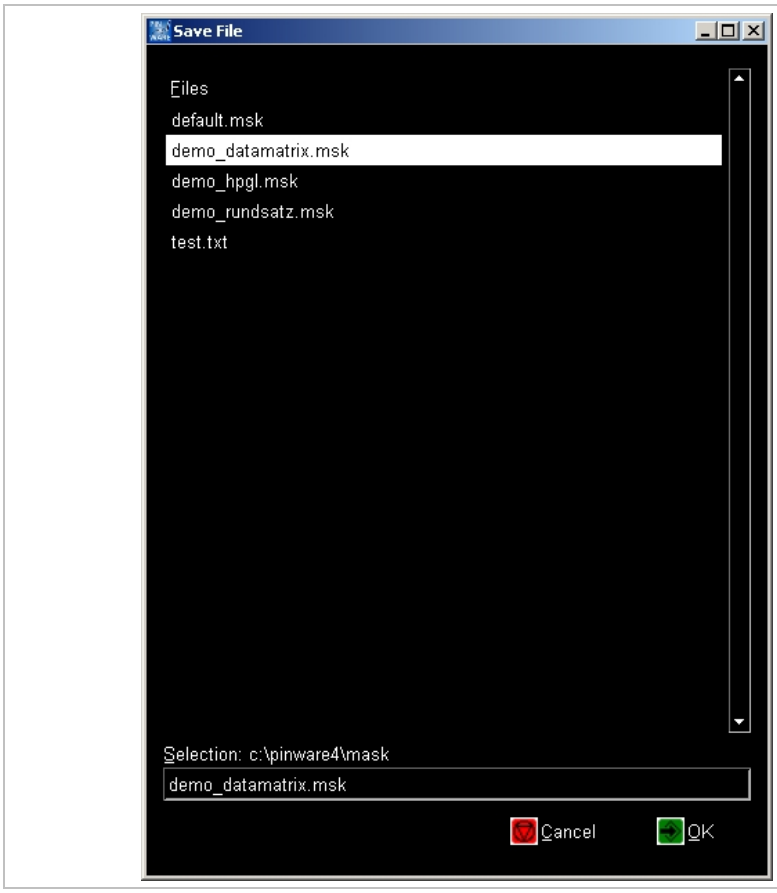
   If a new mask is saved (mask doesn't have a file name yet) "Save File" appears.

   If the mask has been saved once and therefore has a file name, the mask will be saved. The following steps are inapplicable.

   or

   - Select *File > Save Mask As*.

   "Save File" appears.



Mask "Save File" Fig. 10546en

3. Enter file name you wish to give to the mask.

   The ending '.msk' is automatically added by the software.
4. Select .

4 Working with projects

If the same masks are used on different marking units with different marking heads, the masks can be stored as projects. Beside the mask with all text fields a project contains also all current adjustments e. g. used marking head. If the mask is stored as project, these adjustments must be entered only once for each marking head. If the mask is to be marked again with one of these marking heads, just open the corresponding project.

4.1 Saving a mask and adjustments as project

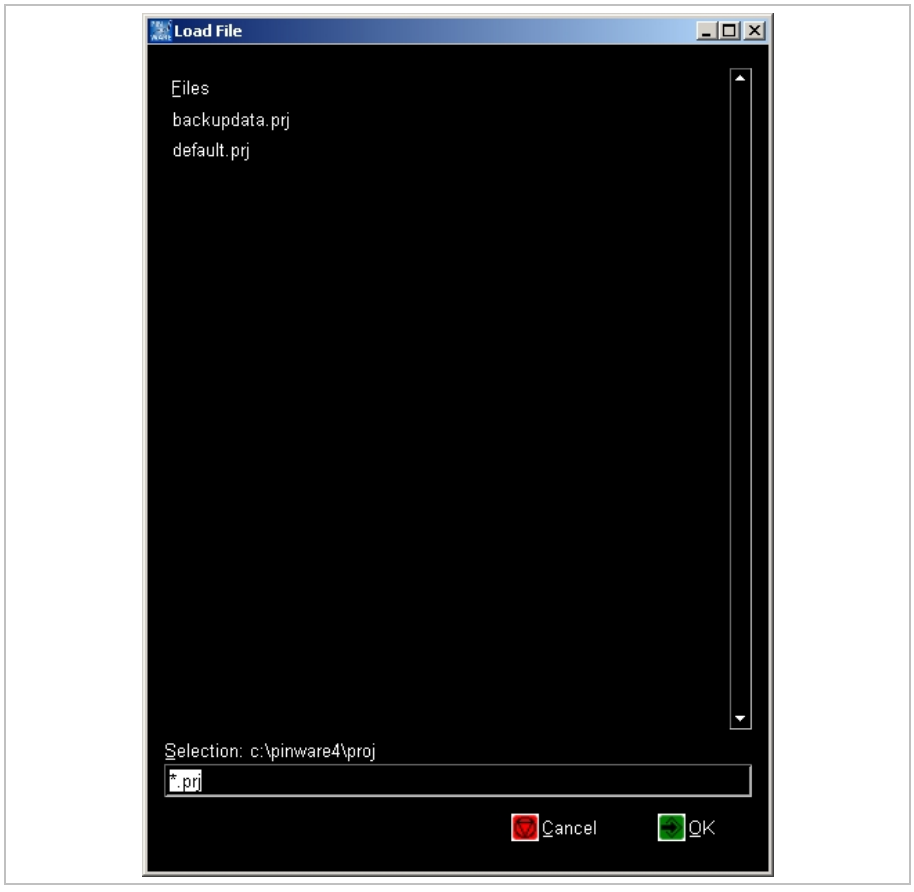
1. Create the mask with all desired text fields (see paragraph 3.1, page 4-8).
2. Enter all other adjustments, e. g. used marking tool (see paragraph 7.6, page 4-39).
3. Select *File > Save Project As*.
   "Save File" appears.

Mask "Save File" Fig. 10547en

4. Enter file name you wish to give to the project.
   The ending '.prj' is automatically added by the software.
5. Select .

4.2 Opening a project

1. Select *File > Open Project*.
   "Load File" appears.



Mask "Load File" Fig. 10548en

2. Select the desired file (project).
3. Select .
   Project is opened: mask which is stored in this project is opened, all stored adjustments are assumed by the control.

Note
The marking unit does **not** give a feedback to the control which marking head or which marking tool is attached to the marking unit. When working with projects the stored adjustments must be controlled by the user.

5 Marking a workpiece

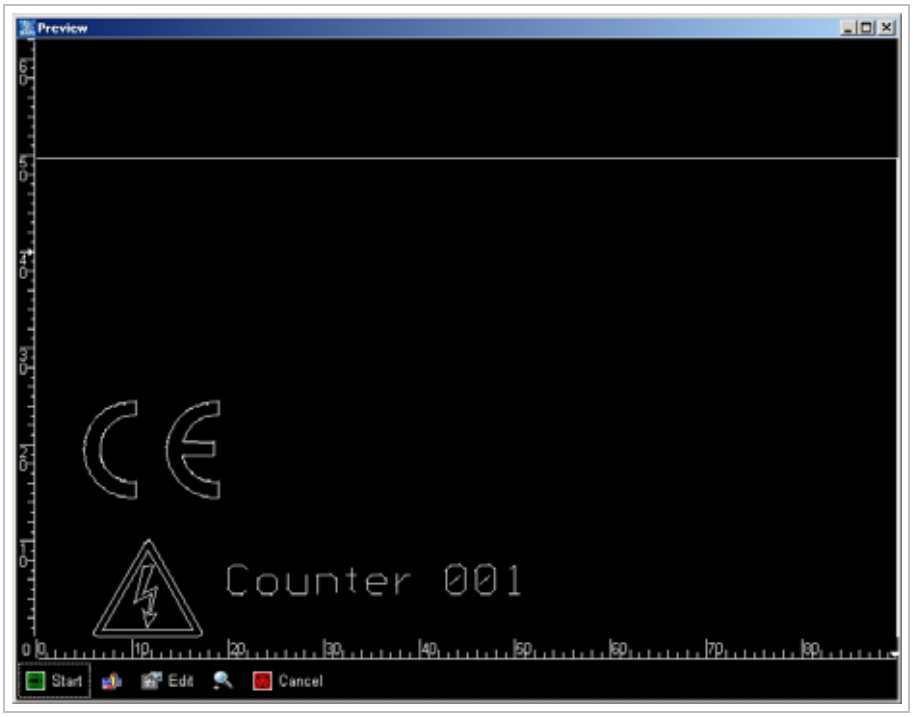
5.1 Preview on marking

1. To see a preview of the mask to be marked: select *Marking > Preview*.

   or

   - Select in "Mask Data".

   "Preview" appears.



Mask "Preview" Fig. 10549en

2. To scale up the view: select .
3. To reset the view to normal view: select .
4. To make still some changes in the mask: select *Edit*.
5. To control the marking movements of the marking tool without marking the workpiece: select .
   Marking head retraces the marking without movement of the marking tool.

5.2 Starting the marking

1. Select *Marking* > *Start*.

   or

   - Select *Start* in "Preview".

   "Print" appears.

Mask "Print" Fig. 10550en

2. Enter the number of workpieces to be marked behind "Number".
3. Select to start the marking.
   After the marking, the system indicates behind "Time" how long the marking has lasted in [s].
4. To mark another workpiece: select again.

6 Further functions

6.1 Managing files

A file manager is integrated in the software with which files of each format can be copied from USB stick or network drive to the control UMC 112 or vice versa.

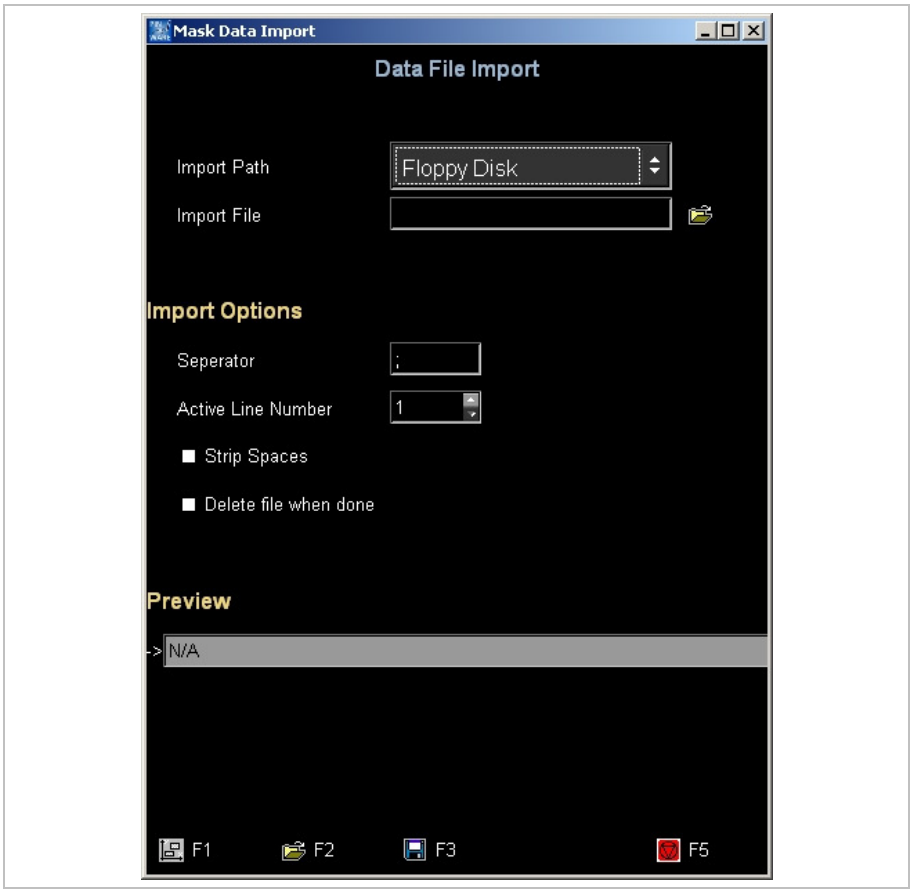
1. Select *File > File manager*.
   "File manager" appears.
2. In the top left-hand corner select the desired external drive from which files are to be copied to the UMC 112 or vice versa.
3. To copy files to the UMC 112:
   - Select the desired file on the external drive in the left field.
   - Select <→>.
4. To copy files from the UMC 112 to the selected external drive:
   - Select the desired directory in the top right-hand corner.

   All files of the selected directory are displayed.
   - Select the desired file on the UMC 112 in the right field.
   - Select <←>.
5. To delete a file on the UMC 112:
   - Select the desired file in the right field.
   - Select .

6.2 Importing data

Texts from files which are on an external storage medium (disk, net drive assembly) can be imported. The software assumes all characters from the file. These characters are inserted in one or more text fields of one or several masks.

1. Select *Edit > Data import*.
   "Mask Data Import" appears.



Mask "Mask Data Import" Fig. 10551en

2. Select the desired "Import Path".
3. To open the directory in which the file with the data to be imported is saved: select behind "Import File".
   "File Selection" appears.
4. Select the desired file.
5. Select .
   "File Selection" is closed.

6. Enter the import options (see also Fig. 10551):
   - "Separator": enter the character that separates the individual texts in one line, e. g. ;. The entire text between separators is inserted into a text field of the mask.
   - "Active line number": enter the line number of the file with the data to be imported. Each line of the file is used as a mask.
   - "Strip spaces": select if you don't want to mark leading space characters.
   - "Delete file when done": select if the file is to be deleted after the import.
7. Select .

   "Preview" appears. Since the marking speed is by default set to 0 mm/s in new text fields, the text in the preview is displayed in blue colour.
8. Select *Edit* and enter a marking speed "V [mm/s]" > 0.

6.3 Changing the mode

3 different modes are available at the control:

- Work mode: files (projects and masks) can be loaded and marked.
- Edit mode: files (projects and masks) can be loaded, changed and marked. It is also possible to create new masks and projects.
- Service mode: all operating functions are possible. E. g. also system parameters can be changed.

The mode of the control can be changed at any time. If the edit and/or service mode is protected with a password, (see page 4-45), the password must be entered.

1. Select *Edit* > *Mode*.

   "Password Dialog" appears.
2. Select the desired mode.
3. If the desired mode is protected with a password, you have to enter the password: enter password.
4. Select .

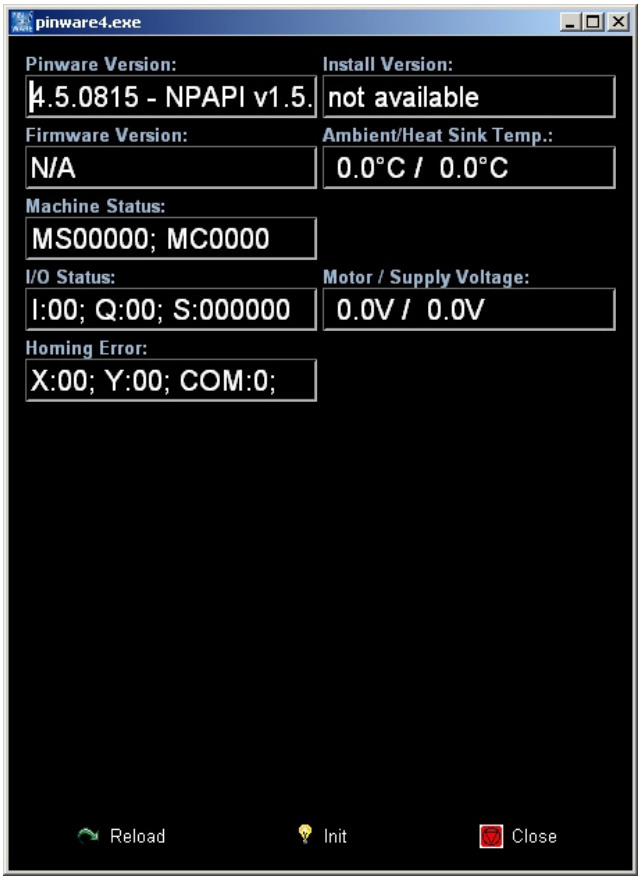
Control is changed to the selected mode.

7 System control

7.1 Reading out diagnostic data

➢ Select *System > Diagnostic*.

"Diagnostic" appears.



Mask "Diagnostic" Fig. 10552en

- Pinware Version: software version that is installed on the control.
- Install Version: version of the compact flash card.
- Firmware Version: software version of the motor card.
- Ambient/Heat sink temperature: temperature of the ambient air in [°C] and temperature of the heat sink of the motor card in [°C].

- Machine status:
  - MS: system status, 5-digit. Contains information about temperatures, voltage ranges and output drivers.

Digit	Description	Status	Description of the status
left-most	Output driver	0	Error.
		1	OK.
2. from left	Supply voltage: voltage in [V] that impressed to the motor card.	0	No voltage.
		1	Voltage OK.
		2	High voltage.
		3	Too high voltage, error.
		4	Low voltage.
		5	Too low voltage, error.
middle	Motor voltage: voltage in [V] that is impressed to the motor.	0	No voltage.
		1	Voltage OK.
		2	High voltage.
		3	Too high voltage, error.
		4	Low voltage.
		5	Too low voltage, error.
2. from right	Heat sink temperature	0	Sensor not attached.
		1	Temperature OK.
		2	High temperature.
		3	Too high temperature, error.
right-most	Ambient temperature	0	Sensor not attached.
		1	Temperature OK.
		2	High temperature.
		3	Too high temperature, error.

Tab. 2

  - MC: motor status, 4-digit. Each digit symbolises a coil of a motor (2 motors with 2 coils each). The two left digits contain information about motor 1, the two right digits contain information about motor 0.

Status	Description of the status
0	Motor coil not attached. Cable or coil can be defective. Depending on the software version the motor driver is switched off and displays the status "0" for both coils of a motor.
1	Motor coil OK.
2	Error during measuring of the motor current. The difference between set and measured current is too high.
3	Although the motor coil is switched off a motor current is measured. The circuit board, stepper driver or microcontroller can be defective.
4	Motor current too high. Output is switched off.
9	General error, e. g. motor voltage switched off.

Tab. 3

- I/O Status: status of the inputs and outputs (BU1) in hexadecimal notation.
- Motor/Supply voltage: voltages in [V] that are impressed to the motor and the motor card.
- Homing error: status (0 = error, 1 = OK) of the homing of the X- and Y-axis. Number of the output to which the axes are connected.

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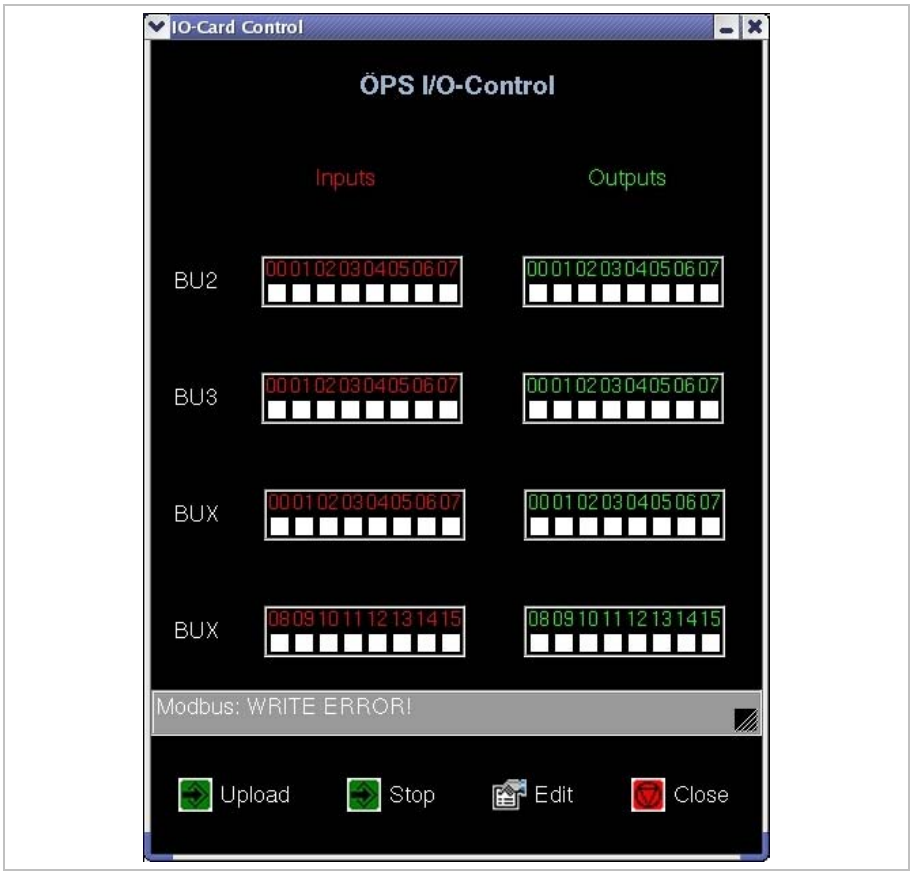
7.2 Controlling digital inputs and outputs

1. Select *System > SPS Control*.
   "I/O Control" appears.



Mask "I/O Control" Fig. 10637en

All available inputs and outputs of the control board are displayed:

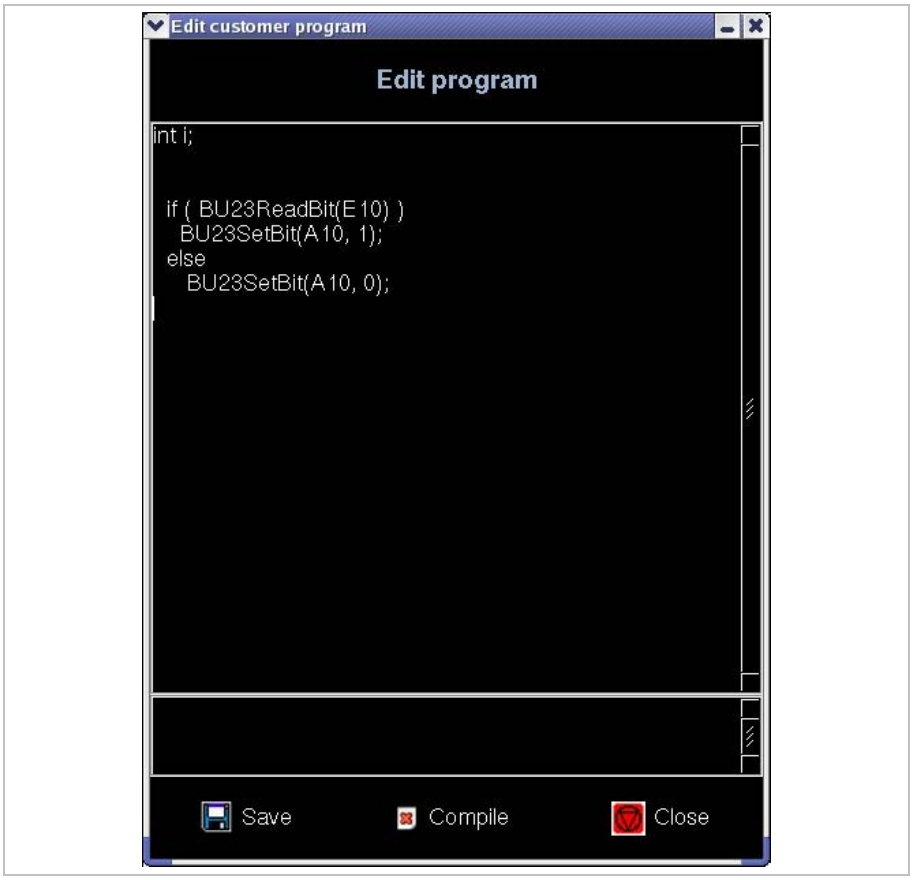
- Inputs: all set inputs are displayed in blue colour. The inputs are only displayed; they can't be set via the control.
- Outputs: all set outputs are displayed in blue colour. For trouble-shooting the outputs can be set and reset via the control.

2. To load a program to program the control board of the inputs and outputs: select *Upload*.
3. To start the I/O program: select *Start*.
   After the program has started the button changes to *Stop*.
4. To stop the I/O program: select *Stop*.

5. To edit the I/O program:

   - Select *Edit*.

   "Edit program" appears.

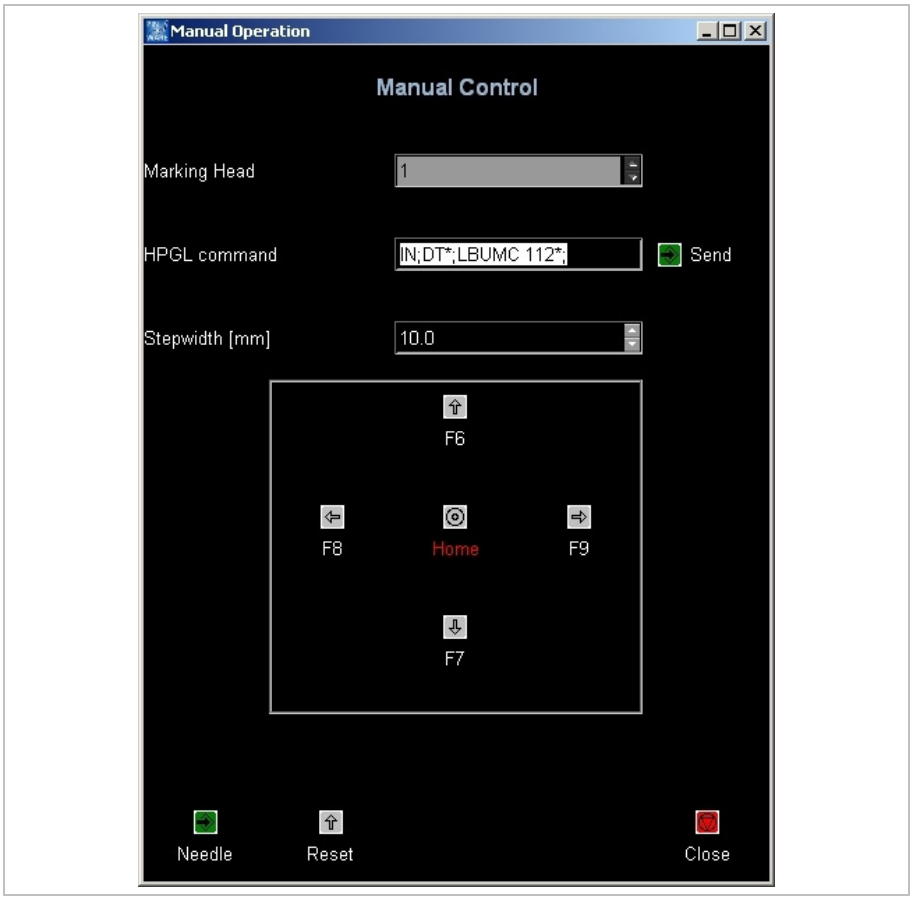


Mask "Edit program" Fig. 10577en

- Edit the I/O program as desired.
- Select *Compile*.
- Select *Save*.

7.3 Operating the marking head in manual operation

1. Select *System > Manual Control*.
   "Manual Operation" appears.



Mask "Manual Operation" Fig. 10638en

2. Select the desired marking head behind "Marking head".
3. To move the marking tool manually: enter step width in [mm].
4. Select F6 to F9 to move the marking tool in the desired direction.
5. To operate the marking tool with HPGL commands: enter HPGL command and select *Send*.

   Note
   The motor card uses HPGL commands to control the marking head. The plotter language was created by Hewlett Packard to process vector data for plotters.

6. To move home the marking tool: select *Home*.
7. To move the marking tool up and down once: select *Needle*.

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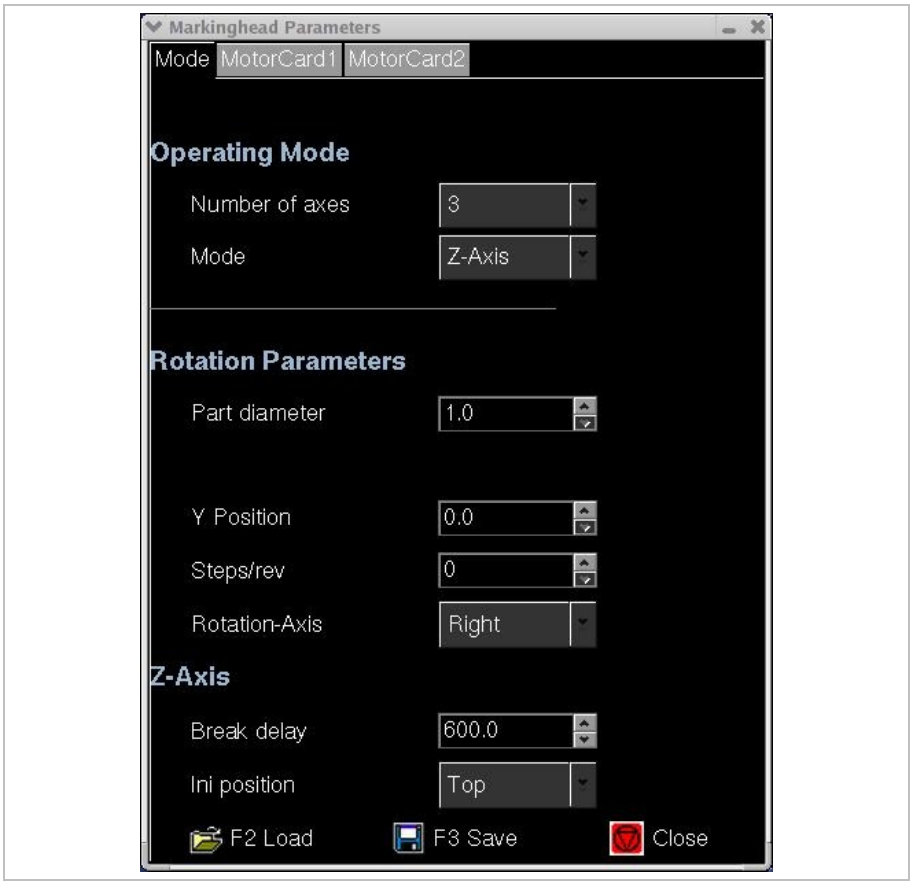
ÖSTLING

7.4 Setting marking head parameters

1. Select *System > Marking Head Parameters*.
   "Markinghead Parameters" appears.



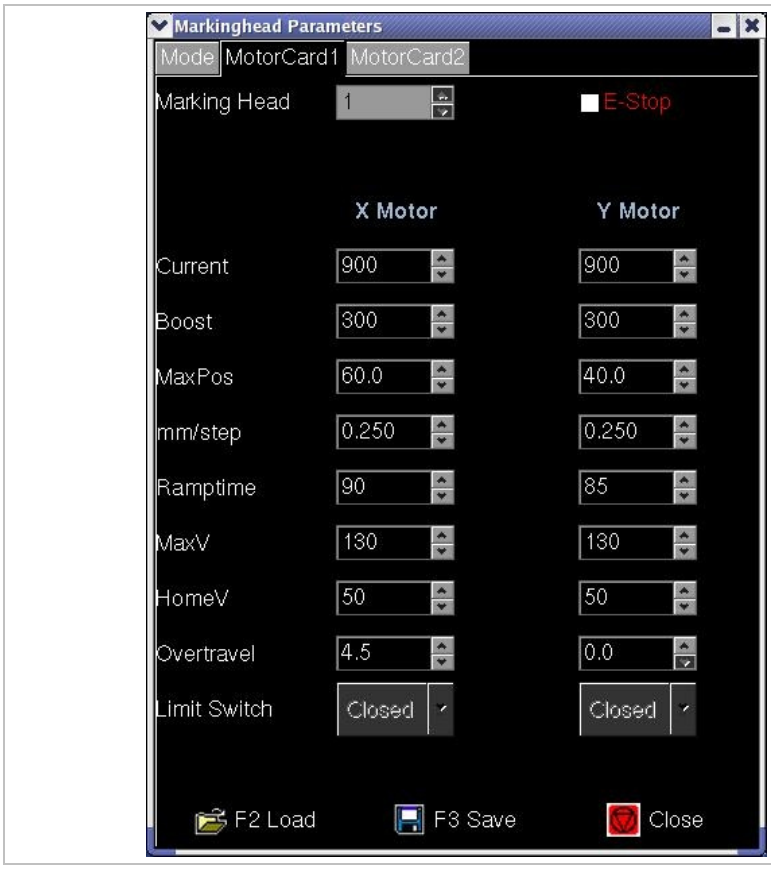
Mask "Markinghead Parameter", tab "Mode" Fig. 10660en

2. Select the desired number of axes.
3. Select the desired mode. The modes change depending on the selected number of axes:

Number of axes	Mode	Note
2	1 head	
	Rotation axis	Y-axis is fix
3	1 head with rotation axis	
	1 head with Z-axis	
	1 head with automatic Z-axis	Z-axis moves down to the workpiece automatically; a special marking tool with initiator must be used.
4	2 heads	
	1 head with Z-axis and rotation axis	

Tab. 4

4. When using a rotation axis:
   - Enter the diameter of the workpiece in [mm].
   - Enter the position of the Y linear axis behind "Y position" or teach it with <Pg Up> and <Pg Dn>.
   - Enter the resolution of the rotation axis behind "Steps/rev".
   - Select the rotating direction of the rotation axis behind "Rotation-Axis".
5. When using a Z-axis:
   - Enter the break delay in [ms].
   - Select the home position of the Z-axis behind "Ini position".
6. Select "MotorCard 1" or "MotorCard 2".



Mask "Markinghead Parameter", tab "MotorCard" Fig. 10661en

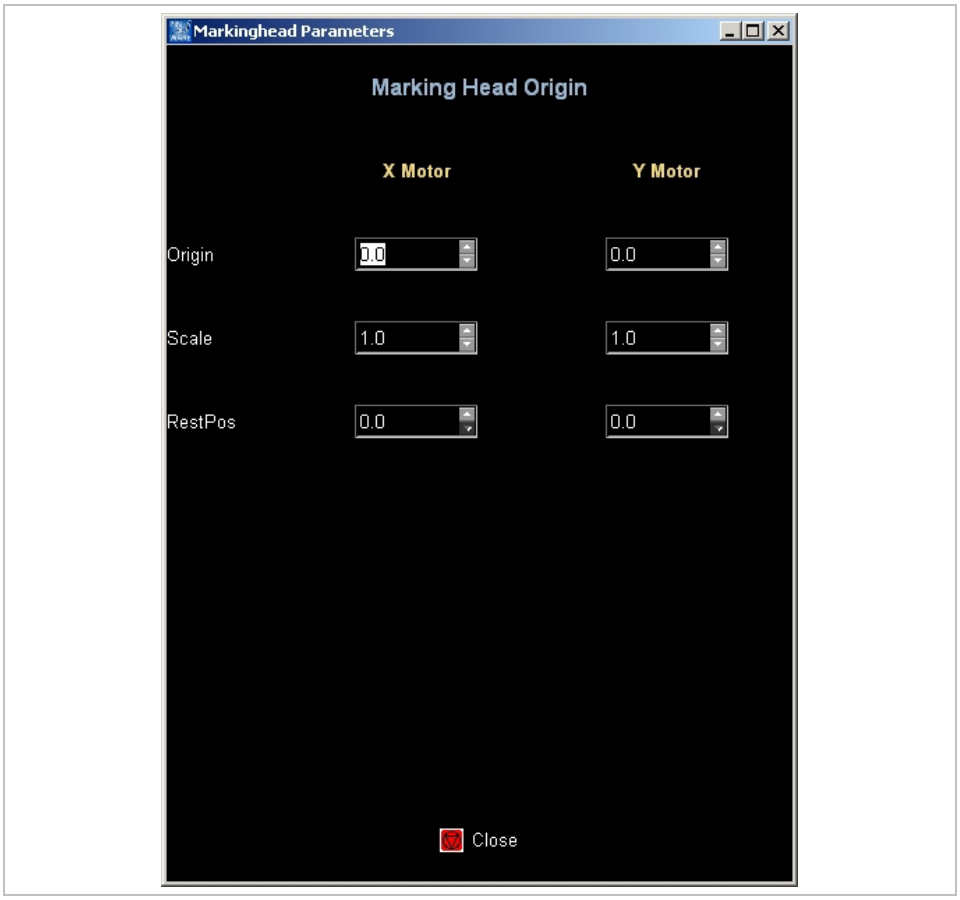
Note
When using 3 or 4 axes (options) the X motor is the rotation axis, the Y motor is the Z-axis.

- Current: motor current in [mA].
- Boost: increase of the motor current in [mA] during ramping.
- MaxPos: maximum position in [mm] the marking head can reach. Accords to the marking field.
  Example: 100 mm in X-direction, 50 mm in Y-direction for marking head 5/10.
- mm/step: with coining heads: feed in [mm] after each drop of the coining tool.
- Ramptime: time in [ms] during which the motor current is increased.
- MaxV: travel speed of the marking head in X- or Y-direction in [mm/s] during deadhead.
- HomeV: speed of the marking head in X- or Y-direction in [mm/s] during homing.
- Overtravel: position of the initiator. An initiator is an inductive proximity switch. Distance of the initiator from home in [mm] in X- or Y-direction.
- Limit Switch: displays if limit switch is a normally closed contact or a normally open contact.

7.5 Displaying marking head origin

➢ Select *System* > *Marking Head Origin*.

"Markinghead Origin" appears.

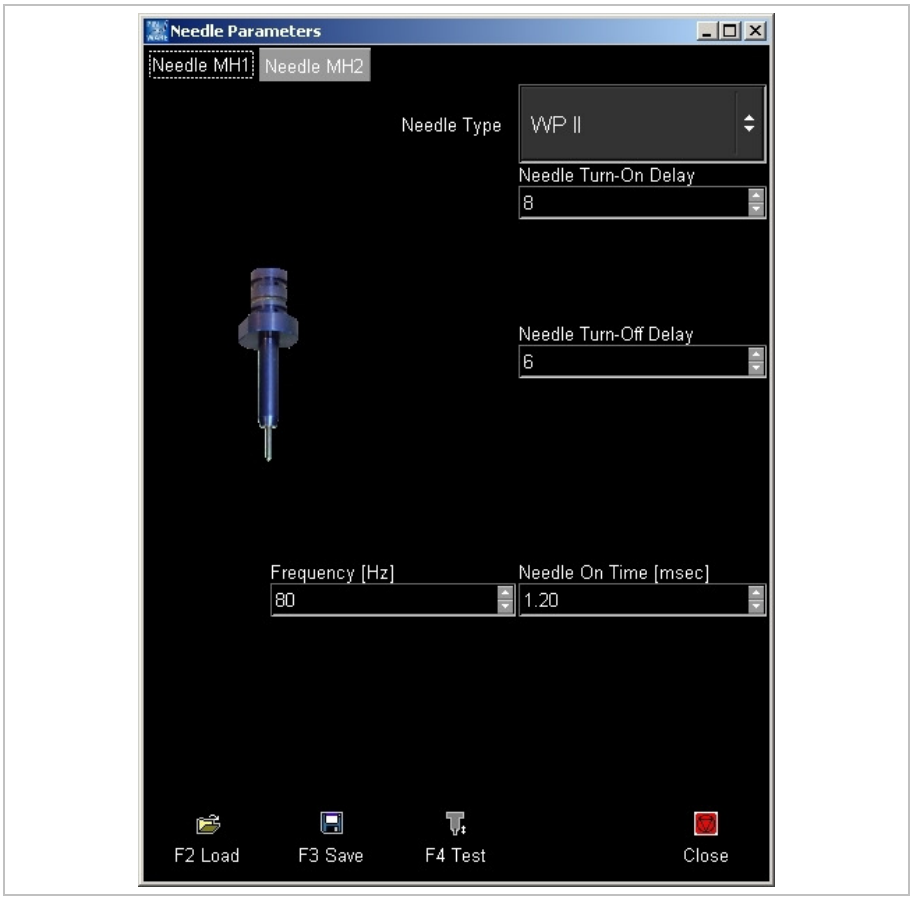


Mask "Markinghead Origin" Fig. 10556en

- Origin: origin of the X- and Y-axis in [mm]. For hand-held units it is useful to displace the origin in order that the marking isn't "turned upside down".
- Scale: the value "-1" causes a mirroring of the axes. Useful for hand-held units, see "Origin".
- RestPos: standby position of the marking head in [mm] in relation to the "Origin".

7.6 Selecting the marking tool

1. Select *System > Needle Parameters*.
   "Needle Parameters" appears.



Mask "Needle Parameters" Fig. 10639en

2. For the marking tool at marking head 1 select "Needle MH 1".

   or

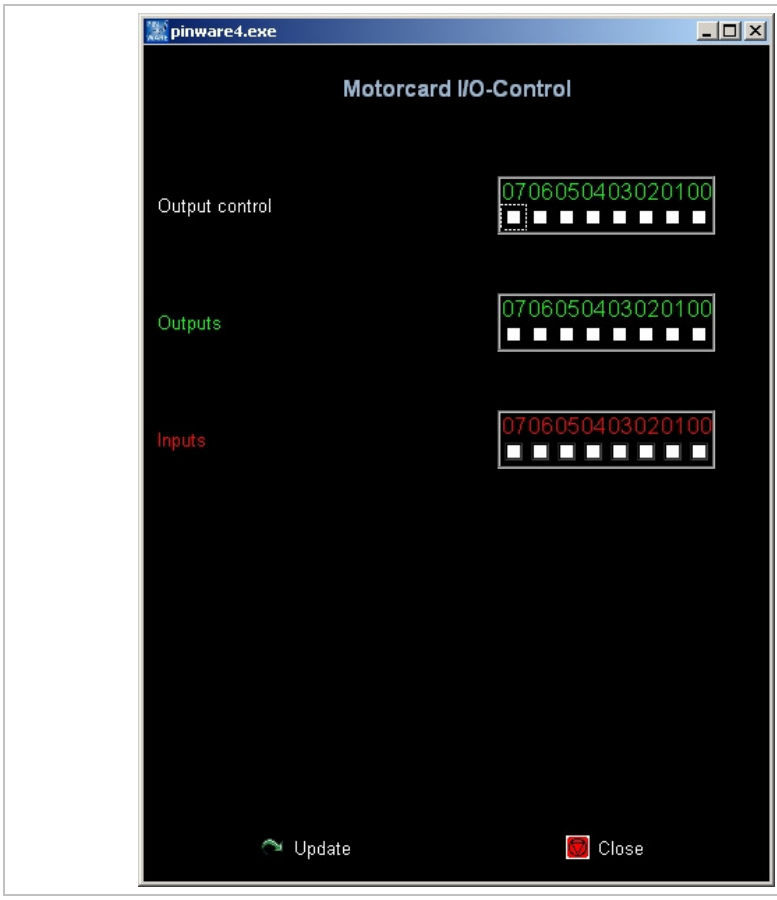
   - For the marking tool at marking head 2 select "Needle MH 2".

3. Select the desired marking tool behind "Needle Type".
   Image of the selected marking tool is displayed.

4. If desired, change the parameters of the marking tool:
   - Turn-on delay: The needle of the marking tool is brought to oscillating by compressed air. Due to the mass inertia of the needle the oscillation achieves the entire amplitude only after short time. Then the marking tool is moved. This time in [ms] is the turn-on delay.
   - Turn-off delay: After switching off the compressed air the needle continues to swing still a short time due to the mass inertia. Only after this time (= turn-off delay) in [ms] the marking tool may be proceeded to the starting point of the next marking.
   - Frequency (only with WP needles): frequency in [Hz] with which the needle is brought to oscillating.
   - Needle on time (only with WP needles): time in [ms] during which the needle is brought to oscillating.
5. To test the marking tool: select .

7.7 Controlling the inputs and outputs of the motor card

1. Select *System* > *Motorcard I/O*.
   "Motorcard I/O-Control" appears.



Mask "Motorcard I/O-Control" Fig. 10564en

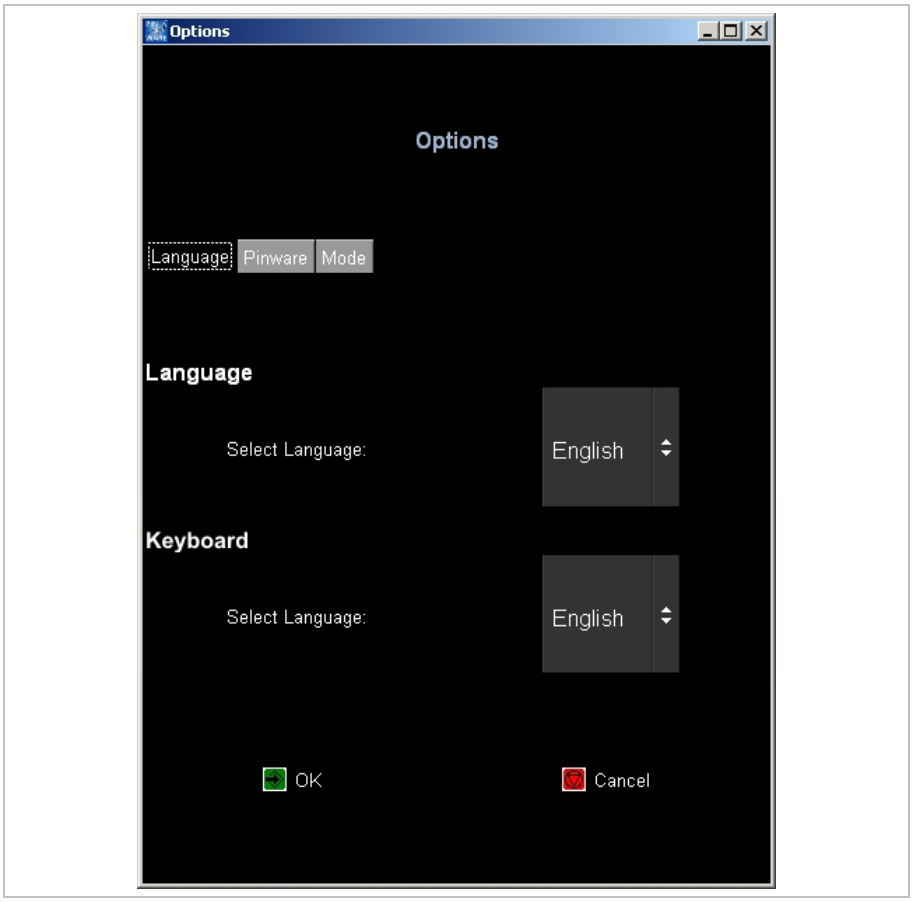
All inputs and outputs of the motor card are displayed. All set inputs and outputs are displayed in blue colour. The inputs and outputs are only displayed; they can't be set via the control.

2. Select *Update* to update the display of the inputs and outputs.

7.8 Setting options

Selecting the language

1. Select *System > Options*.
   "Options" appears.

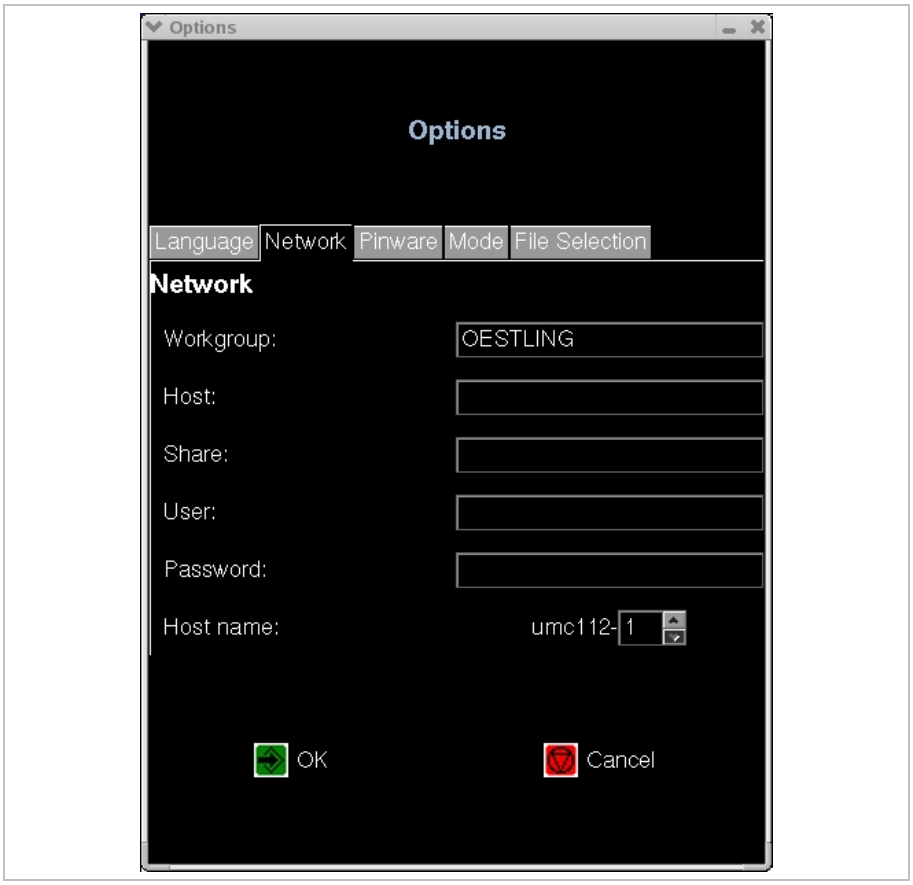


Mask "Options", tab "Language" Fig. 10558en

2. Select the desired language.
3. Select the desired language of the keyboard.
4. To convert the software or keyboard into the selected language: select .

Selecting network settings

1. Select *System* > *Options*.
   "Options" appears.
2. Select "Network".

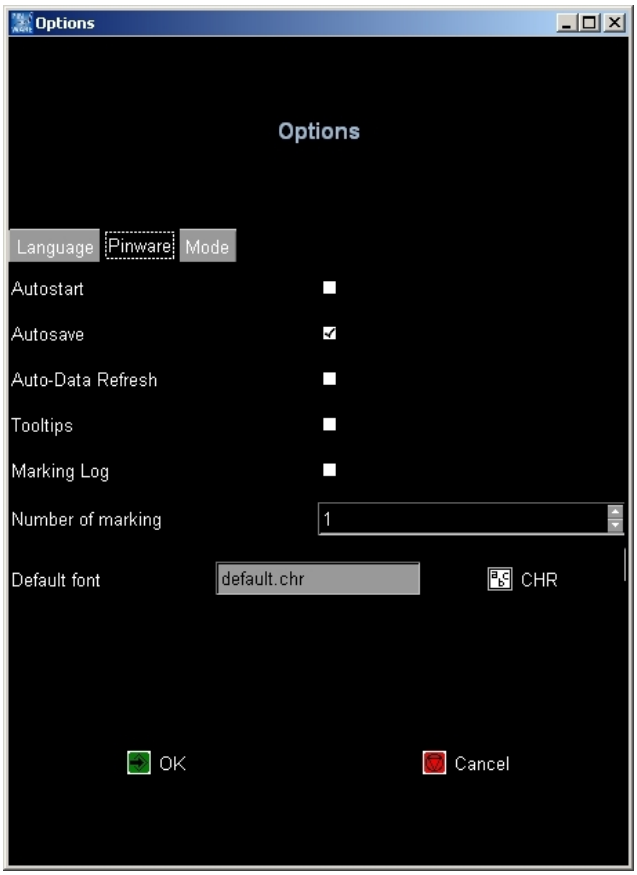


Mask "Options", tab "Network" Fig. 10575en

- Workgroup: workgroup of the network. The control UMC 112 and the computer to be accessed must belong to the same workgroup.
- Host: name or IP-number of the computer to be accessed (optionally).
- Share: share name of the directory (optionally).
- User: user name for the share on the host (optionally).
- Password: password for the user name to access the shared drive (optionally).
- Host name: select the UMC 112.

Selecting software adjustments

1. Select *System* > *Options*.
   "Options" appears.
2. Select "Pinware".



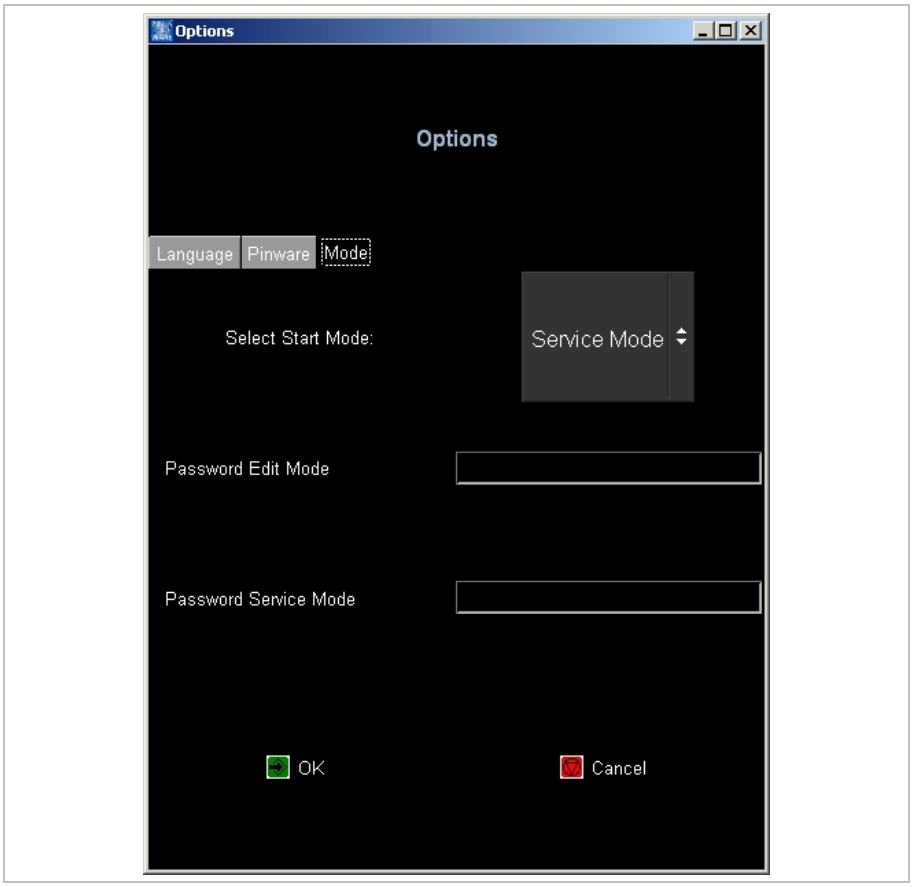
Mask "Options", tab "Pinware" Fig. 10662en

- Autostart: If selected the page "Print" appears directly when booting the control.
- Autosave: If selected the current mask is saved after each marking. Use this function if e. g. the current value of a counter is to be saved.
- Auto-Data Refresh: If selected changeable data (e. g. time, date) refreshed at once.
- Tooltip: If selected tool tips are displayed (short explanations to the field on which the mouse is).
- Marking Log: For each marked mask a log-file with timestamp (*.csv) and marking data is generated.

- Number of marking: default how often a mask is marked. This value is displayed on "Print" behind "Number" (see Fig. 10550, page 4-25). The value "-1" corresponds to endless markings, the field "Number" will not be displayed.
  E. g. if generally at least 10 markings are needed of all masks, "10" can be entered here, so that before each start of a marking the number doesn't have to be set manually to 10.
- Default font: font used by default when creating a mask. Select to change the font.

Changing the start mode of the control

1. Select *System* > *Options*.
   "Options" appears.
2. Select "Mode".



Mask "Options", tab "Mode" Fig. 10560en

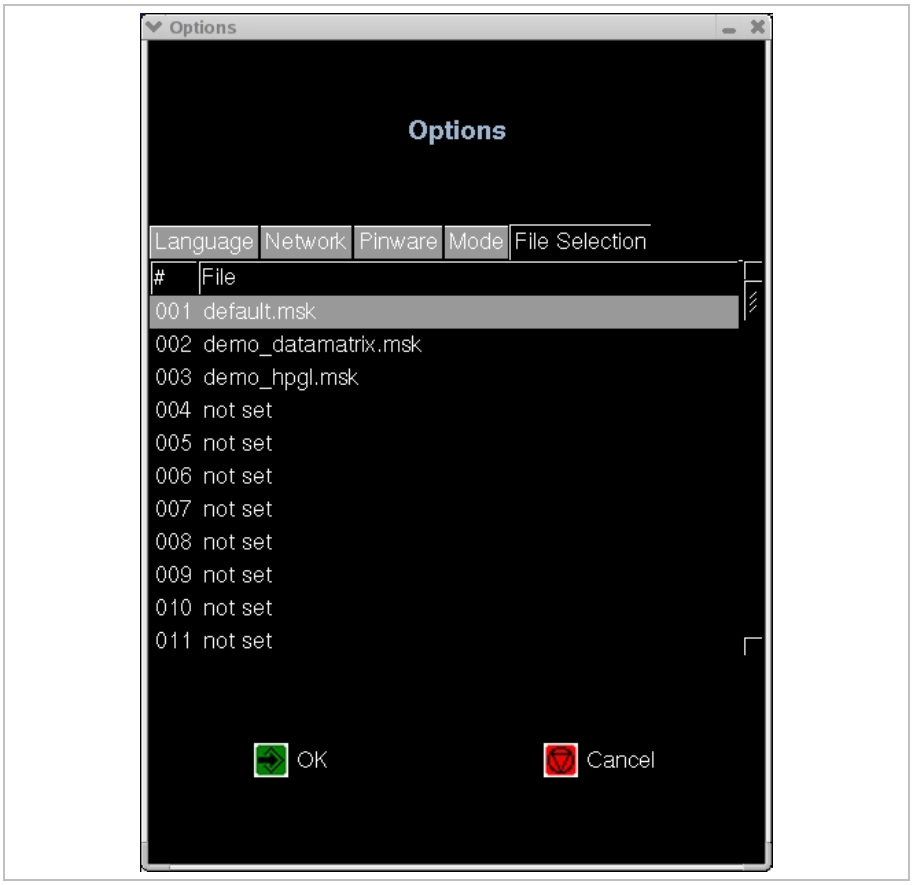
3. Select the desired start mode:
   - Work mode: files (projects and masks) can be loaded and marked.
   - Edit mode: files (projects and masks) can be loaded, changed and marked. It is also possible to create new masks and projects.
   - Service mode: all operating functions are possible. E. g. also system parameters can be changed.
4. If the edit mode is to be made accessible only for a certain person subgroup and therefore is to be protected with a password: enter password.
5. If the service mode is to be made accessible only for a certain person subgroup and therefore is to be protected with a password: enter password.

   Note
   Passwords cannot be read out anywhere! Therefore if possible select a password which cannot be forgotten.

6. Select .

Displaying and sorting files for file selection via socket BU3

1. Select *System* > *Options*.
   "Options" appears.
2. Select "File selection".



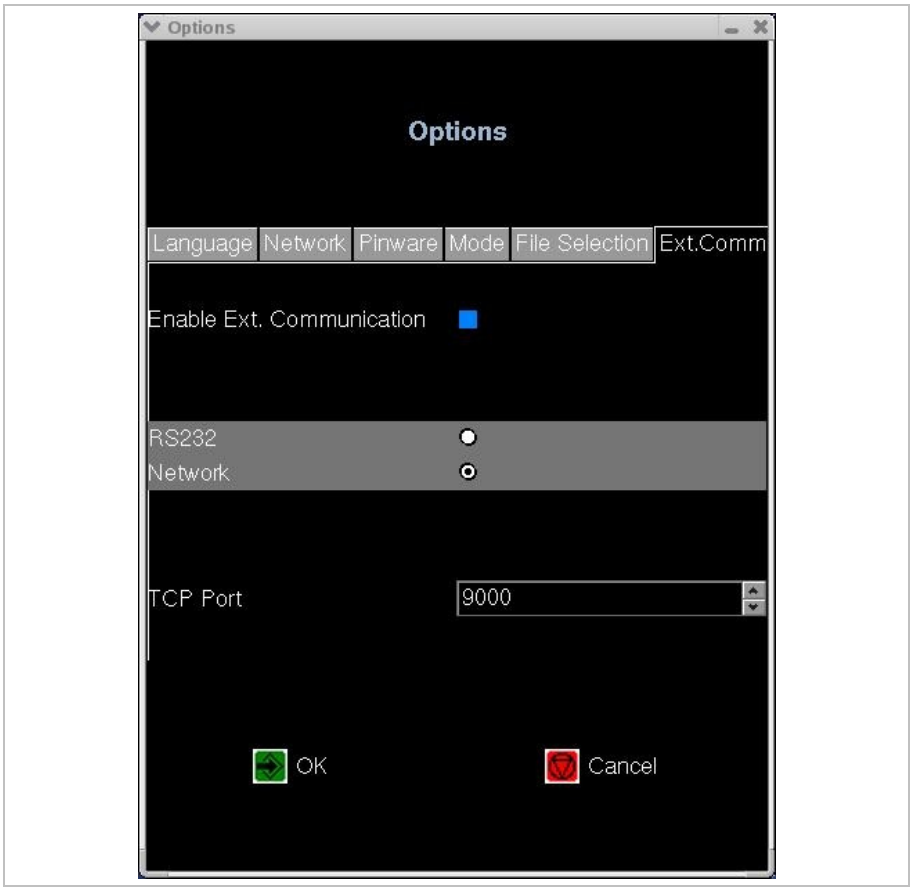
Mask "Options", tab "File selection" Fig. 10574en

Via a PLC (programmable logic control) one mask out of up to 127 masks can be selected and loaded (see chapter 6). These masks can be displayed and sorted in this menu.

3. Press desired key on the keyboard:
   - <F>: list is filled automatically (alphanumeric order).
   - <D>: list is deleted completely.
   - <Del>: marked list item (001 in Fig. 10574) is deleted.
   - <Enter>: assign file name to the marked list item.

Selecting the port for external communication

1. Select *System > Options.*
   "Options" appears.
2. Select "Ext. Comm.".

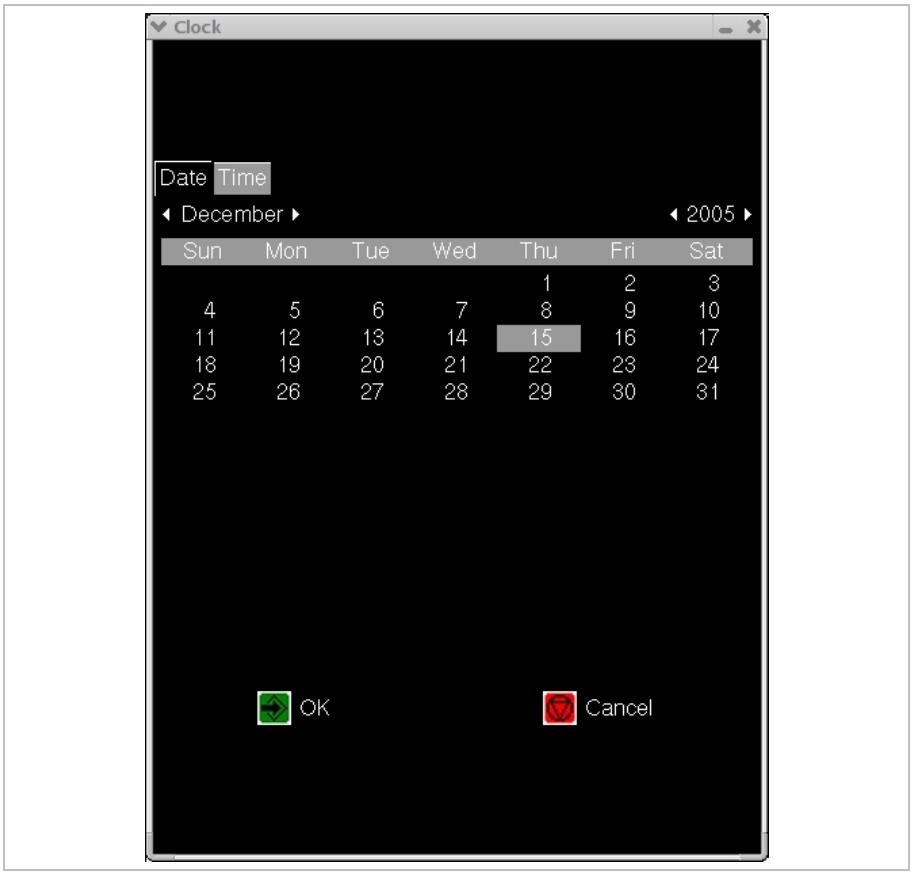


Mask "Options", tab "Ext. Comm." Fig. 10663en

3. Select "Enable Ext. Communication" to be able to send data to the control via the serial port RS232 or the network. For example the control can be remote controlled (see chapter 6).
4. Select the desired port (RS232 or network).
5. Enter the number of the used TCP port. Possible numbers: 1025 to 50000.

7.9 Setting date and time

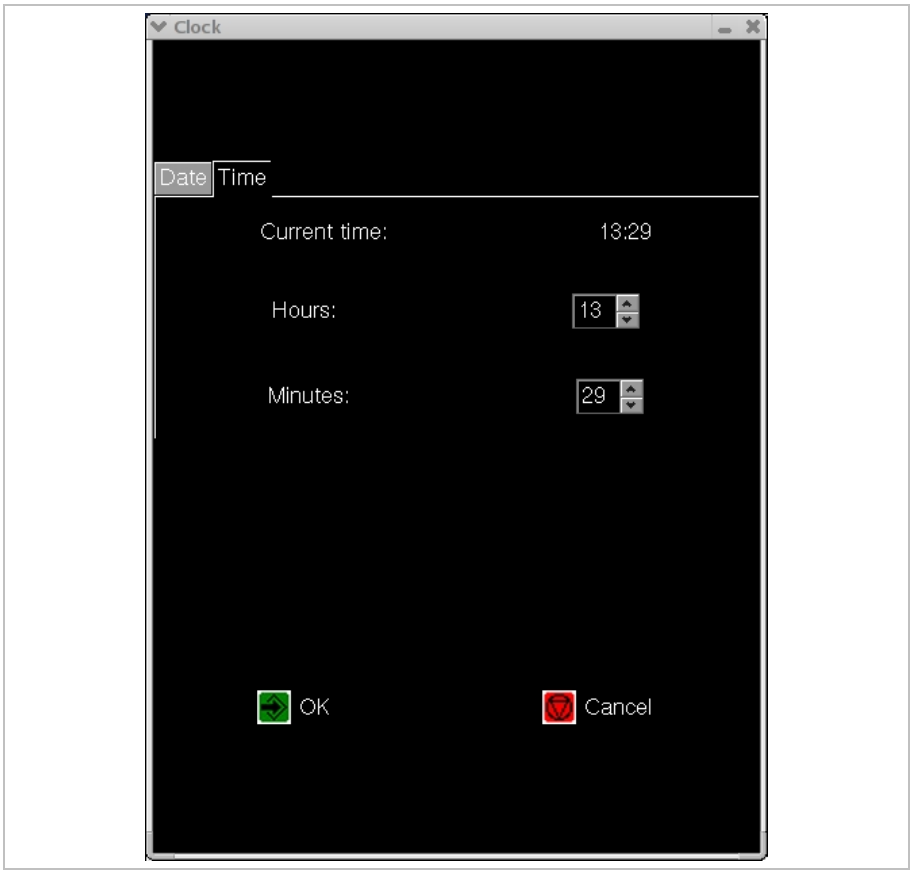
1. Select *System > Time and Date*.
   "Clock" appears.



Mask "Clock", tab "Date" Fig. 10371en

2. To set the actual date: click on the actual date. If necessary change the month or the year using the arrow keys.

3. Select "Time".



Mask "Clock", tab "Time" Fig. 10370en

4. To set the actual time:
   - Select the actual time in hours behind "Hours".
   - Select the actual time in minutes behind "Minutes".
5. Select .

7.10 Saving data on USB stick

One possibility for data backup is available under *System > Backup*:

- Backup: all user-specific data are saved on USB stick.
- Restore: the user-specific data saved with "Backup" are imported in the software.

1. Select *System > Backup*.
   "Backup and Restore" appears.
2. For backup put an USB stick into an USB socket.

   or

   - For restore put the USB stick with the saved data into an USB socket.
3. Follow the instructions on the display.

Further possibilities

In addition to this possibility there are 3 more possibilities for data backup and data exchange:

- File manager (see page 4-26).
- Network.
- Compact Flash card in card reader.

7.11 Updating the software

1. Select *System > Update*.
   "System Update" appears.
2. Put the USB stick with the update files into an USB socket.
3. Select .
4. Wait for request to reboot the control.
5. Switch off control UMC 112 and let it switched off for at least 20 s.

8 Fonts

15 different fonts are available in the software. By default the software uses the font 'litt.chr'. To select another font: select *CHR* in "Mask Data" and select the desired font from the list (see page 4-11).

For every individual of the 31 text fields of a mask you can select another font. As a result of the different layouts of the individual fonts however differences can arise in the character width, height and size.

8.1 Default font

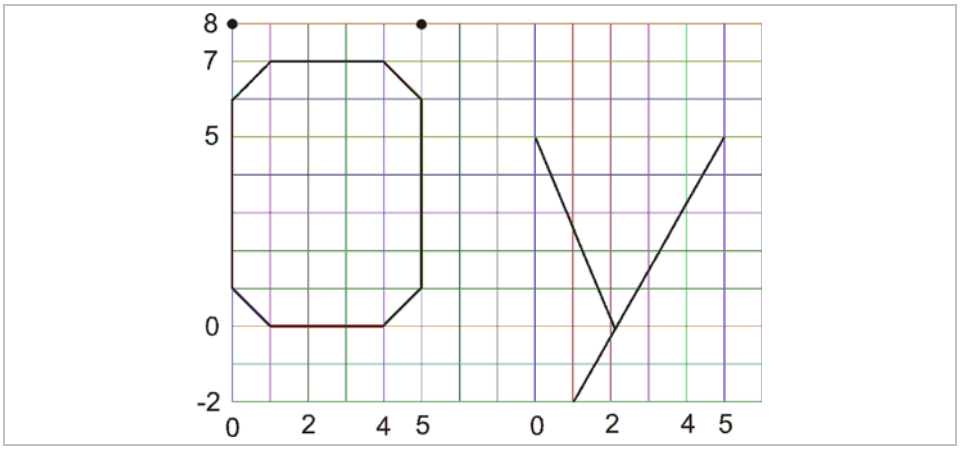
By default the software uses the font 'litt.chr' if no other font was selected.

Default font 'litt.chr' Fig. 10283

The 'litt.chr' consists of 96 characters. It contains the moving lines with the corresponding positions of the marking tools for all 96 characters. In addition each character contains the character height and broad of the grid. This is not the actually marked character height and broad, but the vertical and horizontal resolution of the character.

The default font has a vertical resolution of 7 steps. That is a letter is defined by a resolution of 7 steps, based on capital letters. Umlaut in capitalisation and special characters exceed the normal character height, lower case with descender such as g, p, q, y and special characters fall below the character height of 0.

This font is a proportionally font, i. e. the individual letters possess different character widths (e. g. a W is wider than an i). The following illustration clarifies the structure of the characters by the example of the Ö and y:



Structure of font 'litt.chr' Fig. 10293

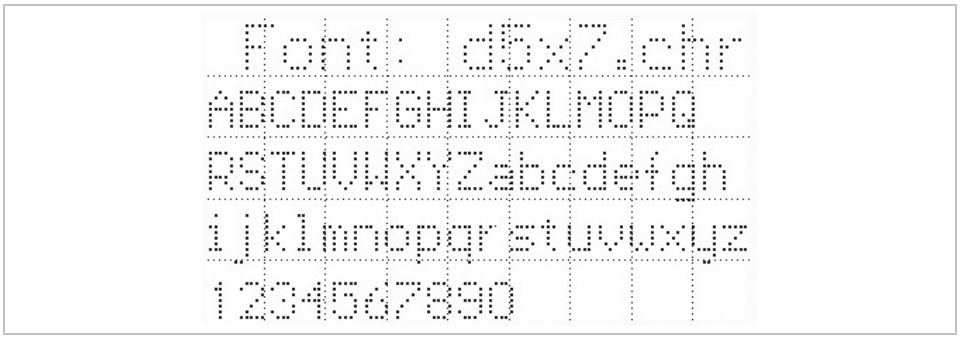
The default font results in a sufficiently good typeface despite the sharp-edged curves. The actual resolution of the marking depends on the resolution of the used marking head.

8.2 Further fonts

In addition to the default font 'litt.chr' 14 further fonts are available:

- bold.chr
- d5x7.chr: dot font.
- euro.chr
- goth.chr
- lcom.chr
- ocra.chr
- rlit.chr: Cyrillic font.
- rtri.chr: Cyrillic font.
- sans.chr
- scri.chr
- sima.chr
- simp.chr
- trip.chr
- tscr.chr

Font 'bold.chr' Fig. 10277



Font 'd5x7.chr' Fig. 10278

Font 'euro.chr' Fig. 10280

Font 'goth.chr' Fig. 10281

Font 'lcom.chr' Fig. 10282

Font 'ocra.chr' Fig. 10284

Font 'rlit.chr' Fig. 10285

Font 'rtri.chr' Fig. 10286

Font 'sans.chr' Fig. 10287

Font 'scri.chr' Fig. 10288

Font 'sima.chr' Fig. 10289

Font 'simp.chr' Fig. 10290

Font 'trip.chr' Fig. 10291

Font 'tscr.chr' Fig. 10292

Chapter 5

Maintenance

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1.2 Lubricants 5-3

2 Mechanical parts 5-4
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Exhaust air silencer 5-6
Toothed belts of the axes (Coining unit) 5-7
Slides of the axes (Coining unit) 5-9
Slides of the axes (Engraving unit) 5-10

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1 General Guidelines for maintenance

Note
Unprofessional usage of controls or marking head voids the warranty.

General guidelines for maintenance:

- With all adjustments, maintenance and repair works, the control must always be switched off and the marking unit must be separated from the power supply. For that purpose, pull the power supply plug before opening the unit. Exceptions of it, with which the unit must remain switched on during appropriate work, are noted in the maintenance instructions in each case.
- With work on pneumatics:
  - Turn off and lock the compressed air supply.
  - Wait at least 5 s after turning off the compressed air supply, until the pressure diminishes itself.
  - Examine whether the operating pressure dropped on 0 bar. Read off the current operating pressure from the appropriate manometer.

1.1 Maintenance overview

Operating hours	Maintenance place	Maintenance work	Page
40	Ventilation of the control	Check the air filter on dirt, clean or change it if necessary	5-5
40	Slides of the axes (coining unit)	Check the slides on smooth running	5-9
500	Slides of the axes (engraving unit)	Lubricate the lubricating nipple	5-10
1000	Ventilation of the control	Change the air filter	5-5
2000	Exhaust air silencer	Clean the silencer, change it if necessary	5-6
2000	Slides of the axes (engraving unit)	Change the automatic grease cartridge (option)	5-10
If necessary	Toothed belts of the axes (coining unit)	Check the toothed belts on wear Check the tension of the toothed belts	5-7
If necessary	Toothed belts of the axes (coining unit)	Change the toothed belts	5-8
If necessary	Slides of the axes (engraving unit)	Adjust the tightness	5-11
If necessary	Pneumatic maintenance unit	Adjust the oiler	5-15

Tab. 1

For single-shift operation:

Operating hours	Maintenance interval
40	Weekly
500	Every 3 months
1000	Every 6 months
2000	Annually

Tab. 2

1.2 Lubricants

Note
You can use also another lubricant, if this has verifiably the same characteristics. For example, the lubricant recommended here.

Maintenance place	Lubricant	ÖSTLING Art. number	Viscosity	Classification according to DIN 51825
Slides of the axes (Coining unit)	SF06	-	Class 0	KOG-20
Slides of the axes (Engraving unit)	SF06	-	Class 0	KOG-20
Pneumatic maintenance unit with oiler	Drawlub 28	45100111	k. A.	k. A.

Tab. 3

NADELPRÄGEN/RITZEN NADELPRÄGEN/RITZEN NADELPRÄGEN/RITZEN NADELPRÄGEN/RITZEN NADELPRÄGEN/RITZEN NADELPRÄGEN/RITZEN
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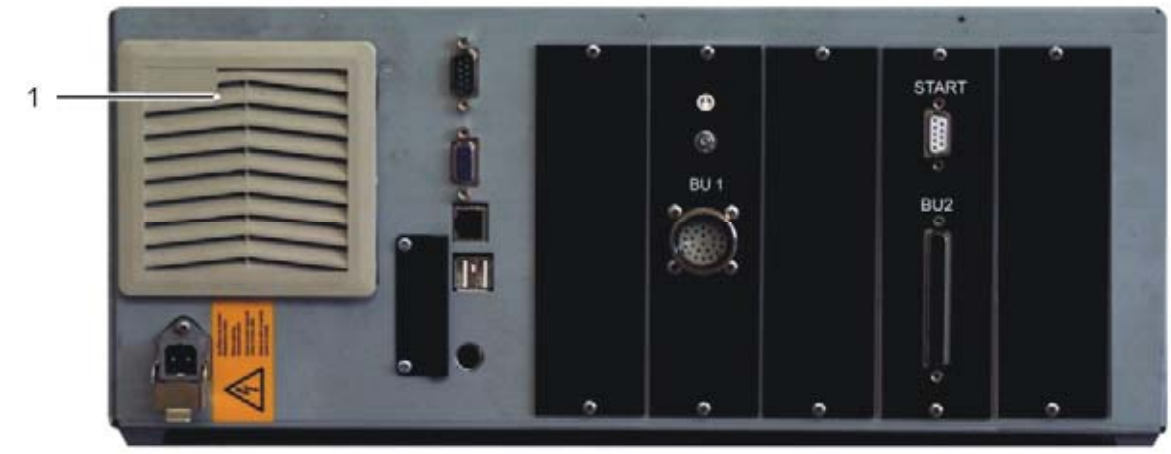
TAMPONDRUCK TAMPONDRUCK TAMPONDRUCK TAMPONDRUCK TAMPONDRUCK TAMPONDRUCK TAMPONDRUCK TAMPONDRUCK
INKJET INKJET INKJET INKJET INKJET INKJET INKJET INKJET INKJET INKJET INKJET INKJET INKJET INKJET INKJET INKJET

2 Mechanical parts

2.1 Maintenance overview



1 Ventilation

Control UMC 112 Fig. 10588

1 Toothed belts of the axes (only coining unit)
2 Slides of the axes
3 Exhaust air silencer

Marking head Fig. 10641

2.2 Maintenance instructions

Ventilation of the control

(see page 5-4)

Check the air filter

Every 40 operating hours.

1. Switch off the control and pull the power supply plug.
2. Open the cover of the ventilation.
3. Check the air filter on dirt.
4. If the air filter is dirty:
   - Remove the air filter and rinse it with warm water (max. 40 °C).

   or

   - Remove the air filter and suck it with an industrial vacuum cleaner.

   or

   - Remove air filter and beat it/shake it out.

   or

   - If the air filter is oily or fatty: dispose of it.
5. Insert the cleaned or new air filter.
6. Close the cover of the ventilation.

Change the air filter

Every 1000 operating hours; more frequent if the surroundings are very soiled.

1. Switch off the control and pull the power supply plug.
2. Open the cover of the ventilation.
3. Remove the air filter of the ventilation.
4. Insert new air filter.
5. Close the cover of the ventilation.

Exhaust air silencer

(see page 5-4)

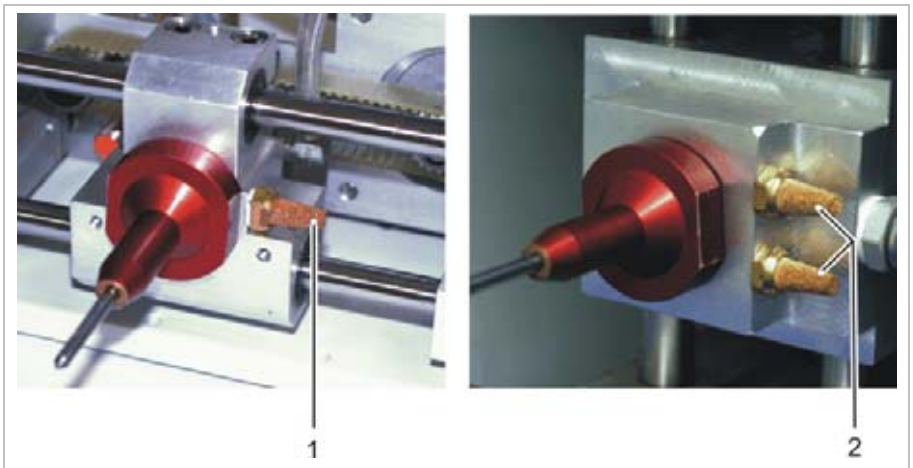
Clean the silencer

Every 2000 operating hours.

1. With table or built-in unit: move the marking head completely upward.

   or

   - With hand-held units: turn the marking head upside down.
2. Switch off the control and pull the power supply plug.
   Depending on the unit type the marking head has one or 2 silencers:



1 Silencer 2 2 silencers in engraving units

Marking head from the bottom Fig. 10194

3. Unscrew the silencer, wash it with warm water (max. 40 °C) and reassemble it.
4. If the silencer is very dirty: assemble a new silencer.

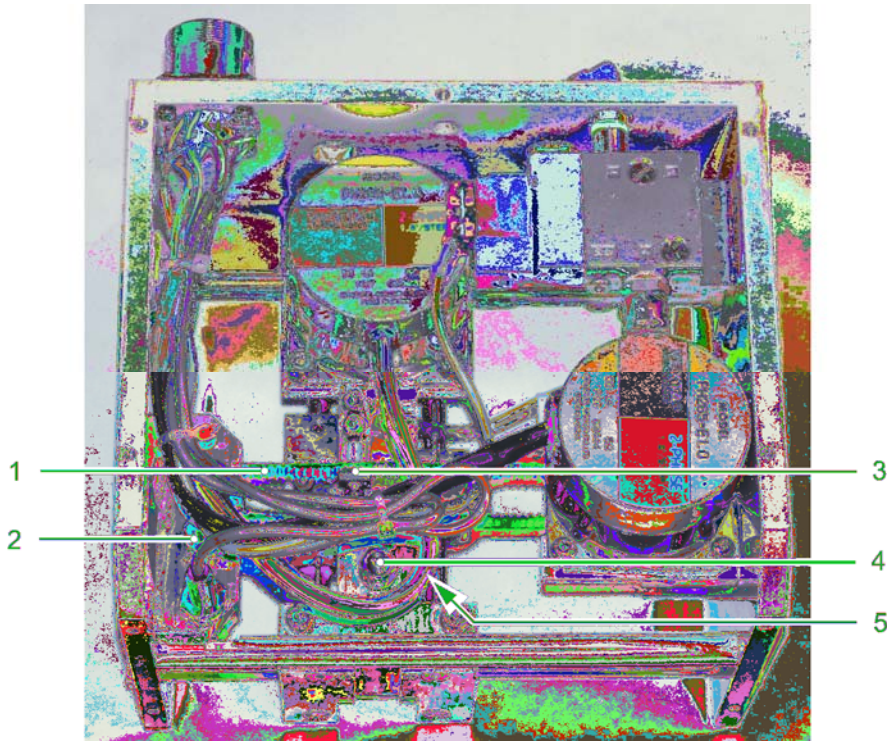
Toothed belts of the axes (Coining unit)

(see page 5-4)

Check the toothed belts

If necessary, i. e. if the slides (see page 5-9) are tight or with loss of quality of the marking.

1. Switch off the control and pull the power supply plug.
2. Unscrew the covering cap of the marking head.



1	Toothed belt of the X-axis	4	Eccentric screw for toothed belt of the Y-axis
2	Eccentric screw for toothed belt of the X-axis	5	Toothed belt of the Y-axis
3	Fastening toothed belt of the X-axis		

Marking head without covering cap Fig. 10195

3. Check the tension of the toothed belt.
   Toothed belt must sit tensely.

   Note
   Sometimes the toothed belt of the Y-axis is better accessible from down than from above. For that purpose turn the marking head upside down.

4. Check the toothed belt of the X- and Y-axis on wear.
   If the tension of the toothed belt is too low or a toothed belt is worn out, this toothed belt must be changed (see page 5-8).
5. Reassemble the covering cap of the marking head.

Change a toothed belt

If necessary, i. e. if the tension of the toothed belt is too low or a toothed belt is worn out.

1. Switch off the control and pull the power supply plug.
2. Unscrew the covering cap of the marking head.
3. Loosen the eccentric screw for toothed belt (2 or 4).
4. Loosen the fastening toothed belt (for X-axis: 3).
5. Remove old toothed belt.
6. Mount new toothed belt.
7. Fix the toothed belt with fastening toothed belt (for X-axis: 3).
8. Tighten the eccentric screw (2 or 4).
   Toothed belt must sit tensely.
9. Reassemble the covering cap of the marking head.

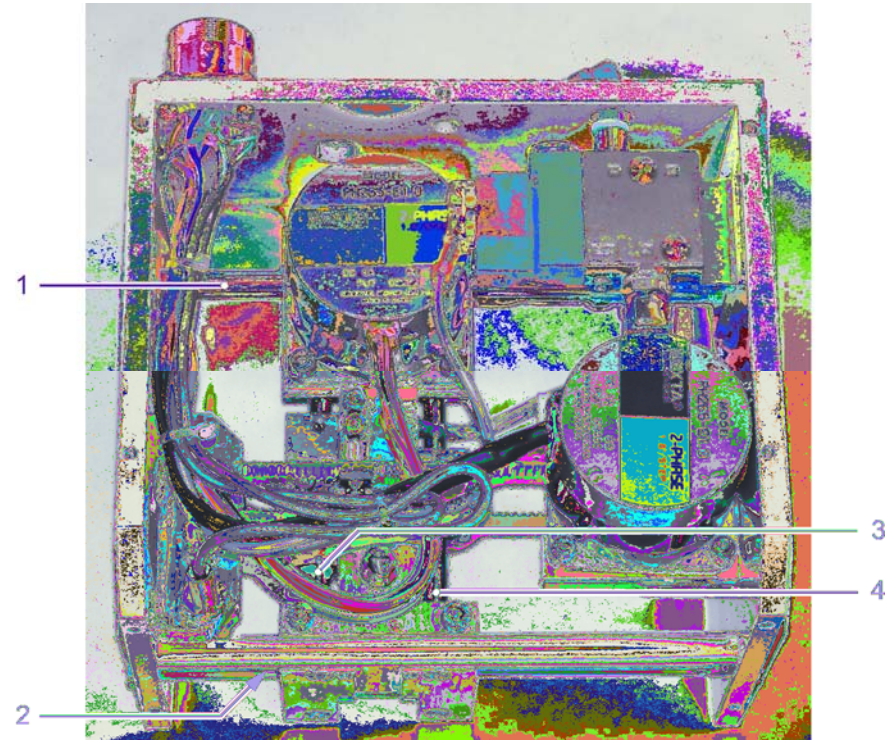
Slides of the axes (Coining unit)

(see page 5-4)

Check on smooth running

Every 40 operating hours.

1. Switch off the control.
2. Move the slides manually in X- and Y-direction.
   Slides must be movable easily by hand.
3. If the slides can be moved only with difficulty: lubricate the guiding rods of the axes:



1	Rear guiding rod of the X-axis	3	Left guiding rod of the Y-axis
2	Front guiding rod of the X-axis	4	Right guiding rod Y-axis

Marking head without covering cap Fig. 10191

Slides of the axes (Engraving unit)

(see page 5-4)

Lubricate the lubricating nipple

Every 500 operating hours; more frequent if the surroundings are very soiled.

1 Lubricating nipple

Housing of the marking head PinMark Fig. 10189

1. Switch off the control and pull the power supply plug.
2. Lubricate the lubricating nipple using a grease gun.

Change the grease cartridge (option)

Every 2000 operating hours.

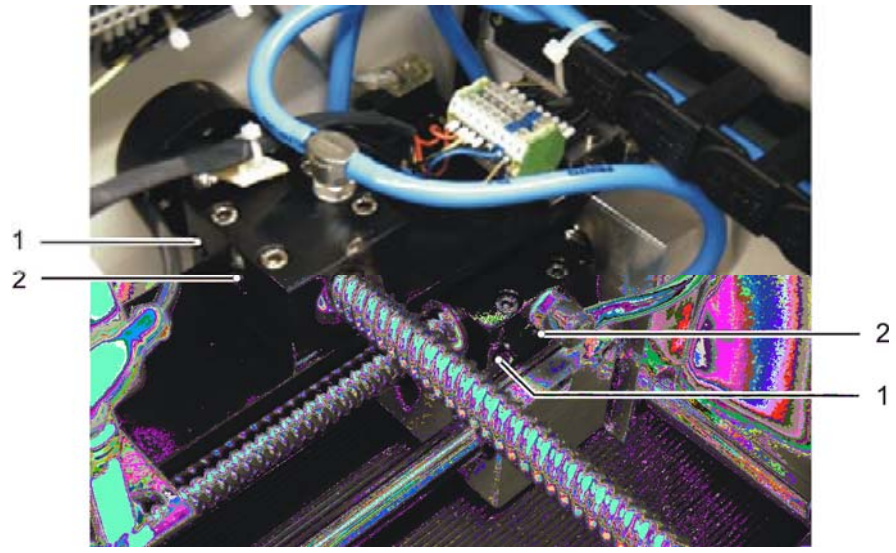
As an option, for the grease lubrication (see above), an automatic grease cartridge can be attached to the lubricating nipple. This fat cartridge contains 120 cm^3 grease and delivers it over the lubrication nipple to the unit during the adjusted dispensing time.

1. Switch off the control and pull the power supply plug.
2. Screw off the automatic lubricator.
3. Remove the old grease cartridge.
4. Remove the automatic lubricator from the transparent plastic cover.
5. Remove the old batteries from the lubricator.

6. Insert new batteries.
7. Set the desired dispensing time, vide label on lubricator.
8. Reinsert the lubricator into the transparent plastic cover.
9. Screw the new grease cartridge in the lubricator.
10. Screw the lubricator with grease cartridge on the engraving unit.
11. Turn the switch on the plastic cover to ON.

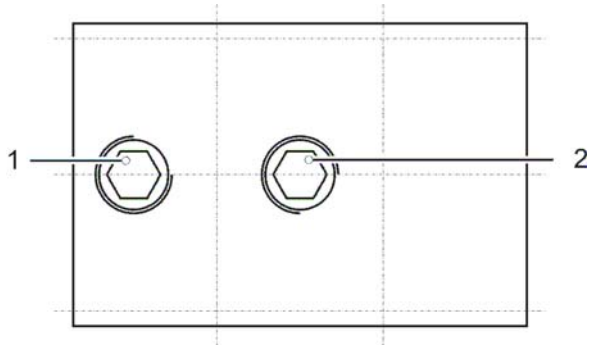
Adjust the nuts If necessary, i. e. if the lines produced by the marking head are no longer straight. One or both slides do not sit correctly and/or have too much clearance.

1. Switch off the control and pull the power supply plug.
2. Unscrew the covering cap of the marking head.
3. Push the slides of the axes completely to the left and/or to the rear:



1 Fastening screws 2 Adjustment screws

Slides of the axes Fig. 10190



1 Fastening screw 2 Adjustment screw

Detail: slide of one axis Fig. 10199

4. Tighten the fastening screw (1) of the relevant slide.
5. Move the slide manually.
   The slide mustn't be moved with more difficulty than before.
6. If the clearance of the bearing is too big although the fastening screw was tightened: screw in the adjustment screw (2) of the relevant slide.
7. Move the slide manually.
   The slide mustn't be moved with more difficulty than before.
8. Reassemble the covering cap of the marking head.

3 Pneumatic parts

3.1 Maintenance overview

1 Pneumatic maintenance unit

Fig. 10640

3.2 Maintenance instruction

Pneumatic maintenance unit

Note
2 different maintenance units are used at the PinMark marking units.

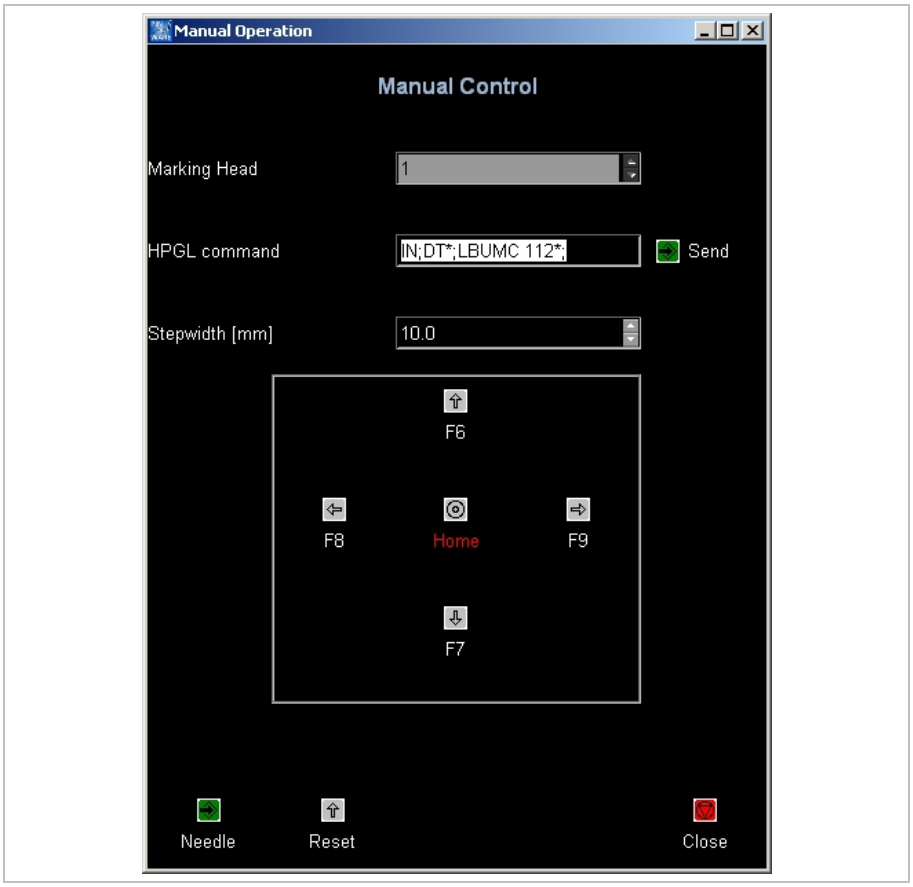
Use	Type of maintenance unit	FESTO type
All marking tools	Filter control valve with pressure reducer	Festo LFR 1/8 D-Mini
Marking tools WE 1 and/or WE 4 with hardened steel piston housing	Filter control valve with pressure reducer and oiler	Festo FRC 1/8 D-Mini, consisting of: • LFR 1/8 D-Mini. • LOE 1/8 D-Mini.

Tab. 4

For maintenance of the pneumatic parts please observe the operation manual of FESTO.

Set the oiler If necessary.

1. Do not switch off the control!
2. To switch on the needle in manual operation: select *System > Manual Control*.



Mask "Manual Control" Fig. 10553en

3. Select *Needle* to move the marking tool up and down once.
4. Adjust the oiler to approx. 1 drop per minute, see operation manual of FESTO.

Chapter 6

Communication

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Start marking 6-5
Load mask 6-6
Load text 6-7
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Loading a mask via PLC 6-9
Selecting the marking head via PLC 6-10
2 Inputs and outputs with special function 6-11

1 Communication and remote control

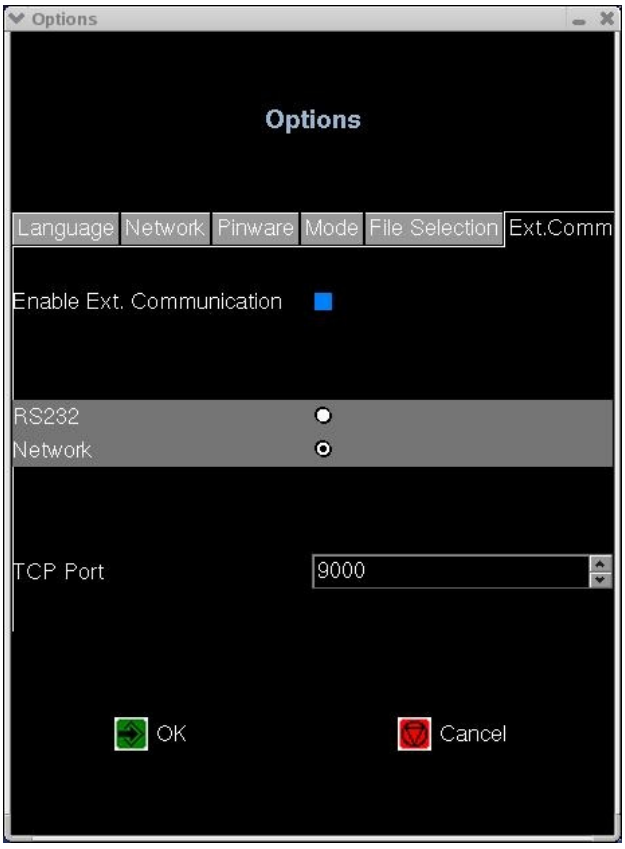
The Software of the UMC 112 offers various possibilities of communication with other devices and can even be completely controlled by an external device.

Optionally a communication via a PLC (programmable logic control) is possible. Via PLC masks and the marking head (when using 2 marking heads) can be selected.

1.1 Serial communication

Via the serial port RS232 data can be send to the control and the control can be remote controlled.

1. Select *System* > *Options*.
   "Options" appears.
2. Select "Ext. Comm.".



Mask "Options", tab "Ext. Comm." Fig. 10663en

3. To activate the function serial communication: select "Enable Ext. Communication".
4. Select the desired port (RS232 or network).
5. Enter the number of the used TCP port. Possible numbers: 1025 to 50000.
6. Select .

When the control is switched on the next time, the control is ready to mark until *Cancel* is selected or a start signal is given.

Parameter The serial port has the following parameters:

- Baud rate: 9600 Bits/s.
- 8 data bits.
- 1 stop bit.
- No parity.

General remarks A communication via the serial port is possible when the control is ready to mark. Therefore a started control can't be stopped via the serial port. I. e. a started marking can't be stopped via the serial port. After each change of the signal "Ready to mark", the control sends status data to the serial port.

If errors occur during data transfer, the communication can be reset by sending <Esc> (ASCII 27 or hexadecimal 1B).

The following paragraphs explain the different possibilities to remote control the control UMC 112. All received and send characters are listed in the tables in hexadecimal version (line HEX), decimal version (line DEC) and as ASCII-characters (line ASCII). In hexadecimal version a leading "0x" or the like is not shown.

Ready to mark

The "Ready to mark“ signal which is applied to the external connection of the BU2 socket is also output during each signal change of the output at the selected serial port. This means that, for example, this signal can be changed after each engraving process and the message "Ready to mark“ is transferred with the current status of the digital inputs of the first input card via the serial port.

In error-free operation the control sends the following:

	1. Byte	2. Byte	3. Byte	4. Byte	5. Byte	6. Byte	7. Byte	8. Byte
HEX	01h	50h	42h	06h	38h	30h	17h	04h
DEC	01	80	66	06	56	48	23	04
ASCII	SOH	'P'	'B'	ACK	'8'	'0'	ETB	EOT
	Start of header	Mark	Ready	Acknow-ledge	Incoming byte in hexadecimal for-mat		End of transfer-ed block	End of transfer

Tab. 1

Errors are sent in the case of the following events:

- "Ready to mark" was quit with <Esc>.
- E-STOP operated.
- Motors cannot be initialised.
- Error in calculating the mask.

In the event of an error the control sends the following:

	1. Byte	2. Byte	3. Byte	4. Byte	5. Byte	6. Byte	7. Byte	8. Byte
HEX	01h	45h	52h	06h	38h	30h	17h	04h
DEC	01	69	82	06	56	48	23	04
ASCII	SOH	'E'	'R'	ACK	'8'	'0'	ETB	EOT
	Start of header	Error	Error	Acknow-ledge	Incoming byte in hexadecimal for-mat		End of transfer-ed block	End of transfer

Tab. 2

Start marking

The marking process start can also be done via the serial port instead of through the hardware start input. It should be noted that this can only be done if the control is „Ready to mark“. The marking process cannot be stopped via the serial port.

To start the marking, the following data must be sent:

	1. Byte	2. Byte	3. Byte	4. Byte	5. Byte
HEX	01h	50h	53h	1Ah	04h
DEC	01	80	83	26	04
ASCII	SOH	'P'	'S'	SUB	EOT
	Start of header	Mark	Start	Substitute	End of transfer

Tab. 3

After error-free reception of the data the control sends the following:

	1. Byte	2. Byte	3. Byte	4. Byte	5. Byte
HEX	01h	50h	53h	06h	04h
DEC	01	80	83	06	04
ASCII	SOH	'P'	'S'	ACK	EOT
	Start of header	Mark	Start	Acknowledge	End of transfer

Tab. 4

Load mask

With this function a mask is called up via the serial port. The mask to be called must be already stored on the control. To load a mask, the following data must be sent:

	1. Byte	2. Byte	3. Byte	4. Byte	5. - 16. Byte	7. Byte	8. Byte
HEX	01h	4Dh	4Ch	1Ah	12 Bytes	17h	04h
DEC	01	77	76	26		23	04
ASCII	SOH	'M'	'L'	SUB	TEST .MSK	ETB	EOT
	Start of header	Mask	Laden	Substi-tute	File name of the mask e. g. 'Test.msk'	End of transfer-ed block	End of transfer

Tab. 5

Note
The file name must be filled with spaces up to 8 characters ahead of the point.

After error-free reception of the data the control sends the following:

	1. Byte	2. Byte	3. Byte	4. Byte	5. - 16. Byte	7. Byte	8. Byte
HEX	01h	4Dh	4Ch	06h	12 Bytes	17h	04h
DEC	01	77	76	06		23	04
ASCII	SOH	'M'	'L'	ACK	TEST .MSK	ETB	EOT
	Start of header	Mask	Laden	Acknow-ledge	File name of the mask e. g. 'Test.msk'	End of transfer-ed block	End of transfer

Tab. 6

Error If the mask isn't available, the control sends the following:

	1. Byte	2. Byte	3. Byte	4. Byte	5. - 16. Byte	7. Byte	8. Byte
HEX	01h	30h	35h	15h	12 Bytes	17h	04h
DEC	01	48	53	21		23	04
ASCII	SOH	'0'	'5'	NAK	TEST .MSK	ETB	EOT
	Start of header	Incoming byte in hexadecimal for-mat		No ack-nowledg ment	File name of the mask e. g. 'Test.msk'	End of transfer-ed block	End of transfer

Tab. 7

If the received header is defective, the control sends the following:

	1. Byte	2. Byte	3. Byte	4. Byte	5. - 16. Byte	7. Byte	8. Byte
HEX	01h	30h	31h	15h	12 Bytes	17h	04h
DEC	01	48	49	21		23	04
ASCII	SOH	'0'	'1'	NAK	TEST .MSK	ETB	EOT
	Start of header	Incoming byte in hexadecimal for-mat		No ack-nowledg ment	File name of the mask e. g. 'Test.msk'	End of transfer-ed block	End of transfer

Tab. 8

Load text

With this function, text fields are sent to the control via the serial port and inserted into the actual mask. After an error-free data transfer the control is "Ready to mark", the sent test can be marked.

To load a text field, the following data must be sent:

	1. Byte	2. Byte	3. Byte	4. Byte	5. Byte	6. Byte	7. Byte	8. Byte
HEX	01h	54h	44h	1Ah	30h	31h	17h	04h
DEC	01	84	68	26	48	49	23	04
ASCII	SOH	'T'	'D'	SUB	'0'	'1'	ETB	EOT
	Start of header	Text	Down-load	Substi-tute	No. of the text field, e. g. text field 01		End of transfer-ed block	End of transfer

Tab. 9

If the control has received the header and is "Ready to mark", it sends the following:

	1. Byte	2. Byte	3. Byte	4. Byte	5. Byte	6. Byte	7. Byte	8. Byte
HEX	01h	54h	44h	06h	30h	31h	17h	04h
DEC	01	84	68	06	48	49	23	04
ASCII	SOH	'T'	'D'	ACK	'0'	'1'	ETB	EOT
	Start of header	Text	Down-load	Acknow-ledge	No. of the text field, e. g. text field 01		End of transfer-ed block	End of transfer

Tab. 10

If the control has received the header and is not ready, it sends the following:

	1. Byte	2. Byte	3. Byte	4. Byte	5. Byte	6. Byte	7. Byte	8. Byte
HEX	01h	??h	??h	15h	30h	31h	17h	04h
DEC	01			21	48	49	23	04
ASCII	SOH	'E'	'R'	NAK	'0'	'1'	ETB	EOT
	Start of header	Error	Error	No ack-nowledg ment	No. of the text field, e. g. text field 01		End of transfer-ed block	End of transfer

Tab. 11

The superior control then sends the text of the text field:

	1. Byte	2. to n. Byte	n+1. Byte
HEX	02h		04h
DEC	02		04
ASCII	STX		EOT
	Start of text	desired text (max. 50 ASCII characters)	End of transfer

Tab. 12

The control sends back the received text:

	1. Byte	2. to n. Byte	n+1. Byte
HEX	02h		04h
DEC	02		04
ASCII	STX		EOT
	Start of text	Echo received text (max. 50 ASCII characters)	End of transfer

Tab. 13

The superior control sends a validation if the received text is equal to the sent text:

	1. Byte	2. to n. Byte	n+1. Byte
HEX	02h	06h	04h
DEC	02	06	04
ASCII	STX	ACK	EOT
	Start of text	Acknowledge	End of transfer

Tab. 14

The transfer is finished. Before further data can be sent, the signal "Ready to mark" must be active.

1.2 PLC operation (option)

Loading a mask via PLC

With this option one mask out of up to 127 masks (files with ending *.msk) can be selected and loaded via a PLC (programmable logic control).

The number of the mask is transferred binary coded. The order of the masks is determined in *System > Options* on the tab "File selection" (see chapter 4).

Conversion of binary numbers

Binary numbers can be simply converted into decimal numbers. The value of a binary number results from summating its digits that are previously multiplied with its place value 2^i:

Example: $[101]_2 = 1*2^2 + 0*2^1 + 1*2^0 = [5]_{10}$

$[1111110]_2 = 1*2^6 + 1*2^5 + 1*2^4 + 1*2^3 + 1*2^2 + 1*2^1 + 0*2^0 = [126]_{10}$

Process

The number of the mask to be loaded must be pending stably at the inputs E2.0 to E2.6 at least 100 ms before data transfer:

Mask to load	E2.6	E2.5	E2.4	E2.3	E2.2	E2.1	E2.0
1	0	0	0	0	0	0	1
2	0	0	0	0	0	1	0
3	0	0	0	0	0	1	1
4	0	0	0	0	1	0	0
5	0	0	0	0	1	0	1
...							
127	1	1	1	1	1	1	1

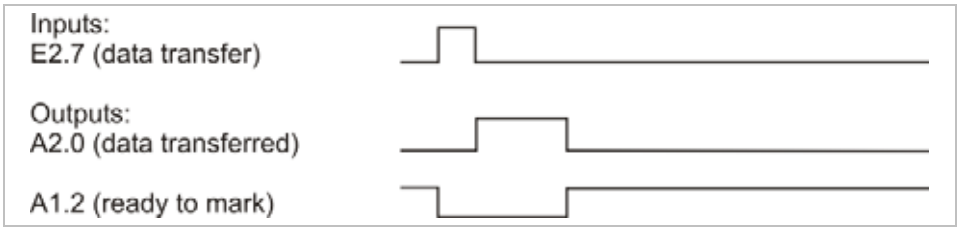
Tab. 15

If the data are pending stably the input E2.7 (data transfer) operates. For validation the control sets the output A2.0 (data transferred) until the selected mask is available for marking, but for at least 200 ms. If less masks are saved than the transferred number demands, the control sets the output A2.1 (error data transfer). This error is pending with A2.0 (data transferred), until it is acknowledged by pressing of any button at the control or by setting of the input E1.6 (acknowledge error).

Note

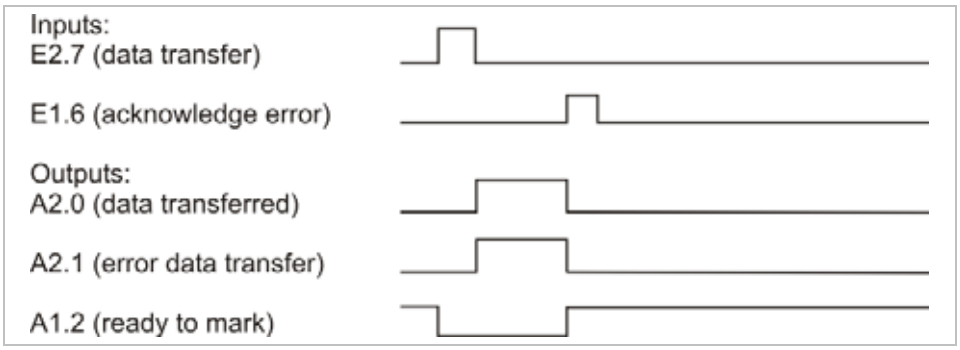
With the optional digit encoding switch number >127 are interpreted as 127. As hundreds you can only select 0 and 1.

Mask was loaded successfully:



Timing diagram mask loaded Fig. 10383en

Mask can't be loaded:



Timing diagram mask was not loaded Fig. 10384en

Selecting the marking head via PLC

If 2 marking heads are used with the control, the marking head to be used can be selected via the input E2.6:

- Marking with marking head 1: E2.6 = 0.
- Marking with marking head 2: E2.6 = 1.

If the marking head to be used is selected via the input E2.6, this input in not any longer available for loading masks. Therefore a mask can be selected only out of 63 masks ($1*2^5 + 1*2^4 + 1*2^3 + 1*2^2 + 1*2^1 + 1*2^0 = 63$).

2 Inputs and outputs with special function

In-/output	Name	Remark
E1.4	option Z-axis	home position
E1.6	acknowledge error	A pending error can be acknowledged via this input. This is suited for coining units that are completely controlled from extern, e. g. to acknowledge an E-STOP.
E1.7	E-STOP	Pushbutton E-STOP must be an opener and must be connected with +24 V DC (Pin 12, 13, 14, 31 or 32 on BU2) and E1.7 (Pin 19 on BU2). If no pushbutton E-STOP is used a jumper must be used between +24 V DC (Pin 12, 13, 14, 31 or 32 on BU2) and E1.7 (Pin 19 on BU2). If E-STOP is recognised, the motors can't drive or the needle can't be set. "E-STOP recognised" appears on the display. 1. Eliminate the cause of the E-STOP. 2. Press any button or set the input E1.6.
A1.1	PinMark marks	During a marking, this output is switched to +24 V DC. Otherwise 0 V DC.
A1.2	PinMark ready to mark	When PinMark waits for the start signal of a marking, this output is switched to +24 V DC. Otherwise 0 V DC.
A1.3	option Z-axis	marking position
A1.4	ready for operation	After the controls has booted and referenced without errors, this output is switched to +24 V DC. In cause of faults or E-STOP, this output is switched to 0 V DC.

Tab. 16

Chapter 7

Connector pin lists

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1 Marking head

1.1 Plug to UMC 112

The plug for the connection of the marking head to the control UMC 112 has 21 pins.

Pin		Axis	Colour of the cable	Name	Remark
1	A	X	pink	motor X-axis: phase 2A	
2	B	X	black	motor X-axis: phase 1A	
3	C	X	blue	motor X-axis: phase 2B	
4	D	X	green	motor X-axis: phase 1B	
5	E	Y	pink	motor Y-axis: phase 2A	
6	F	Y	black	motor Y-axis: phase 1A	
7	G	Y	blue	motor Y-axis: phase 2B	
8	H	Y	green	motor Y-axis: phase 1B	
9	I			reserved	
10	K			reserved	
11	L			reserved	
12	M		black	foot switch - E1.0	option
13	N	X	black	limit switch output X - E1.1	
14	P	Y	black	limit switch output Y - E1.2	
15	R		black	output needle valve - A1.0	
16	S	X	brown	+24 V - limit switch X	
17	T	Y	brown	+24 V - limit switch Y	
18	U		brown	+24 V - foot switch	option
19	V	X	blue	0 V - limit switch X	
20	W	Y	blue	0 V - limit switch Y	
21	X		black	0 V - needle valve	

Tab. 1

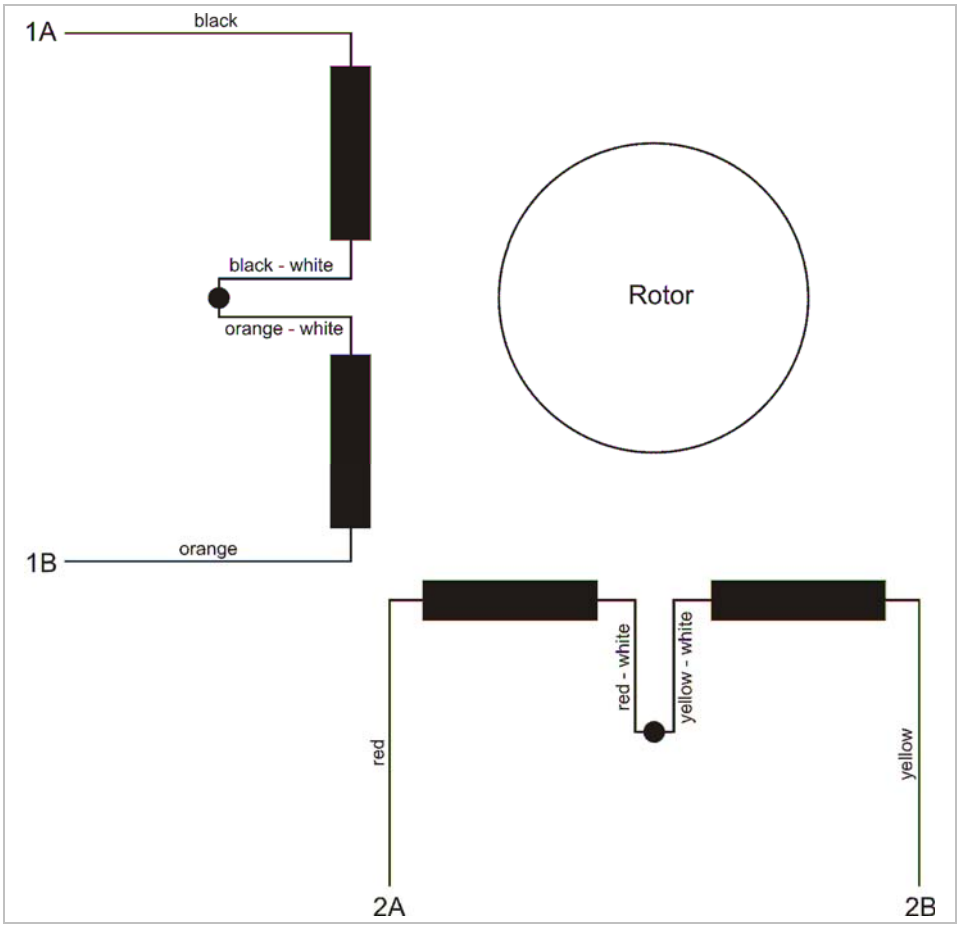
1.2 Stepping motors

Colour coding

Phase	Colour of the cable	Phase	Colour of the cable
Phase 1A	black	Phase 2A	red
Phase 1B	orange	Phase 2B	yellow
Jumper 1	black - white/ orange -white	Jumper 2	red - white/ yellow - white

Tab. 2

Circuit



Circuit of the stepping motors Fig. 10377en

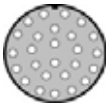
2 Control UMC 112

Back side of the control UMC 112 Fig. 10635

Note
Depending on the configuration of the control, there is the socket BU5 (connection Z-axis) instead of the socket BU4 (connection rotation axis) or the socket BUX (in- and outputs at your disposal) instead of the socket BU3 (external file selection).

Note
The sockets profibus PB, BU4 or BU5 and BU3 or BUX are optional.

2.1 Socket BU1 to marking head



The plug BU1 for the connection of the marking head to the control has 26 pins.

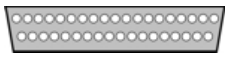
Pin	Name	Remark
1	motor X-axis: phase 2A	
2	motor X-axis: phase 1A	
3	motor X-axis: phase 2B	
4	motor X-axis: phase 1B	
5	motor Y-axis: phase 2A	
6	motor Y-axis: phase 1A	
7	motor Y-axis: phase 2B	
8	motor Y-axis: phase 1B	
9	reserved	
10	reserved	
11	reserved	
12	foot switch start E1.0	digital input
13	limit switch X	digital input
14	limit switch Y	digital input
15	output needle valve - A1.0	
16	+24 V DC internal	
17	+24 V DC internal	
18	+24 V DC internal	
19	GND	0V DC
20	GND	0V DC
21	GND	0V DC
22	motor Z-axis: phase 2A	only with option Z-axis
23	motor Z-axis: phase 1A	only with option Z-axis
24	motor Z-axis: phase 2B	only with option Z-axis
25	motor Z-axis: phase 1B	only with option Z-axis
26	reserved	

Tab. 3

Phase	Colour of the cable	Phase	Colour of the cable
Phase 1A	black	Phase 2A	red
Phase 1B	orange	Phase 2B	yellow
Jumper 1	black - white/ orange -white	Jumper 2	red - white/ yellow - white

Tab. 4

2.2 Socket BU2

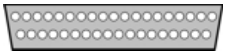


The socket BU2 for standard digital I/O communication has 37 pins. With this connection the current status of the marking head can be queried or releases can be sent.

The high level of the input signals is defined between 17 -30 V DC, the high level for output signals will be 24 V DC. The maximum current you can take from all output signal together is 0.5 A.

Pin	Signal	Name	Remark
1	A1.0	needle valve	is used internally
2	A1.1	PinMark is marking	
3	A1.2	PinMark ready to mark	
4	A1.3	reserved	option Z-axis
5	A1.4	ready for operation	output closed = ready for operation
6	A1.5	stop signal	for option "stop after each line"
7	A1.6	data transfer finished	can be set via the serial port
8	A1.7	power supply is switched	is used internally
9	GND	GND for 24 V DC	
10	GND	GND for 24 V DC	
11	GND	GND for 24 V DC	
12	+24 V DC	+24 V DC	internal voltage
13	+24 V DC	+24 V DC	internal voltage
14	+24 V DC	+24 V DC	internal voltage
15		not used	
16	E1.1	reserved	max. 25 V DC
17	E1.3	reserved	option Z-axis (marking position), max. 25 V DC
18	E1.5	reserved	option type plate, max. 25 V DC
19	E1.7	E-STOP	E-STOP active, if E1.7 = 0 V
20		not used	
21		not used	
22		not used	
23		not used	
24		not used	
25		not used	
26		not used	
27		not used	
28	GND	GND for 24 V DC	
29	GND	GND for 24 V DC	
30	GND	GND for 24 V DC	
31	+24 V DC	+24 V DC	internal voltage
32	+24 V DC	+24 V DC	internal voltage
33		not used	
34	E1.0	foot switch start	max. 25 V DC
35	E1.2	reserved	max. 25 V DC
36	E1.4	reserved	option Z-axis (home position), max. +25 V DC
37	E1.6	acknowledge error	max. 25 V DC

2.3 Socket BU3

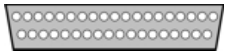


The socket BU3 for external file selection has 37 pins. This socket is optional.

Pin	Signal	Name	Remark
1	A2.0	data transferred	Signal is pending at least for 200 ms after data transfer
2	A2.1	error data transfer	selected file not available
3	A2.2	reserved	switches +24 V DC internally
4	A2.3	reserved	switches +24 V DC internally
5	A2.4	reserved	switches +24 V DC internally
6	A2.5	reserved	switches +24 V DC internally
7	A2.6	reserved	switches +24 V DC internally
8	A2.7	reserved	option second needle, operates second needle valve
9	GND	GND for 24 V DC	
10	GND	GND for 24 V DC	
11	GND	GND for 24 V DC	
12	+24 V DC	+24 V DC	internal voltage
13	+24 V DC	+24 V DC	internal voltage
14	+24 V DC	+24 V DC	internal voltage
15		not used	
16	E2.1	file selection bit 1	max. +25 V DC
17	E2.3	file selection bit 3	max. +25 V DC
18	E2.5	file selection bit 5	max. +25 V DC
19	E2.7	data are pending stably	max. +25 V DC
20		not used	
21		not used	
22		not used	
23		not used	
24		not used	
25		not used	
26		not used	
27		not used	
28	GND	GND for 24 V DC	
29	GND	GND for 24 V DC	
30	GND	GND for 24 V DC	
31	+24 V DC	+24 V DC	internal voltage
32	+24 V DC	+24 V DC	internal voltage
33		not used	
34	E2.0	file selection bit 0 (LSB)	max. +25 V DC
35	E2.2	file selection bit 2	max. +25 V DC
36	E2.4	file selection bit 4	max. +25 V DC
37	E2.6	file selection bit 6 (MSB)	max. +25 V DC

Tab. 6

2.4 Socket BUX

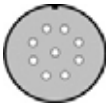


The socket BUX has 37 pins. Its in- and outputs are at your disposal. This socket is optional.

Pin	Signal	Name	Remark
1	E3.0		
2	E3.2		
3	E3.4		
4	E3.6		
5	E4.0		
6	E4.2		
7	E4.4		
8	E4.6		
9	+24 V DC		
10	GND	GND for 24 V DC	
11	A3.0		
12	A3.2		
13	A3.4		
14	A3.6		
15	A4.0		
16	A4.2		
17	A4.4		
18	A4.6		
19		not used	
20	E3.1		
21	E3.3		
22	E3.5		
23	E3.7		
24	E4.1		
25	E4.3		
26	E4.5		
27	E4.7		
28	+24 V DC		
29	GND	GND for 24 V DC	
30	A3.1		
31	A3.3		
32	A3.5		
33	A3.7		
34	A4.1		
35	A4.3		
36	A4.5		
37	A4.7		

Tab. 7

2.5 Socket BU4

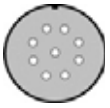


The socket BU4 for the connection of a rotation axis has 9 pins. This socket is optional.

Pin	Name	Remark
1	motor rotation axis: phase 2A	
2	motor rotation axis: phase 1A	
3	motor rotation axis: phase 2B	
4	motor rotation axis: phase 1B	
5	limit switch +24 V DC	
6	limit switch GND	0 V DC
7	limit switch rotation output	digital input
8	reserved	
9	reserved	

Tab. 8

2.6 Socket BU5

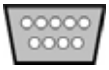


The socket BU5 for the connection of a Z-axis has 9 pins. This socket is optional.

Pin	Name	Remark
1	motor Z-axis: phase 2A	
2	motor Z-axis: phase 1A	
3	motor Z-axis: phase 2B	
4	motor Z-axis: phase 1B	
5	limit switch +24 V DC	
6	limit switch GND	0 V DC
7	limit switch Z output	digital input
8	reserved	
9	reserved	

Tab. 9

2.7 Socket START

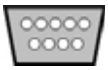


The socket START for the connection of a foot switch has 9 pins. The marking can be started by foot switch.

Pin	Signal	Name	Remark
1	GND	GND 24 V DC	
2		reserved	do not use
3		reserved	do not use
4		reserved	do not use
5		reserved	do not use
6	+24 V DC	+24 V DC	internal voltage
7	E1.0	foot switch start	max. +25 V DC
8		reserved	do not use
9		reserved	do not use

Tab. 10

2.8 Profibus PB



The socket profibus PB is optional. As default, the station address 11 is set. The address of the profibus ca be changed via Pinware and Software, if necessary also via the bus itself.

- To include the I/O module into the profibus PB: install the delivered GSD file on the master.

The inputs and outputs correspond to the inputs and outputs of the connections BU2 und BU3 (option):

In-/output	Name	Remark
E1.0	foot switch start	
E1.1	reserved	
E1.2	reserved	
E1.3	reserved	
E1.4	reserved	
E1.5	reserved	
E1.6	acknowledge error	
E1.7	E-STOP	E-STOP active, if E1.7 = 0 V
A1.0	needle valve	is used internally
A1.1	PinMark is marking	
A1.2	PinMark ready to mark	
A1.3	reserved	
A1.4	ready for operation	output closed = ready for operation
A1.5	reserved	
A1.6	reserved	
A1.7	reserved	

Tab. 11

Socket profibus PB:

	Signal	Name	Remark
1		reserved	
2		reserved	
3	B	red	
4	RTS		
5	GND		
6	5 V		
7		reserved	
8	A	green	
9		reserved	

Tab. 12

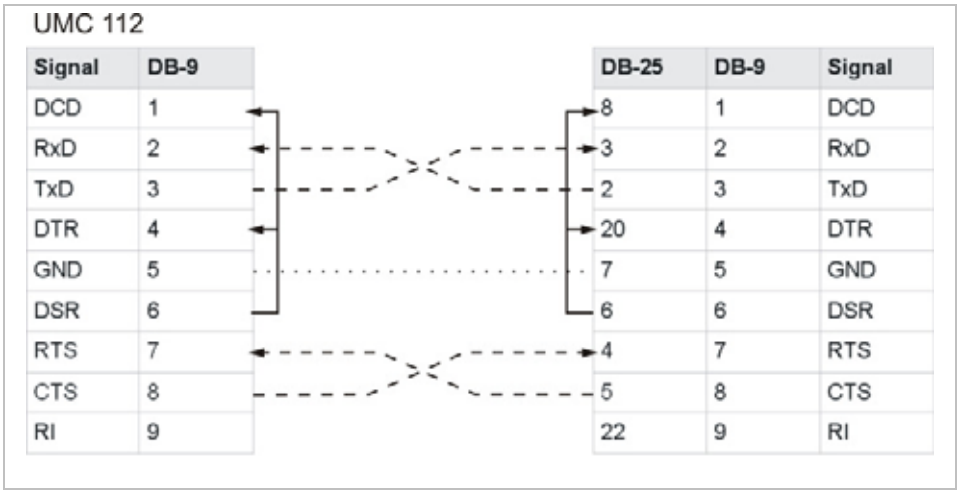
3 Connection cable for marking head

Pin		Colour of the cable	Name	Remark
1	A	white	motor X-axis: phase 2A	
2	B	brown	motor X-axis: phase 1A	
3	C	green	motor X-axis: phase 2B	
4	D	yellow	motor X-axis: phase 1B	
5	E	pink	motor Y-axis: phase 2A	
6	F	grey	motor Y-axis: phase 1A	
7	G	blue	motor Y-axis: phase 2B	
8	H	red	motor Y-axis: phase 1B	
9	I	black	reserved	
10	K	purple	reserved	
11	L	pink - grey	reserved	
12	M	red - blue	foot switch - E1.0	option
13	N	green - white	limit switch output X - E1.1	
14	P	green - brown	limit switch output Y - E1.2	
15	R	yellow - white	output needle valve - A1.0	
16	S	yellow - brown	+24 V	
17	T	white - grey	+24 V	
18	U	brown - grey	+24 V	
19	V	pink - white	0 V	
20	W	pink - brown	0 V	
21	X	red - white	0 V	
22	Y	-	motor Z-axis: phase 2A	option
23	Z	-	motor Z-axis: phase 1A	option
24	-	-	motor Z-axis: phase 2B	option
25	-	-	motor Z-axis: phase 1B	option
26	-	-	reserved	

Tab. 13

NADELPRÄGEN/RITZEN NADELPRÄGEN/RITZEN NADELPRÄGEN/RITZEN NADELPRÄGEN/RITZEN NADELPRÄGEN/RITZEN NADELPRÄGEN/RITZEN
ELEKTROLYTISCH ELEKTROLYTISCH ELEKTROLYTISCH ELEKTROLYTISCH ELEKTROLYTISCH ELEKTROLYTISCH ELEKTROLYTISCH
LASERMARKIERUNG LASERMARKIERUNG LASERMARKIERUNG LASERMARKIERUNG LASERMARKIERUNG LASERMARKIERUNG LASERMARKIERUNG
VISION SYSTEME VISION SYSTEME VISION SYSTEME VISION SYSTEME VISION SYSTEME VISION SYSTEME VISION SYSTEME
TAMPONDRUCK TAMPONDRUCK TAMPONDRUCK TAMPONDRUCK TAMPONDRUCK TAMPONDRUCK TAMPONDRUCK
INKJET INKJET INKJET INKJET INKJET INKJET INKJET INKJET INKJET INKJET INKJET INKJET INKJET INKJET INKJET

4 Serial port RS232



Serial communication with hardware handshake Fig. 10378

Signal name	Name	Description
DCD	data carrier detected	data carrier detected
RxD	receive data	data received
TxD	transmit data	data transferred
DTR	data terminal ready	data terminal ready
GND	signal ground	GND
DSR	data set ready	ready for operation
RTS	request to send	request to send
CTS	clear to send	clear to send
RI	receiver interrupt	receiver interrupt

Tab. 14

To do the serial communication without hardware handshake (3 circuit cables RTS and CTS), the RTS and CTS signals must be linked in the plug of the external communication partner (not necessary in the UMC 112):

- with DB-9: Pin 7 with Pin 8.
- with DB-25: Pin 4 with Pin 5.

5 Engraving unit (option)

5.1 Pin list terminal strip

Socket multi pin	Terminal	No. terminal/ destination	Name	Remark
Pin	19		green - yellow, GND Y slide	
1	1	motor X-axis	red, phase 2A	
2	2	motor X-axis	orange, phase 1B	
3	3	motor X-axis	yellow, phase 2B	
4	4	motor X-axis	black, phase 1A	
5	5	1	motor Y-axis	
6	6	2	motor Y-axis	
7	7	3	motor Y-axis	
8	8	4	motor Y-axis	
	9	foot switch	reserve - E1.0	
13	10	limit switch X	limit switch output X - E1.1	
14	11	5	limit switch output Y - E1.2	
15	12	needle valve	output needle valve - A1.0	
16	13	limit switch X	brown, +24 V DC - limit switch X	
17	14	7	brown, +24 V DC - limit switch Y	
18	20		reserved	
19	15	limit switch X	blue, 0 V - Limit switch X	
20	16	6	blue, 0 V - Limit switch Y	
21	17	needle valve	0 V - magnet valve needle	
	18	8	reserved	

Tab. 15

Terminal strip on slide

Cable	Terminal	Name	Remark
1	1	motor Y-axis, red, phase 2A	
2	2	motor Y-axis, orange, phase 1B	
3	3	motor Y-axis, yellow, phase 2B	
4	4	motor Y-axis, black, phase 1A	
5	5	limit switch output Y - E1.2	
6	6	limit switch Y,	
7	7	limit switch Y, brown, +24 V DC - limit switch Y	
8	8	reserved	
9	9		

Tab. 16

Phase	Colour of the cable	Phase	Colour of the cable
Phase 1A	black	Phase 2A	red
Phase 1B	orange	Phase 2B	yellow
Jumper 1	black - white/ orange -white	Jumper 2	red - white/ yellow - white

Tab. 17

Chapter 8

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Chapter 9

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Chapter 10

EU conformity explanation

EC conformity declaration

in terms of EC directives

- Machines 98/37/EG
- Electromagnetic compatibility 89/336/EWG
- Low voltage 73/23/EWG

Hereby we declare that the below designated machine corresponds to the fundamental safety and health requirements of the mentioned EC directives machines in its conceiving and design as well as in the execution brought in circulation by us. In the case of a change of the machine not co-ordinated with us this declaration loses its validity.

Plant/Machine

Make:	PinMark needle marking system
Type:	3/5 - 4/6 - 5/9 - 8/14 - 15/20 - 15/30
Machine nr:	
Year:	as of 2006

Manufacturer

ÖSTLING Markiersysteme GmbH
Broßhauser Str. 27
42697 Solingen
Deutschland

The following harmonized standards were us:

- DIN EN 60204-1
- DIN EN 50081-1
- DIN EN 50082-1
- DIN EN 60947
- DIN EN 60439
- DIN EN ISO 12100-1
- DIN EN ISO 12100-2
- DIN EN 62061
- DIN EN 61508
- DIN EN 983

Following national standards, guidelines and specifications were used:

- VDE 0100
- VDE 0105 part 1 + 2
- VDE 0113 part 2 + 3

A technical documentation is completely present.
The manual belonging to the plant/machine is present.

☐ in original version and
☒ in the national language of the user: english

Solingen,	12.04.2006	Rolf Östling, Geschäftsführer	
Ort	Datum	Unterzeichner und Angaben zum Unterzeichner	Unterschrift

Chapter 11

Request for service

Request for service

of company

Östling Markiersysteme GmbH
Broßhauser Straße 27
42697 Solingen
Tel: 0212 / 2696 - 0
Fax: 0212 / 2696 - 199

Billing address:

Location of machine (if different to above):

Gewährleistung ☐
Kulanz ☐
Rechnung ☐
interne AB: _____
Termin: _____
Monteur: _____
Erledigt: _____
(is completed by ÖSTLING !)

Contact: _____ **Department:** _____ **Date:** _____

Phone no.: _____ **Fax no.:** _____ **Order no.:** _____

Request for

☐**Installation** ☐**Maintenance** ☐**Repair** ☐**Training** ☐_____

of

Machine:

Laser	☐	Type: _____
Pinmarker	☐	
Scraper	☐	Machine no.: _____
Electrolytic	☐	
Pad printer	☐	Controller no.: _____
Ink Mark	☐	
		Year of manufacture: _____

Short description of problem:

_____

_____

_____

_____

_____

Please enclose the completed and signed maintenance protocols!

Other:

_____

Signature and company stamp: _____

ÖSTLING - worldwide

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