Before installing and using this machine, you must read this user guide carefully. Keep it in a safe place, in case you need to refer to it later.
This manual should not be used without the CN 97 program manual - B2241 701
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**TYPE OF MACHINE:** IS900 IQ+ Electronic Engraving Machine  
**MANUFACTURER:** GRAVOTECH MARKING SAS  
BP 15 - Z.I. - 10600 LA CHAPELLE SAINT LUC - FRANCE

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Information about regulations

Conformity standards
This hardware was designed and build in conformity with the relevant EC marking and EEC directives:
- "Low Voltage" Directive 2006/95/EC

The modification or transformation of this equipment, the adaptation and installation of accessories not recommended by GRAVOTECH MARKING SAS, the installation of this equipment in a manufacturing process, the piloting by a robot, the connection to an external automaton, modify the characteristics of this material and can make it not compliant with the European Directives it is subjected. These modifications voids the responsibility of the manufacturer.
In this case, the person who fits the machine and the equipment is responsible for the EC compliance of the final work station.

Electrical security
This hardware complies with standards EN 60204-1 and EN 60950-1, which also refer to the LASER system safety standard CEI 825-1 (08/2001).
The different fuses of the machine comply with the IEC 127-2 norm (International Electric Committee).
The different security levels the input/output answer are indicated for each connector in the chapter «Rear view of the machine». Two security levels are possible:
- Dangerous voltage (power supply, accessories, plugs ...).
- Very low security voltage.

Machine security
This hardware is in conformity with the norm EN ISO12100-1 and EN ISO12100-2.

Electromagnetic compatibility
This hardware is in conformity with electromagnetic compatibility norms:
- EN 55022 - classe B ; EN 61000-3-2 ; EN 61000-3-3 (emission in residential, commercial, and light industrial environment)
- EN 61000-6-2 (immunity in industrial environment)
All the cables used with this hardware must be in conformity with the electronic compatibility standards, norm EN 55022 - class B.

Electrical security
This material is «class 1». The mains plug MUST always be connected to a neutral socket and comply with the regulations in force in the country of installation. If you do not have a plug of this type, have one installed by an approved electrician. Under no circumstances should you depart from this instruction.
The manufacturer bears no responsibility towards any user where alterations have been carried out contrary to the manufacturer's specifications, notably with respect to electrical/electronic elements.

Any operation, other than those mentioned here, must only be carried out by an approved Gravograph technician. Do not take the machine apart to repair or clean it: this will void your guarantee.

This symbol indicates that once this equipment has reached the end of its useful life, it must not be disposed of with non-sorted municipal waste, in accordance with the European Directive 2002/96/EC.
The equipment must be disposed of at an appropriate collection point for processing, sorting, and recycling of Waste Electrical and Electronic Equipment (DEEEE).
The elements which compose Electrical and Electronic Equipment may contain substances which have harmful effects on the environment or on human health.
By following these instructions, you are helping the environment, contributing to the preservation of our natural resources, and protecting human health.
Presentation

Introduction

Thank you for purchasing the IS900 IQ+ machine. Years of testing and refinements have made this unit the ultimate engraving and cutting system.

Thanks to its innovative design with:

- the IQ+ (Intelligence Quotient +) concept, which offers, inter alia, significantly improved displacement speeds and a faster communication machine/PC,
- the RDF function (Profile Follow-up) which once activated calculates and adjusts automatically the position of the tool holder for the engraving of plates which are not plane,
- an integrated electronics box easily interchangeable,

and with its performance results (speed, power and engraving areas), the IS900 IQ+ machine combines flexibility and full featured performance without sacrificing simplicity, ease of use, or ease of maintenance.

Using advanced engineering and design features, the IS900 IQ+ machine is truly one-of-a-kind.

To begin with, we highly recommend that this entire manual be read before attempting to use the LASER system. The manual includes important information about safety, assembly, use, and maintenance.

The machine must never be handled without an adult present. Keep the machine, wires and cables out of children’s reach.

The IS900 IQ+ engraving machine is a high performance machine:

All dispositions contributing to the safety of use must imperatively be respected.

Contra-indications

This machine is only designed for engraving, drilling, milling and cutting purposes and must never be used for other applications.

To use this machine, you are advised to wear protective glasses against the chips ejections.

Do not use this machine for working with wood.

Do not use this machine in explosive environment.

This machine is only designed for one user. Do not let several people use the machine simultaneously.

- If the machine is not to be used for a long period, unplug the electricity supply and cover the machine (packaging, cover, lid...)
- Do not move the engraving head by hand unless mechanical block of the machine as described in the paragraph "Mechanical block" of this manual's "Installing" chapter.
- Do not spill any liquids onto the machine (drinks, cleaning fluids...) unless when recommended by GRAVOTECH MARKING SAS (example: lubrication).
- Do not place any object on the machine other than that to be engraved.
- The machine should never be used with anything other than Gravograph accessories and tools.
- Never hold the material to be engraved in your hands. Only use the GRAVOGRAPH clamping systems designed for your machine.
- Make sure that the material is well clamped before starting to engrave.
- During engraving, do not use this machine without a nose (depth regulating nose or vacuum nose) ou carter d'aspiration muni d'une brosse (broche H.F.) in order to avoid projections of swarf.
- Do not take the engraving material out of the machine during engraving.
- If the engraving must be stopped, use the function key provided for this purpose on the keyboard of the machine.

To avoid any risks of being crushed by the machine during engraving, do not stand near the tools (the travel area of the tool is 25.9” x 17.6” - 635x432mm).

Do not lean over the spindle holder.

Ensure that no one is in the travelling area of the moving parts of the machine and that no object will obstruct the travelling of the moving parts.
This sign shown on the tool-holder of the machine shows the danger caused by the rotating spindle during engraving (risks of getting burnt or cut).

To avoid any risks of getting burnt, the protective housing (E) of the machine must be always closed, except when carrying out adjustments (if not the machine remains in pause).

As long as the protective housing (E) of the machine is opened, the machine remains in pause. Do not never bypass this safety.
When the spindle motor is in rotation, the red LED (J3) is lit.

CAUTION - LASER RADIATION (pict)
Do not stare into beam
Laser diode - Wavelength: 630-680nm
- Max. Output < 1mW
CLASS 2 LASER PRODUCT
Stages of unpacking

Unpacking should only be done by at least four people or using a lifting device which can take up to at least 200 kg.

Before opening the cardboard box, check that it is the right way up.

After opening the box:

1. Take out the manual.
2. Take out the box of accessories and take off the protective packaging.
3. Put the lifting straps into the lifting device (pict.). Then, following the device security rules advised lift the IS900 IQ+ machine and place it onto the work station
4. Take off the lifting straps from the lifting device.

Make sure that no components are missing from the packaging. If any part has been forgotten please get in touch with your GRAVOGRAPH dealer.

Keep all the packaging materials so that you can move your machine in total safety. This packing was conceived to guarantee the protection of the machine during its transport (for a return in repair for example).

This packaging is in conformity with European recycling standards.
Unpacking - Contents of package

Check the condition of the packaging when you receive it. If there are any signs of damage, inform the carrier and your GRAVOGRAPH dealer immediately by recorded delivery, specifying the exact nature of the problem.

Content of package

A. An IS900 IQ+ engraving machine
B. User instructions (on CD)
C. A tool box
D. A power cable
E. An IS900 IQ+ engraving table - IS electronics box connection cable
F. An auxilliary connection cable
G. An USB connection cable
   (for the machines which are controlled by PC)
F1. Two clamps with a tightening key (F2)
**Contents of the tool box for a machine with a standard motor spindle - 90W**

D1. A depth-regulating nose  
D2. A round and green spindle belt  
D3. A cutter knob  
D4. 2 fuses 10 A (T*)  
D5. A short allen key (2 mm)  
D6. A round allen key (3 mm)  
D7. A brush  
D8. 6 keys ...  
D10. A screwdriver (3,5)

(T*) = These fuses are temporized, with a high breaking capacity and comply with the IEC 127-2 norm.

**Contents of the tool box for a machine with an optional motor spindle - 200W**

D1. A depth-regulating nose  
D2. A spindle notch belt  
D3. A cutter knob  
D4. 2 fuses 10 A (T*) (machine)  
D5. A short allen key (2 mm)  
D6. A round allen key (3 mm)  
D7. A brush  
D8. 6 keys ...  
D9. 2 fuses 4 A (T*) (200W motor supply)  
D10. A screwdriver (3,5)  
D11. A pair or tightening rods  

(T*) = These fuses are temporized, with a high breaking capacity and comply with the IEC 127-2 norm.
**Description**

The **IS900 IQ+** machine is an engraving machine. It has a keyboard, and a control panel with a L.C.D. screen connecting the software which is in the machine. Files to be engraved are transferred from the computer to the machine by the intermediary of a cable which is plugged into one of the two ports on the port USB on the **IS900 IQ+**. The actual engraving process is controlled by the spindle.

The object to be engraved is held by a clamping table (as standard), by a vice (optional) or by any other system recommended by GRAVOTECH MARKING SAS (consult your GRAVOGRAPH dealer for more information on systems available).

This machine profits from a new technology, the IQ+ concept (Intelligence Quotient +), which offers, inter alia, a considerable improvement speeds of displacement as well as a faster communication machine/PC.

The **IS900 IQ+** machine has a maximum engraving surface area of 635 x 432 mm. The **IS900 IQ+** engraving machine is a high performance machine: All dispositions contributing to the safety of use must imperatively be respected.

**Front view of the machine**

**Engraving table**

A. Base
B. Control panel :
   B1. L.C.D. screen
   B2. 12-key control keyboard
   B3. Spindle rotation speed adjustment
J. Tool holder
T. Clamping table :
   T1. Tightening handle of the clamps
E. Protective housing
J4. Adjustment knob of the spindle pressure (6 positions)
L. Main stop button

**IS900 IQ+**
Tool holder - standard motor - 90W

J1. Cutter
J2. Cutter button
J3. Red LED indicating the rotation of the spindle
J4. Adjustment knob of the spindle pressure (6 positions)
J5. Scaled knob
J6. Index finger
J7. Nose nut
D1. Depth regulating nose
D2. Spindle belt (round and green)
J8. Spindle motor 90W
J9. LASER diode
J10. Connection variator - 150W High Frequency spindle motor (option)
J12. Pneumatic connector - 150W H.S. spindle air fan (option)
J13. Auxiliary connection (option)

As long as the protective housing (E) of the machine is opened, the machine remains in pause. Do not never bypass this safety.
When the spindle motor is in rotation, the red LED (J3) is lit.
**Tool holder - optional motor - 200W**

1. Cutter
2. Cutter button (special collet spindle)
3. Red LED indicating the rotation of the spindle
4. Adjustment knob of the spindle pressure (6 positions)
5. Scaled knob
6. Index finger
7. Nose nut
8. Depth regulating nose
9. Spindle belt (notch belt)
10. Spindle motor 200W
11. LASER diode
12. Connection variator - 150W High Frequency spindle motor (option)
13. Pneumatic connector - 150W H.S. spindle air fan (option)
14. Auxiliary connection (option)

---

**WARNING**

Do not stare into beam.

LASER diode - Wavelength: 630-680nm - Max. Output < 1mW

CLASS 2 LASER PRODUCT.

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This sign shown on the tool-holder of the machine shows the danger caused by the rotating spindle during engraving (risks of getting burnt or cut).

To avoid any risks of getting burnt, the protective belt housing (E) of the machine must be always closed, except when carrying out adjustments (if not the machine remains in pause).

As long as the protective housing (E) of the machine is opened, the machine remains in pause. Do not never bypass this safety.

When the spindle motor is in rotation, the red LED (J3) is lit.
Control panel

- START (engraving start)
- PAUSE
- VALIDATION
- CANCELLATION and CONFIGURATION
- SPINDLE ROTATION (Spindle motor On/Off)
- PLATE
- Z REF
- SPINDLE ORIG. ADJUST and RDF MENU
- JOYSTICK
- SPINDLE ROTATION SPEED

On the engraving machine

- MAIN STOP BUTTON
**Clamping table**
The IS900 IQ+ machine is supplied with a mounted clamping table (T) with a tightening handle (T1). The clamping table (T) allows to hold a flat and large object to be engraved.

**Vice (option)**
The vice allows to hold odd shaped and small objects to be engraved (small volume).

**To mount the vice onto the clamping table:**
1. Place and fix the vice onto the clamping table. Do not place it onto the two first grooves (1 and 2) on the left.

**To mount a pair of jigs onto the vice:**
1. Open the jaws (M2) by turning the tightening knob (M3) anti-clockwise.
   Open them far enough so as to mount the jaws easily.
2. Push the jigs (T) firmly onto the pins (M4) of the jaws (M2).
Rear view of the machine

Each connection responds to one of the following security levels:
- Dangerous voltage.
- Very low security level.

Engraving machine connections:

N1 - Links the engraving table with the IS electronics box - Very low security level
N2 - Auxiliary connection (option) - Very low security level
N3 - External spindle connection (option) (200W spindle or 150W H.F. spindle) - Very low security level
N4 - Pneumatic supply for the air fan (air seal) of the H. F. spindle (option)
N5 - Passage for the adjustable oil-projection tube of the GRAVOGRAPH lubrication system (option)
N6 - Plug for accessories (5 A max.) - Dangerous voltage

The (N6) plug can only be used with appliances working on 5 A max. and fitted with an integrated protection against overload.

N7 - Mains supply plug with a drawer of 2 fuses 10 A (T*) 250 V - Dangerous voltage

(T*) = These fuses are temporized, with a high breaking capacity and comply with the IEC 127-2 norm.

The machine must always be switched off before connecting or disconnecting a cable as indicated on label E1 displayed on the back of the machine:

IS electronics box connections:

P1 - Links the engraving table with the IS electronics box - Very low security level
P2 - Auxiliary connection (option) - Very low security level
P3 - External spindle connection (option) (200W spindle or H.F. 150W spindle) - Very low security level
P4 - Standard Inputs /Outputs - Very low security level
P5 - Parallel port - Very low security level
P6 - Connection to the control panel - Very low security level
P7 - USB port - Very low security level
P8 - IS electronics box power supply - Dangerous voltage
200W motorization connections (option):

M1 - 200W option motor power supply with a drawer of 2 fuses 4 A (T*) 250 V - Dangerous voltage

(T*) = These fuses are temporized, with a high breaking capacity and comply with the IEC 127-2 norm.

M2 - 200W spindle motor connection (option) - Dangerous voltage
M3 - 200W spindle motor connection (option) - Very low security level

The machine must always be switched off before connecting or disconnecting a cable as indicated on label E1 displayed on the back of the machine:

E1 NE PAS CONNECTER / DECONNECTER SOUS TENSION
DO NOT CONNECT / DISCONNECT WHEN THE MACHINE IS ON
Installing

Physical installation and electrical installation (connections) must only be carried out by an approved GRAVOGRAPH technician. Before carrying out the following operations, make sure the machine is switched off and unplugged, switch (L) to position 0.

Physical installation advice

- Put the Gravograph machine onto a stable flat, clean surface with mini. sizes of 1015 x 750 mm. Make sure the machine is well-ventilated. Do not prevent the air circulation under the machine.

We recommend to you the use of the support (S) especially conceived for the machine IS900 IQ+.

- Normal lighting is sufficient to use the machine.

- Clear the work surface so that you can
  - easily and quickly access all external parts of the machine,
  - quickly gain access, in case of necessity, the general shutdown button (L) of the machine,
  - make sure that all moving parts of the machine have enough room to move freely,
  - avoid any accidental unplugging of the cables.

The machine’s power supply cable being used as a sectionning device, it must be easily accessible and the wall plug must be installed near the machine and must also be easily accessible.

The connectors screws must be very tight to avoid accidental disconnection of the cables while the machine is turned on as this could permanently damage the electronic cards (label E1).

- Protect Gravograph equipement against :
  - Moisture (rain, snow, condensation...),
  - Heat (direct sunlight, heating...),
  - Brusque temperature changes,
  - Dust (exhaust pipe),
  - Liquid splashes, spillages on the electronic rack, cables and connections, and any other part of the machine; unless recommended by GRAVOTECH MARKING SAS (ex. : lubrication),
  - Vibrations,
  - Electric or electronic radiation.

Pouvez-vous lire le texte naturellement?
Electric installation advice

This material is «class 1». The mains plug MUST always be connected to a neutral socket and comply with the regulations in force in the country of installation. If you do not have a plug of this type, have one installed by an approved electrician. Under no circumstances should you depart from this instruction.

In order to avoid outside interference, the user is advised to carry out the following points.

• Plug the Gravograph machine into a mains line, avoiding having several machines on the same line (several plugs on the same line or using a multi-plug).

Exception: If other things are connected to the machine (such as a computer and the IS900 IQ+ engraving machine), the machines should be connected to the same mains line.

• Avoid using the same line to supply inductive or capacitive machines as well as the Gravograph machine (motors, electrosliuces, chargers...)

• Avoid using a manual or automatic commutator on the same mains line as the Gravograph machine (relay, temporiser, programmer, automatic circuit interrupter, automatic interrupter...).

• Check that machines surrounding your Gravograph machine are in conformity to the norms of radioelectric perturbation emissions (consult the technical leaflet of each machine). If they are not in conformity, place them as far away as possible from the Gravograph machine.

• Only use Gravograph accessories.

The machine must always be switched off before connecting or disconnecting a cable (label (E1)).

NE PAS CONNECTER / DECONNECTER SOUS TENSION
DO NOT CONNECT / DISCONNECT WHEN THE MACHINE IS ON
Electrical connections of the machine

Machine with a standard spindle - 90W motor

Position yourself behind the machine.

1. Plug in the engraving table-IS electronics box connection cable (F), first to the IS electronics box (P1) box, then to the engraving table (N1). Tighten the screws (V) using the screwdriver (3.5).

2. Plug in the control panel cable to the IS electronics box (P6). Tighten the screws (V) using the screwdriver (3.5).

   It is imperative to set the screws (V) tight to avoid any accidental disconnection of the cables while the machine is turned on, as this could permanently damage the electronic cards (label (E1)).

3. Check that the connector (P2) is well connected with the connector (N2) with the cable (G).

4. Check that the power supply cord (E) of the IS900 IQ+ machine is well connected on the power supply (P8) of the IS electronics box of the machine.

5. Plug power supply cord (E) into the engraving machine (N7) and then into the mains socket.

   To cut off the mains supply to your machine in the case of severe problems, unplug the mains cable (E) or switch off the machine with the main stop button (L) at the side of the machine. Make sure that you can reach them easily.
Carry out in first the connections as for a machine been driven by an engine of standard spindle 90W, while following the first 4 stages of the procedure described on the preceding page (Do not immediately connect the power supply cord (E) into the mains socket).

Then carry out the following procedure:

5. Connect the connectors (P3) (external spindle) and (M2) (200W motor option) with the cable (I1).

6. Connect the connectors (N3) (external spindle) and (M3) (200W motor option) with the cable (I2).

It is imperative to set the screws (V) tight to avoid any accidental disconnection of the cables while the machine is turned on, as this could permanently damage the electronic cards (label (E1)).

7. Plug power supply cord (E2) into the 200W option motor power supply (M1) and then into the plug (N6) for accessories supply.

8. Plug power supply cord (E) into the engraving machine (N7) and then into the mains socket.

To cut off the mains supply to your machine in the case of severe problems, unplug the mains cable (E) or switch off the machine with the main stop button (L) at the side of the machine. Make sure that you can reach them easily.
Machine with the High Frequency spindle 150W - Option

Position yourself behind the machine.

Carry out in first the connections as for a machine been driven by an engine of standard spindle 90W, while following the first 4 stages of the procedure described on the page 20. (Do not immediately connect the power supply cord (E) into the mains socket).

Then carry out the following procedure:

5. Connect the connectors (P3) (external spindle) and (A8) (150W H.F. spindle option) with the cable (I3).

6. Connect the connectors (N3) (external spindle) and (A2) (150W H.F. spindle option) with the cable (I4).

It is imperative to set the screws (V) tight to avoid any accidental disconnection of the cables while the machine is turned on, as this could permanently damage the electronic cards (label (E1)).

7. Connect the pneumatic connectors (A1) of the frequency converter (A) (H.S. spindle air fan) and (N4) of the machine with the pneumatic tube (I5).
8. Connect the pneumatic connectors (J12) above the tool holder (H.S. spindle air fan) and (C2) of the 150W HF spindle (150W HF spindle option) with the pneumatic tube (H7).

9. Connect the connectors (C1) (HF spindle) and (J10) (150W HF spindle option) with the cable (H6).

10. Plug power supply cord [E3] into the power supply connector (A4) of the converter (A) and then into the plug (N6) for accessories supply.

11. Plug power supply cord [E] into the engraving machine (N7) and then into the mains socket.

To cut off the mains supply to your machine in the case of severe problems, unplug the mains cable [E] or switch off the machine with the main stop button [L] at the side of the machine. Make sure that you can reach them easily.
Connecting the IS900 IQ+ machine to a PC

The computer and the IS900 IQ+ machine must be switched OFF.

**PC computers and the WINDOWS® graphic environment being very widespread throughout the world, we have based ourselves on these products to define the installation and use procedures of the IS900 IQ+.**

If you don't have equipment which is compatible and you encounter some problems of installation or use, contact your Gravograph agent.

**Connection cables**

- Use Gravograph connection cables (consult your Gravograph distributor for the products available).
  - These cables are adapted for the machines to which they will be connected.
  - They must be in conformity with the electromagnetic compatibility standards, norm EN 55022 - class B and protect from external electric "attacks" (conform to the norms of immunity and CEM susceptibility).
- Do not use cables which are too long. Keep the machines as close as possible and use a short a cable as possible.
- Separate the mains cable and the transmission cable (avoid connecting the transmission and mains cables to the same socket, etc...).

**Follow the connection procedure depending on the transmission cable supplied with the IS900 IQ+**.

The machine is delivered with the following cable:

- USB cable (P)
1. Plug the USB cable (P) into the USB port N2 of the machine (pict.).

2. Plug the USB cable (P) into the USB port of the PC. Refer to the installation manual of the computer for the USB port (1.1).
Switching the machine on

Turn and pull the machine main stop button (L).
Après quelques secondes, The machine will then emit a short «beep». The following message will be displayed on the L.C.D. screen of the machine:

<< GRAVOGRAPH >>
VERSION XX.XX

Leave the machine plugged in even if it is not in constant use.

Problems
If one of the operational signs is absent, check the following points:
• Are the two ends of the mains cable correctly connected?
• Is the mains plug connected? Is it live?

If the machine does not come on, before calling a technician, please check power connections to the mains socket and also the fuses (see "Changing the fuses").

Switching the machine off

Press on the main stop button (L).
Switch off the machine for the following reasons:
- if you are leaving the workstation (end of the day, for example),
- physical damage (fall, fire, liquids coming into machine...),
- mechanical/electrical/electronic faults, leading to a possible breakdown,
- in case of major problem or mechanical block of the machine,
- to reboot,
- for external cleaning.

Mechanical block
In the following cases:
- danger for the operator,
- block on the support to be engraved,
- block on an object placed in the work area,

1. **Cut the power supply by pressing on the main stop button (L).**
2. **Free the tool, without switching the machine on, by manually and slowly moving the tool holder as required.**
3. **Only switch the machine back on after ensuring that the tool’s moving area is totally clear.**

Switching on again
If the machine or the programme which runs it crashes you may have to reboot the machine.
If this happens, switch the machine off. Wait 30 seconds and switch it on again.

Respect this rule. This time allows any electric shock to the machine, possibly damaging the power supply, to be avoided.
Machine configuration (language)

1. **Switch on the IS900 IQ+ machine (turn and pull the machine main stop button (L)).**
   A first message will be displayed on the screen:
   
   ![<< GRAVOGRAPH >>
   VERSION XX.XX](image)

   This message will be displayed for about 3 seconds. During that time press
   
   ![LANGUAGE : ENGLISH to modify](image)

   **If this screen does not appear after having pressed**, switch the IS900 IQ+ machine off, wait a few seconds, switch it on again, then start the configuration procedure from the beginning.

2. **Select the language desired.**
   When you receive your IS900 IQ+ machine it is configured to display the messages in English.
   
   To choose the language desired press ![as many times as necessary](image).
   The selected language is displayed on the screen.

   To validate your choice press
   
   ![The following message is displayed on the L.C.D. screen:](image)

3. **Select the IS900 IQ+ machine**
   The programme used by the IS900 IQ+ machine is also used by other GRAVOGRAPH machines.

   To choose the machine desired press ![as many times as necessary](image).
   The selected machine is displayed on the screen.

   To validate your choice press
   
   ![The following message is displayed on the L.C.D. screen:](image)

   Wait a few seconds.
   The following message is displayed on the screen:

   ![<< GRAVOGRAPH >>
   VERSION XX.XX](image)

   Press
   
   ![Release the key when the tool-holder of the IS900 IQ+ machine starts to move.](image)

   The machine configuration that you have carried out is saved. In this way the display language that you have just chosen will be taken into account each time you switch the machine on.

4. **Switch the machine off (press on the machine main stop button (L)).**
Make the IS900 IQ+ machine ready to engrave with GravoStyle 5

1. Check that your computer has the minimum required configuration:

<table>
<thead>
<tr>
<th>Computer</th>
<th>Minimum configuration</th>
<th>Recommended configuration</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Microprocessor</strong></td>
<td>Intel® Pentium™ IV</td>
<td>Intel® Core™ 2 Duo</td>
</tr>
<tr>
<td><strong>Frequency</strong></td>
<td>3.0 GHz</td>
<td>2.4 GHz</td>
</tr>
<tr>
<td><strong>Memory</strong></td>
<td>1 GB</td>
<td>2 GB</td>
</tr>
<tr>
<td><strong>Internal hard-drive</strong></td>
<td>1 GB available</td>
<td>2 GB available</td>
</tr>
<tr>
<td><strong>Internal DVD reader</strong></td>
<td>4X DVD-ROM</td>
<td>16X DVD-ROM</td>
</tr>
<tr>
<td><strong>Mouse</strong></td>
<td>2 buttons Windows compatible</td>
<td>2 buttons + scroll wheel Windows compatible</td>
</tr>
<tr>
<td><strong>Keyboard</strong></td>
<td>Windows compatible</td>
<td>Windows compatible</td>
</tr>
<tr>
<td><strong>Ports</strong></td>
<td>2 USB ports available:</td>
<td>4 USB ports available:</td>
</tr>
<tr>
<td></td>
<td>Dongle</td>
<td>Dongle</td>
</tr>
<tr>
<td></td>
<td>Machine</td>
<td>Machine 1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Machine 2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Machine 3</td>
</tr>
<tr>
<td><strong>Graphic card</strong></td>
<td>NVIDIA or ATI Radeon 128 MB</td>
<td>NVIDIA or ATI Radeon 256 MB</td>
</tr>
<tr>
<td><strong>Monitor</strong></td>
<td>17” - 1024 * 768 pixels</td>
<td>22” - 1280 * 1024 pixels</td>
</tr>
<tr>
<td><strong>Peripherals</strong></td>
<td>Printer</td>
<td>Twain scanner</td>
</tr>
<tr>
<td><strong>Additional software</strong></td>
<td>Internet Explorer 6</td>
<td>Internet Explorer 7</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Operating Systems</th>
<th>32 bits version</th>
<th>64 bits version</th>
</tr>
</thead>
<tbody>
<tr>
<td>Windows Vista SP1</td>
<td>COMPATIBLE</td>
<td>COMPATIBLE</td>
</tr>
<tr>
<td>Windows XP SP3</td>
<td>COMPATIBLE</td>
<td>COMPATIBLE</td>
</tr>
<tr>
<td>Windows 2000</td>
<td>NOT COMPATIBLE</td>
<td>Does not exist</td>
</tr>
<tr>
<td>Windows 98</td>
<td>NOT COMPATIBLE</td>
<td>Does not exist</td>
</tr>
</tbody>
</table>

2. See the chapter "Make a Gravograph rotary machine ready to engrave" in the appendix "Gravograph Machines Soft setup" in order to install the GT Smartstream 3.xx driver and the Gravostyle 5 engraving software on your PC.

Then add the IS900 IQ machine in the "Installed printer list" of the GravoStyle 5 engraving software.
Engraving
You have just created a composition with your engraving software.

1. **Switch on the machine and wait a few seconds.**
The following message will appear on the screen of the machine:

   < READY TO RECEIVE >

2. **In the engraving programme, make sure that you have indicated the good engraving parameters, the good machine parameters, the Z speed and the engraving orientation:**

   ![Engraving Interface](image)

   For a flat engraving, you should select the function (1) in order to activate the automatic ZRef. function (3).

   You could indicate a personalized origin (2) to use the "point and shoot" function.
Positioning the plate on the clamping table

Clamping a new plate with a different thickness:

3. Lower the handle (T1) (clamping position) on the table.

4. Place the plate against the clamps (plate in the top left-hand corner). If necessary, untighten the screws (V5), with the round allen key (D6) supplied with the machine to slide the plate easily under the clamps (T2)

5. Tighten the screws (V5) till the plate is held tightly in place.

Do not tighten the screws (V5), excessively: this may damage the clamp spring after frequent uses.

6. Also use the clamps (F1) delivered with the machine.
If the plate is correctly tightened, noise and vibrations are reduced to a minimum when the machine is engraving.

Check that the object is tightened correctly to ensure that it is not ejected during engraving.
Clamping a new plate with the same thickness:

3. Lift up the handle (T1) on the table to remove the previous plate.

4. Place the plate against the clamps (T2) (plate in the top left-hand corner).

5. Lower the handle (T1) ((clamping position) on the table.

6. Also use the clamps (F1) delivered with the machine.

If the plate is correctly tightened, noise and vibrations are reduced to a minimum when the machine is engraving.

Check that the object is tightened correctly to ensure that it is not ejected during engraving.
Positioning the plate onto the vice (option)

3. Choose the jigs (M) according to the length of the plate (consult your GRAVOGRAPH dealer for more information on the various jigs available).

The length of the plate should not exceed the length of the jigs:

See "Clamping the object to be engraved" in the "Physical configuration of the machine" paragraph of chapter "Engraving techniques" in the user manual "CN 97 Program".

4. Choose adequate side of the jigs (M) according to the thickness of the plate.

The plate should be slightly higher than the jigs to avoid that the regulating nose touches the jigs:

5. Mark the middle of the plate ((not necessary if you use the "Point of shoot (PnS)" function).

6a. Centre the plate so that the centre mark is lined up with the 0 on the jig (origin centre):

6b. Using the tightening knob, tighten the plate so that it cannot move during engraving.

If the plate is correctly tightened, noise and vibrations are reduced to a minimum when the machine is engraving.

Check that the object is tightened correctly to ensure that it is not ejected during engraving.
**Point and Shoot**

This GravoStyle function permits to define the engraving area on the plate with the machine.

7a. Click on "Point and Shoot" in Gravostyle

This message is displayed on the LCD-screen of the control panel of the IS900 IQ+ machine:

< JOYSTICK >
\[X = \text{xxx.xx} \quad I \quad Y = \text{xxx.xx}\]

7b. Move the spindle to the first corner (1) of the area to engrave by using the joystick

7c. Validate

< JOYSTICK >
\[X = \text{xxx.xx} \quad I \quad Y = \text{xxx.xx}\]

7d. Move the spindle to the opposite corner (2) of the area to engrave by using the joystick

7e. Validate

This message is displayed on the LCD-screen:

<READY TO RECEIVE>
8. From your engraving software, transfer the composition to the IS900 IQ+ machine.

The engraving machine displays the number of bytes received:

```
To engrave
XXXX bytes received
```

The following message is displayed for a few seconds as soon as the transfer is complete:

```
TRANSFER COMPLETED
```

Then the following message is displayed:

```
< READY TO RECEIVE >
to engrave
```

The machine is ready to engrave.

---

**Activation of the RDF function**

```
< READY TO RECEIVE >
to engrave
```

8b. Press

```
APF MENU
to select
```

8c. To reach the RDF menu, press as many times as necessary

```
RDF MENU
to select
```

8d. To validate your choice press

```
RDF SYSTEM NO
to select
```

8e. To activate the RDF function, select "YES" using the 2 keys

```
RDF SYSTEM YES
to select
```

8f. Press

```
< READY TO RECEIVE >
to engrave
```

The RDF function (Profile Following) is activated. During the engraving of plates which are not plane, this function calculates and adjusts automatically the position of the tool holder.

For the engraving with a cutter, you must use a depth regulating swivel nose. The adjustment knob (J4) of the spindle pressure should not be on the position (6). The maximum defect of flatness of the plate corresponds to a slope of 15° max..
Adjusting the spindle

9. Press the key and the key straight after.

The tool holder stops above the material to be engraved exactly where the engraving should start.

Adjusting the spindle pressure

10. Set the spindle pressure with the knob (J4) on the position (2). Adjust if necessary. (Position (6) = Rigid spindle and position (1) = Supple spindle).

Press the knob (J4) in order to turn it. As soon as the desired position is reached pull it slightly.

In RDF mode, the knob (J4) should not be on the position (6).

11. Set the regulating nose (4) in place on the spindle and tighten the nose nut.

12. Unscrew the index finger (5) then unscrew the scaled knob (5.1) (diagram 29).

Line up the 0 of the scaled knob with the index finger (6). The scaled knob should be unscrewed in such a way that the index finger blocks it.
Putting the cutter into the spindle
This plate will be engraved using a conical tool (J1) (or conical cutter) made of high speed steel with a 4.36 mm diameter and a 0.50 tip.

13. Lower the spindle until the depth regulating nose touches the material to be engraved.

Press

To lower press

14. Open the belt housing of the tool-holder (E).

As long as the protective housing (E) of the machine is opened, the machine remains in pause. Do not never bypass this safety.

15. Screw knob of cutter (J2) onto the spindle (diagram 32).
The spindle knob should be tightened anti-clockwise (knob with left-hand thread).

The tool is very sharp and to avoid any risks of getting cut, you are advised to use some kind of protection (gloves) to handle it.
16. Insert the cutter into the button until it is touching slightly (carbide cutters are not very shock resistant) the engraving material. To facilitate the insertion of the cutter, slightly unscrew the screw (3) located on the spindle knob (diagram 34).

Remember to program 0.5 to 1 mm depth to compensate possible flatness faults of the plate.

200W optional spindle
Screw (anti-clockwise) the tightening knob (8) as much as possible so that the cutter is held correctly in the collet (diagram 58). Use the 2 tightening rods (D11).

90W standard spindle

17. Tighten the screw (3) of the cutter button to lock it into place.

For greater convenience, we advise that you have as many cutter knobs as you have cutters, so you can leave them together and keep the settings for possible jobs to be carried out in the same conditions in the future (same thickness of materials). For this, you will need to request "the machine configuration save with ZREF" (see "Saving the machine configuration" paragraph of chapter "Basic techniques" in the user manual "CN97 Program").

18. Close the protective housing (E) of the machine.

To avoid any risks of getting burnt, the protective housing (E) of the tool-holder must be always closed, except when carrying out adjustments (if not the machine remains in pause).

Setting-up the spindle origin

19. Save the position of the spindle by pressing

The spindle moves up.

Adjusting the tool depth

20. Turn the index finger a few notches to the right to obtain the desired engraving depth (one notch = 0.025 mm) (diagram 35).

Refer to the table opposite for the number of marks to move the index finger depending on the desired depth and the material used.

<table>
<thead>
<tr>
<th>Engraving material</th>
<th>Type of cutter</th>
<th>Engraving depth (mm)</th>
<th>Number of marks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gravoxal</td>
<td>Carbide</td>
<td>0,1</td>
<td>4</td>
</tr>
<tr>
<td>Silver</td>
<td>Carbide</td>
<td>0,2</td>
<td>8</td>
</tr>
<tr>
<td>Chrome</td>
<td>Diamond</td>
<td>0,025</td>
<td>1</td>
</tr>
<tr>
<td>Gravometal</td>
<td>Carbide</td>
<td>0,1</td>
<td>4</td>
</tr>
<tr>
<td>Gravoply II</td>
<td>Carbide</td>
<td>0,1</td>
<td>4</td>
</tr>
<tr>
<td>Stainless Steel</td>
<td>Diamond</td>
<td>0,1</td>
<td>4</td>
</tr>
<tr>
<td>Brass</td>
<td>Carbide</td>
<td>0,3</td>
<td>12</td>
</tr>
<tr>
<td>Metallex</td>
<td>Carbide</td>
<td>0,1</td>
<td>4</td>
</tr>
<tr>
<td>Gold</td>
<td>Carbide</td>
<td>0,2</td>
<td>8</td>
</tr>
<tr>
<td>Plastic</td>
<td>Carbide</td>
<td>0,35</td>
<td>14</td>
</tr>
</tbody>
</table>

21. Tighten the index finger in order to maintain the scaled knob in this position.
Adjusting the rotation speed of the spindle

22. Turn the button (M) on the control panel to the speed required:
   - From 10000 to 20000 rpm. for the standard spindle (white graduations).
   - From 5000 to 60000 rpm. for the option HF spindle (orange graduations).

If you wish the spindle to remain without rotation press...
Launching the engraving

This sign shown on the spindle of the machine shows the danger caused by the rotating spindle during engraving (risks of getting burnt or cut).
To avoid any risks of getting burnt, the protective housing (E) of the tool-holder must be always closed except for when adjusting the tool-holder and changing the spindle belt (if not the machine remains in pause).
For your own personal safety and to avoid any risks of being crushed by the machine during engraving, do not stand near the tools or lean over the spindle holder (the travel area of the tool is 660 x 460mm).
Always wear protective glasses against chip ejection.

Before starting the engraving, ensure:
- that the object is tightened correctly.
- that the spindle travel area is completely clear.
- that no one is in the travelling area of the moving parts of the machine.
- that no object will obstruct the travelling of the moving parts.

Start the engraving from the IS900 IQ+ machine control panel.

23. Press the START Key (Engraving Start)
The tool holder will move, at protected speed (slow), to the first point in the engraving exactly where the engraving should start.

To obtain a faster displacement, maintain the START key pressed until at the first point of engraving. Warning - Ensure that no one is in the travelling area of the moving parts of the machine and that no object will obstruct the travelling of the moving parts.

In the event of a problem, press the PAUSE key

The machine will momentarily pause.

To continue with the rest of the engraving, press the START key
To stop engraving completely, press one of the arrows on the joystick (arrow keys).

To increase the travel speed of the spindle during engraving, press the arrow key
To reduce the travel speed of the spindle during engraving, press the arrow key
**General maintenance**

**Before carrying out any maintenance, unplug the mains supply cable (label E2).**

No internal part of the Gravograph machine requires user intervention: general maintenance is limited to external cleaning. If necessary, the user can change the belt or fuses.

If you wish to have the inside of your machine cleaned, contact a Gravograph technician.

The mains cable should always be replaced if it is damaged in any way: flattened, nicked, cracked etc..., or if there are bare wires.

**Changing the belt**

You will find a spare belt (D2) in the machine tool box: a round and green belt for 90W spindle motor or a notch belt for 200W spindle motor.

1. Open the protective housing (E) of the tool-holder.
2. Unscrew the screw (2) of the adjustment knob (J4) of the spindle pressure and take the knob.
3. Unscrew the 4 screws (5) and take the housing (6) off.
4. Loosen the screw (7) and move away the casing (8) from the belt.
5. Pull the belt off with one hand (D2) upwards, and turn the motor pulley with the other.
6. Put the belt (D2) in the spindle pulley groove.
7. Put the belt (D2) into the pulley groove opening with one hand and turn the pulley with the other.
8. Replace the casing (8) and tighten the screw (7).
9. Replace the housing (6) and tighten the 4 screws (5).
10. Replace the adjustment knob (J4) and tighten the screw (2).
11. Close the protective housing (E) of the tool-holder.

To avoid any risks of getting burnt, the protective housing (E) of the tool-holder must be always closed, except when carrying out adjustments (if not the machine remains in pause).
Changing the fuses

**Engraving table**

You will find spare fuses in the machine tool box.

The machine IS900 IQ+ is supplied with 1 pair of fuses 10 A (T*) 250 V.

(T*) = These fuses must be temporized, with a high breaking capacity and must comply with the IEC 127-2 norm.

Unplug your machine cable from the mains.

1. Disconnect the mains cable from the socket at the back of the engraving table to give easier access.

2. Press the tag (A) to pull out the drawer containing the fuses.

3. Replace the fuse(s) and close the drawer again.

   **If the new fuse blows without apparent reason, contact an approved GRAVOGRAPH technician.**
Presence of the 200W spindle option - electronics IS box

You will find spare fuses in the machine tool box.
The machine IS900 IQ+ (with the 200W spindle option) is supplied with 1 pair of fuses 4 A (T*) 250 V.

(T*) = These fuses must be temporized, with a high breaking capacity and must comply with the IEC 127-2 norm.

Unplug your machine cable from the mains.

1. Disconnect the mains cable from the socket at the back of the engraving table to give easier access.
2. Pull out the drawer containing the fuses.
3. Replace the fuse(s) and close the drawer again.

If the new fuse blows without apparent reason, contact an approved GRAVOGRAPH technician.
Adjusting the machine

After it has been used for some while the reference points ("0" points) of the IS900 IQ machine can alter slightly (the centre of the engraving area of the machine is slightly out of line with the clamping system, the Z position at the mechanical stop is above or below its normal position).

The IS900 IQ machine has a very simple adjustment system which can be carried out by the user (which enables the machine to be adjusted without having to return it to the distributor).

If you notice that it is out of line in relation to your engraving measurements, adjust the machine.

The IS900 IQ machine have 2 reference points :
- The reference point "left corner", Oc(Xc,Yc) is the reference for engraving with the clamping table.
- The reference point "red pointer", Op(Xp,Yp) is the reference for the red pointer.

To adjust the IS900 IQ machine with a clamping table in X,Y

1. Switch on the IS machine.

2. When this message is displayed press

3. Place the plate (A) in the top left-hand corner(C).

   The plate should be level with the top of the T-slot table and against the clamp (V5) using as end stop.

4. Take off the cutter, the cutter knob and the depth-regulating nose that may be fitted on the spindle.

5. Validate

   The spindle returns to the reference point "left corner", coordinates Oc(Xc,Yc).

   The following Oc(Xc,Yc) menu comes up:

6. Press

7. Drop the tool-holder 1 centimetre from the top left-hand corner of the plate

8. Press
9. From the top of the spindle with the cutter knob off, look through the cutter passage. The left hand corner of the plate should be placed in the centre of the hole.

   You can also check with the end of a tool mounted on the spindle. In this case the end of the tool must be located precisely at the left corner of the plate.

10. If it does not, adjust the position of the tool-holder using the joystick.

11. Repeat steps 9 and 10 until the correct setting is achieved.

12. Once it is correctly adjusted, save the position of the reference point "left corner" Oc(Xc,Yc) in X,Y pressing the \( \checkmark \) key until it shortly beeps.

   The adjustment of the reference point "left corner" Oc(Xc,Yc) in X,Y is finished.

   The spindle moves towards the reference point "red pointer", coordinates Op(Xp,Yp) :

   \[
   \begin{align*}
   \text{JOYSTICK} & \quad \text{XY} \\
   X=x.xx & \quad Y=y.yy
   \end{align*}
   \]

13. The red pointer must indicate exactly the left corner of the plate.

14. If it does not, adjust the position of the tool-holder using the joystick.

15. Repeat steps 14 and 15 until the correct setting is achieved.

16. Once it is correctly adjusted, save the position of the reference point "red pointer" Op(Xp,Yp) in X,Y by pressing the \( \checkmark \) until it shortly beeps.

   The adjustment of the reference point "red pointer" Op(Xp,Yp) in X,Y is finished.

   The adjustment of the reference points "left corner" Oc(Xc,Yc) and "red pointer" Op(Xp,Yp), in X,Y, is finished.
To adjust the IS900 IQ machine with a clamping table in Z

17. Place the depth regulating nose on the spindle.

18. Press
The tool-holder moves towards the centre of the clamping table.
The spindle lowers until the depth regulating nose touches the plate

19. The regulating nose must be tangent with the plate (contact without pressure)

20. If it does not, adjust the Z position of the spindle, using the 2 keys and

21. Repeat steps 19 and 20 until the correct setting is achieved.

22. Once it is correctly adjusted, save the Z position of the spindle, pressing the key until it shortly beeps.
The adjustment of the Z position of the spindle, is finished.
The spindle moves towards the reference point "left corner", coordinates Op(Xp,Yp).

To program a protected displacement
By default, as soon as you press the START key (Engraving Start), the tool holder will move, at protected speed (slow), to the first point in the engraving exactly where the engraving should start. It is possible to program a not protected displacement by default :

23. Press

24. Select one of the 2 choices (Yes or No) using the 2 keys

For your safety we recommend to you to choose the protected displacement. Because it is possible for you to obtain a faster displacement by maintaining key START pressed until at the first point of engraving.

If you want to choose "NO" press the key until it shortly beeps.

Warning - Ensure that no one is in the travelling area of the moving parts of the machine and that no object will obstruct the travelling of the moving parts.

If you want to choose "YES" press the key.
The start menu (A) appears :

<< GRAVOGRAPH >>
VERSION XX.XX
## Technical Characteristics

### Physical characteristics

<table>
<thead>
<tr>
<th></th>
<th>IS900 IQ+ Machine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall size (w x d x h)</td>
<td>1012 x 825 x 603 mm</td>
</tr>
<tr>
<td></td>
<td>39.8 x 32.5 x 23.7 in</td>
</tr>
<tr>
<td>Net weight (without accessories)</td>
<td>90 kg - 40.8 lb</td>
</tr>
<tr>
<td>Package size (w x d x h)</td>
<td>1210 x 982 x 855 mm</td>
</tr>
<tr>
<td></td>
<td>47.64 x 38.66 x 33.66 in</td>
</tr>
<tr>
<td>Shipping weight</td>
<td>140 kg - 63.5 lb</td>
</tr>
</tbody>
</table>

### Engraving displacement speed and acceleration

<table>
<thead>
<tr>
<th></th>
<th>IS900 IQ+ Machine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. engraving area</td>
<td>432 x 635 mm</td>
</tr>
<tr>
<td></td>
<td>17 x 25 in</td>
</tr>
<tr>
<td>Maxi. table surface</td>
<td>460 x 660 mm</td>
</tr>
<tr>
<td></td>
<td>18.1 x 26 in</td>
</tr>
<tr>
<td>Bridge clearance</td>
<td>80 mm - 3.15 in</td>
</tr>
<tr>
<td>According to the X axis:</td>
<td></td>
</tr>
<tr>
<td>Max. passage in X</td>
<td>Unlimited</td>
</tr>
<tr>
<td>Max. passage in Y</td>
<td>635 mm - 25 in</td>
</tr>
<tr>
<td>Max. thickness</td>
<td>20 mm - 0.79 in</td>
</tr>
<tr>
<td>According to the Y axis:</td>
<td></td>
</tr>
<tr>
<td>Max. passage in X</td>
<td>510 mm - 20.1 in</td>
</tr>
<tr>
<td>Max. passage in Y</td>
<td>Unlimited</td>
</tr>
<tr>
<td>Z spindle travel</td>
<td>80 mm - 3.15 in</td>
</tr>
<tr>
<td>Max. clearance of the tool-holder (without RDF)</td>
<td>4 mm - 0.16 in</td>
</tr>
<tr>
<td>Spindle pressure adjusting</td>
<td>Yes - 6 positions</td>
</tr>
<tr>
<td>Red pointer</td>
<td>Yes - LASER diode</td>
</tr>
<tr>
<td>RDF function (Surface following)</td>
<td>Yes</td>
</tr>
<tr>
<td>Max. defect of flatness of the plate with RDF</td>
<td>Slope of 15° max.</td>
</tr>
<tr>
<td>Clamping table</td>
<td>Yes</td>
</tr>
<tr>
<td>Max. thickness of fastening</td>
<td>10 mm - 0.4 in</td>
</tr>
<tr>
<td>Red pointer</td>
<td>LASER diode</td>
</tr>
<tr>
<td>X, Y max. engraving precision</td>
<td>0.05 mm - 0.002 in</td>
</tr>
<tr>
<td>Engraving repeatability</td>
<td>&lt; 0.05 mm - 0.002 in</td>
</tr>
</tbody>
</table>
**Engraving characteristics**

<table>
<thead>
<tr>
<th>IS900 IQ+ machine</th>
<th>X,Y</th>
<th>Z</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. spindle displacement speed - engraving -</td>
<td>Until 35 mm/s - 1.38 in/s</td>
<td>Until 40 mm/s - 1.59 in/s</td>
</tr>
<tr>
<td>Max. spindle displacement speed - diamond engraving -</td>
<td>Until 60 mm/s - 2.36 in/s</td>
<td>Until 100 mm/s - 3.94 in/s</td>
</tr>
<tr>
<td>Max. spindle displacement speed - off-load -</td>
<td>Until 100 mm/s - 3.94 in/s</td>
<td>Until 100 mm/s - 3.94 in/s</td>
</tr>
<tr>
<td>Max. spindle displacement acceleration - engraving and diamond engraving -</td>
<td>Until 700 mm/s² - 27.56 in/s²</td>
<td>Until 1000 mm/s² - 39.37 in/s²</td>
</tr>
<tr>
<td>Max. spindle displacement acceleration - off-load -</td>
<td>Until 1000 mm/s² - 39.37 in/s²</td>
<td>Until 1000 mm/s² - 39.37 in/s²</td>
</tr>
</tbody>
</table>

**Spindle and spindle motor**

<table>
<thead>
<tr>
<th>IS900 IQ+ machine</th>
<th>90W</th>
<th>200W</th>
<th>150W - HF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of motor</td>
<td>Brush DC</td>
<td>Brush DC</td>
<td>Brushless DC</td>
</tr>
<tr>
<td>Type of drive</td>
<td>Round belt (Ø3mm)</td>
<td>Notched belt</td>
<td>Direct</td>
</tr>
<tr>
<td>Output</td>
<td>42 W nominal</td>
<td>110 W nominal (150 W peak)</td>
<td>150 W</td>
</tr>
<tr>
<td>Max. rotation spindle speed</td>
<td>10000-20000 rpm</td>
<td>10000-20000 rpm</td>
<td>5000-60000 rpm</td>
</tr>
<tr>
<td>Type of spindle</td>
<td>Standard</td>
<td>Standard with collet</td>
<td>with collet</td>
</tr>
<tr>
<td>Type of nose</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acceptable tools</td>
<td>Ø4,36mm cutters and TwinCut</td>
<td></td>
<td>Ø2 - Ø3 - Ø3,17 - Ø4 mm</td>
</tr>
</tbody>
</table>

**Sound signal according to standard ISO 11201**

<table>
<thead>
<tr>
<th>IS900 IQ+ machine</th>
<th>90W</th>
<th>200W</th>
<th>150W - HF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waiting for engraving</td>
<td>LAeq dB (A)</td>
<td>75 ± 1</td>
<td>38 ± 1</td>
</tr>
<tr>
<td>Nominal engraving</td>
<td>80 ± 2</td>
<td>83 ± 2</td>
<td>89 ± 2</td>
</tr>
</tbody>
</table>

**Environment**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Operational temperature</td>
<td>min. +5 °C; +41°F - max. +40°C; +104°F</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>min. -5 °C; +23°F - max. +45 °C; +113°F</td>
</tr>
<tr>
<td>Degree of relative moisture when in use</td>
<td>5 to 85 %</td>
</tr>
</tbody>
</table>
**IS900 IQ+ Machine - Electronic Engraving machine**

### Point & shoot

<table>
<thead>
<tr>
<th>IS900 IQ+ machine</th>
<th>IS900 IQ+ machine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kind</td>
<td>LASER diode</td>
</tr>
<tr>
<td>Wavelength</td>
<td>630 - 680 nm</td>
</tr>
<tr>
<td>Max. output / Class</td>
<td>1 mW / Class 2</td>
</tr>
</tbody>
</table>

### Electrical and pneumatical characteristics

<table>
<thead>
<tr>
<th>IS900 IQ+ machine</th>
<th>Power supply (V)</th>
<th>Max. absorbed current (A)</th>
<th>Frequency (Hz)</th>
<th>Absorbed power (W)</th>
<th>Type of protection</th>
<th>Air (bar)</th>
<th>Insulation Type of service</th>
<th>Electromagnetic compatibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>90W</td>
<td>Input : AC 100 - 240 V</td>
<td>3.5 - 1.75</td>
<td>50 - 60</td>
<td>300</td>
<td>------------</td>
<td>2 x 10 A T</td>
<td>Classe I S1</td>
<td>Norm EN 55022 class B</td>
</tr>
<tr>
<td>200W</td>
<td>Input : AC 100 - 240 V</td>
<td>5 - 2.5</td>
<td>500</td>
<td>2 x 4 A T</td>
<td>2 x 4 A T</td>
<td>0.5 - 0.8</td>
<td>Norm EN 61000-3-2, EN 61000-3-3</td>
<td>Norm EN 61000-6-2 (industrial environment)</td>
</tr>
<tr>
<td>150W-HF</td>
<td>Input : AC 100 - 120 V / 200 - 240 V</td>
<td>5 - 2.5</td>
<td>500</td>
<td>2 x 4 A T</td>
<td>2 x 4 A T</td>
<td>0.5 - 0.8</td>
<td>Norm EN 61000-3-2, EN 61000-3-3</td>
<td>Norm EN 61000-6-2 (industrial environment)</td>
</tr>
</tbody>
</table>

### Connections - control panel - Links

<table>
<thead>
<tr>
<th>IS900 IQ+ machine</th>
<th>90W &amp; 200W</th>
<th>150W - HF</th>
</tr>
</thead>
<tbody>
<tr>
<td>USB</td>
<td>1.1</td>
<td></td>
</tr>
<tr>
<td>Parallel</td>
<td>26 - pin Mini - Delta Ribbon</td>
<td></td>
</tr>
<tr>
<td>Standard Inputs/Outputs</td>
<td>SubD 15 pins</td>
<td></td>
</tr>
<tr>
<td>Smart Spindle (Option)</td>
<td>Binder KFV - 12 pins (on the tool-holder of the machine)</td>
<td></td>
</tr>
<tr>
<td>Lubrication (Option)</td>
<td>Through the connections plate - Tube PU 4x6 + 1.5x2.5</td>
<td></td>
</tr>
<tr>
<td>200W rack (Option)</td>
<td>SubD9 &lt;=&gt; DIN8 + SubD9 &lt;=&gt; SubD9</td>
<td></td>
</tr>
<tr>
<td>Air inlet (air seal)</td>
<td>Through the connections plate - Tube PU 2x4</td>
<td></td>
</tr>
<tr>
<td>150W rack</td>
<td>SubD9 &lt;=&gt; DIN8 + FCI_CLIP9 &lt;=&gt; SubD9</td>
<td></td>
</tr>
<tr>
<td>Spindle</td>
<td>FCI_CLIP9</td>
<td></td>
</tr>
</tbody>
</table>

### Engraving softwares characteristics

<table>
<thead>
<tr>
<th>PC Engraving software</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engraving software</td>
</tr>
<tr>
<td>Operating system (for the engraving software)</td>
</tr>
<tr>
<td>Languages</td>
</tr>
<tr>
<td>File formats</td>
</tr>
</tbody>
</table>
## Optional accessories

### Vice

<table>
<thead>
<tr>
<th></th>
<th>IS900 IQ+ Vice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions</td>
<td>x mm x in</td>
</tr>
<tr>
<td>Net weight</td>
<td>kg - lb</td>
</tr>
<tr>
<td>Vice type</td>
<td>Removable, Manual, self centering</td>
</tr>
<tr>
<td>Jigs type</td>
<td>Plastic</td>
</tr>
<tr>
<td>Max. opening vice</td>
<td>230 mm - 9.05 in</td>
</tr>
<tr>
<td>Z max. clearance (jigs - spindle)</td>
<td>60 mm - 2.36 in</td>
</tr>
</tbody>
</table>
Appendices

Gravograph Machines Soft setup
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<td>1</td>
</tr>
<tr>
<td>MAKE A GRAVOGRAPH ROTARY MACHINE READY TO ENGRAVE</td>
<td>2</td>
</tr>
<tr>
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<td>5</td>
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<td>8</td>
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<td>11</td>
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<td>MAKE A GRAVOGRAPH LASER MACHINE READY TO ENGRAVE WITH A GRAPHICAL EDITOR</td>
<td>13</td>
</tr>
<tr>
<td>LEGAL TERMS</td>
<td>14</td>
</tr>
</tbody>
</table>
Gravograph Machines - Soft setup

How to make Gravograph machine ready to engrave

Install physically the machine on workspace, in accordance with Gravograph user manual.

- Locate the power button.
  - Button on 0: machine powered off, out of order
  - Button on I: machine powered on, ready to engrave

- Make a Gravograph rotary machine ready to engrave
- Make a Gravograph laser machine ready to engrave
- Make a Gravograph laser machine ready to engrave with LaserStyle
- Plug onto USB port an additional Gravograph machine
- Make a Gravograph laser machine ready to engrave with a graphical editor
Make a Gravograph rotary machine ready to engrave

This operation concerns rotary machines which rear side has these connectors

UC_Sirius
UC_K2000

A. Set up GT Smartstream driver onto your computer.
B. Set the softlink between PC and engraving machine. Make this connection using a cable you plug the connectors
   • either machine USB port and PC USB port
   • or machine serial port and PC COM port
C. Enable rotary machine in GravoStyle 5 or GravoStyle Quick Click engraving program.

Setting up GT Smartstream driver

1. Power off your(s) machine(s). Unplug from your PC.
2. Power up PC. Let Windows operating system start.
3. Run a session as Administrator.
   A standard user has no right to make a setup in Windows.
4. Have the digital media used to set up your Gravograph engraving program.
   A standard user has no right to make a setup in Windows.

<table>
<thead>
<tr>
<th>GravoStyle 5</th>
<th>GravoStyle Quick Click</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Set GS5 DVD into your PC drive</td>
<td>d. Plug GTSoft key onto one USB port of your PC</td>
</tr>
<tr>
<td>b. Right-click GS5 DVD</td>
<td>e. Double-click GTSoft key</td>
</tr>
<tr>
<td>c. Click Explore command in contextmenu.</td>
<td></td>
</tr>
</tbody>
</table>

5. In .\Driver\GT_Smartstream folder double-click setup.exe file. Follow the instructions posted by setup wizard.
6. Click the port used for the connection between your PC and your machine.
   Click the type of port to communicate with machine
   ✷ USB (is default and recommended)
   ❌ Other for COM port
7. When the driver and its components have already been set up on your computer, they are systematically deleted.
   > Deleting current driver...
8. A message notifies that driver is not Windows certified. To carry on setup in
   Windows Vista, click "Install driver anyway"  
   Windows XP, click Continue
Setting softlink between PC and engraving machine

<table>
<thead>
<tr>
<th>USB connection</th>
<th>1. <strong>Plug a single machine onto an USB port of your PC.</strong> Power up it.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><em>Plug machine onto port, power up it</em></td>
</tr>
<tr>
<td>2. The setup wizard checks the compatibility between GT Smartstream 3.xx and machine firmware (embedded program that carries out engraving instructions).</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• When compatibility is ok, the wizard jumps to step 4.</td>
</tr>
<tr>
<td></td>
<td>• Otherwise the last firmware version will be set up. Machine beeps when operation is over.</td>
</tr>
<tr>
<td></td>
<td>&gt; Updating firmware</td>
</tr>
<tr>
<td>3. Power off your engraving machine, then power up again.</td>
<td>&gt; Power off machine</td>
</tr>
<tr>
<td></td>
<td>&gt; Power up machine</td>
</tr>
<tr>
<td>4. <strong>The machine is automatically detected as new device</strong> on an USB port of your PC.</td>
<td></td>
</tr>
<tr>
<td></td>
<td><img src="image" alt="Click &quot;Software correctly installed&quot; in Software compatibility wizard of Windows Vista." /></td>
</tr>
<tr>
<td></td>
<td><img src="image" alt="In Windows XP Add new detected device wizard asks if devices plugged onto your PC should be checked." /></td>
</tr>
<tr>
<td></td>
<td>a. <img src="image" alt="Click &quot;Not this time.&quot;" /></td>
</tr>
<tr>
<td></td>
<td>Next&gt; Click.</td>
</tr>
<tr>
<td></td>
<td>b. The wizard asks if you expect Windows to set up machine driver.</td>
</tr>
<tr>
<td></td>
<td><img src="image" alt="Click &quot;Install software automatically (recommended).&quot;" /></td>
</tr>
<tr>
<td></td>
<td>Next&gt; Click.</td>
</tr>
<tr>
<td></td>
<td>c. <img src="image" alt="A message notifies that driver is not Windows certified." /></td>
</tr>
<tr>
<td></td>
<td><img src="image" alt="Continue" /></td>
</tr>
<tr>
<td></td>
<td>d. <img src="image" alt="Finish" /> Click when setup is over.</td>
</tr>
<tr>
<td>5. <strong>In Start menu or in Control panel double-click Printers:</strong> check that your machine is displayed as new GT Smartstream printer</td>
<td></td>
</tr>
<tr>
<td>6. <strong>Give this printer the name</strong> of your engraving machine.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>COM connection</th>
<th>1. <strong>Next&gt; Click. Configure your machine as Windows printer in Properties dialog box.</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&gt; Click Next to select the type of port to communicate with machine</td>
</tr>
<tr>
<td>2. <strong>Ports</strong></td>
<td>Click tab.</td>
</tr>
<tr>
<td>3. <strong>Click COM followed by the number of the port</strong> where you plugged the cable that links the PC and the engraving machine.</td>
<td></td>
</tr>
<tr>
<td>4. <strong>General</strong></td>
<td>Click tab.</td>
</tr>
<tr>
<td>5. <strong>Give this printer the name</strong> of your engraving machine followed by the selected port (for example COM1: or COM2:).</td>
<td></td>
</tr>
<tr>
<td>6. <strong>OK</strong></td>
<td>Click.</td>
</tr>
<tr>
<td>7. <strong>In Printers</strong> check that your machine is displayed as new printer</td>
<td></td>
</tr>
</tbody>
</table>
### Enabling laser machine in your Gravograph engraving program

**GravoStyle 5**

1. ![GravoStyle](image)
   - Double-click in Start menu to run the program.

2. ![GravoStyle](image)
   - Click tab

3. ![GravoStyle](image)
   - Open Machines: click Config. machines command in Engraving menu.

4. ![GravoStyle](image)
   - Click Add machine.

5. ![GravoStyle](image)
   - Click your machine type.

6. ![GravoStyle](image)
   - Right-click your rotary machine exact name.

7. ![GravoStyle](image)
   - Click Add machine command in contextmenu.

8. ![GravoStyle](image)
   - In Installed printer list click printer named exactly like your engraving rotary machine.

9. ![GravoStyle](image)
   - Click in Setup output dialog box.

10. ![GravoStyle](image)
    - Click in Machine Properties dialog box.

   Your machine is active in installed printer list.

**GravoStyle Quick Click**

1. ![GravoStyle](image)
   - Double-click in Start menu to run the program.

2. ![GravoStyle](image)
   - Click in Step panel to display Composition screen.

3. ![GravoStyle](image)
   - Click a ruler to display plate parameters.

4. ![GravoStyle](image)
   - Click your rotary machine exact name.

5. ![GravoStyle](image)
   - When you have several GT Smartstream printers click the printer named like your machine.
Make a Gravograph laser machine ready to engrave

A. Set up Gravograph L-Solution driver onto your computer.

B. **Set softlink between PC and engraving machine.**
   Make this connection using a cable you plug the connectors
   either onto machine USB port and PC USB port
   or machine serial or parallel port and PC LPT or COM port

C. **Make the machine ready to engrave with the program used to produce engraving.**
   • either LaserStyle Gravograph software
   • or a graphical editor like Corel Draw™, AutoCad™ or Adobe Illustrator™

### Setting up L-Solution Gravograph driver

1. Power off your(s) machine(s). Unplug from your PC.

2. Power up PC. Let Windows operating system start.

3. **Run a session as Administrator.**
   A standard user has no right to make a setup in Windows.

4. Set into your PC drive **the disk used to install the driver.**

   **GravoStyle**
   ![Explore contents of support iconized as a driver identified by a letter in Computer (for example F: or H:).]
   ![a. Right-click GSS DVD](a.png)
   ![b. Click Explore command in contextmenu.](b.png)
   ![c. In \Driver\LSolutionxx folder double-click setup.exe file. Follow the instructions posted by setup wizard.](c.png)

   **L-Solution**
   ![Double-click L-Solution CD delivered with your machine.](l.png)

5. Click the **port used for the connection between your PC and your machine.**
   ![Click the type of port used to communicate with machine](port.png)
   ![USB (is default and recommended)](usb.png)
   ![Other for COM or LPT port](other.png)

6. **When the driver and its components have already been set up** on your computer, they are systematically deleted.
   > Deleting current driver...

   **When deleting failed, Windows reboots. Restart full setup of L-Solution driver.**

7. **A message notifies that driver is not Windows certified. To carry on setup in**
   ![Windows Vista, click "Install driver anyway"](vista.png)
   ![Windows XP, click Continue](xp.png)
Setting softlink between PC and engraving machine

USB connection

1. **Plug a single machine onto an USB port of your PC.** Power up it.
   - Plug machine onto port, power up it

2. The setup wizard checks the compatibility between L-Solution 5.xx-3 and machine firmware (embedded program that carries out engraving instructions).
   - When compatibility is ok, the wizard jumps to step 4.
   - Otherwise the last firmware version will be set up. Machine beeps when operation is over.
   - Updating firmware

3. Power off your engraving machine, then power up again.
   - Power off machine
   - Power up machine

4. **The machine is automatically detected as new device** on an USB port of your PC.
   - Click "Software correctly installed" in Software compatibility wizard of Windows Vista.
   - In Windows XP Add new detected device wizard asks if devices plugged onto your PC should be checked.
     a. Click "Not this time."
        - Click.
     b. The wizard asks if you expect Windows to set up machine driver.
        - Click "Install software automatically (recommended)."
        - Click.
     c. A message notifies that driver is not Windows certified.
        - Click.
     d. Finish Click when setup is over.

5. **In Start menu or in Control panel double-click Printers:** check that your machine is displayed as new L-Solution printer.

6. **Give this printer the name** of your engraving machine.
1. **Next** Click. Configure your machine as Windows printer in **Properties dialog box.**
   > Click **Next** to select the type of port to communicate with machine

2. **Ports** Click tab.

3. Click the port onto you plugged the cable that links the PC and the engraving machine.
   **Click LPT or COM, followed by the port number.**

4. **General** Click tab.

5. **Give this printer the name** of your engraving machine followed by the selected port (for example LPT1: or COM2:).

6. **OK** Click.

7. **In Printers** check that your machine is displayed as new printer.
Make a Gravograph laser machine ready to engrave with LaserStyle

A. Set up Gravograph L-Solution driver onto your computer.

Use GS5 DVD to set up driver.

B. Set the softlink between PC and laser machine.

C. Make your laser machine ready to engrave with LaserStyle Gravograph software.
   • Check the USB port assigned to L-Solution printer you have just added.
   • Set up GT Smartstream driver for data exchange between LaserStyle and your laser
     machine.
   • Enable your laser machine in LaserStyle engraving program.

Checking the USB port assigned to L-Solution printer you have added
1. In Start menu or in Control panel double-click Printers.
2. Right-click the printer you have named like your laser machine.
3. Click Properties in context menu.
4. Click Ports Click tab.
5. In Port list, locate USB port ticked.

Setting up GT Smartstream driver for Gravograph laser machine
1. In Start menu double-click Printers.
2. Click Add printer command in File menu.
3. Add printer wizard opens.
   Next> Click.
4. Click Local printer (Plug & Play box unticked).
   Next> Click.
5. Click USB Port assigned to L-Solution printer.
   Next> Click.
6. Locate GT Smartstream driver.
   a. Have disk Click.
   b. Browse Click.
   c. Double-click GS5 DVD
   d. In .\Driver\GT Smartstream folder click GT_Smartstream.inf file.
   e. OK Click.
How to carry on when GT Smartstream 3.xx driver is already set on your computer?

a. Click Gravograph Manufacturer.
b. Click GT Smartstream3.xx. Printers driver.
c. Next> Click.
d. Click Keep existing driver.
e. Next> Click.
f. Finish Click.
Enabling laser machine in LaserStyle

1. Double-click in Start menu to run the program.

2. Click tab

3. Open Machines: click Config. machines command in Engraving menu.

4. Click Add machine.

5. Click your machine type.

6. Right-click your laser machine exact name.

7. Click Add machine command in contextmenu.

8. In Installed printer list click L-Solution printer named like your laser machine.

9. Click in Setup output dialog box.

10. Set your laser machine properties in L-Solution Installation dialog box:
   a. Click the Bridge that fits your machine.
   b. Click ports available on your machine:
      USB
      COM/LPT
   c. Click Laserpower (from 30 Watts, see plate at machine rear side).
   d. Click (more information in Gravograph manual delivered with laser machine).

11. Click.

12. In Installed printer list click GT Smartstream port named like your laser machine.

13. Click in Setup output dialog box.

14. Click in Machine Properties dialog box.

Your machine is active in installed printer list.

January 8, 2009
Plug onto USB port an additional Gravograph machine

Use MajFirmware.exe tool to control and to configure the parameters of the additional machine, before connecting it onto an USB port of your PC.

⚠️ To connect onto USB ports several Gravograph machines, your PC must have at least 4 USB ports free.

⚠️ To connect onto USB ports a rotary machine, then a Gravograph laser machine

A. 🛠️ First make rotary machine ready to engrave.
B. 🛠️ Then make laser machine ready to engrave with LaserStyle.

Running MajFirmware.exe tool

1. Power off first machine. Unplug from PC.
2. Plug only the additional machine onto an USB port of your PC. Power up it.
3. Run MajFirmware.exe tool from the digital media used to set up your Gravograph engraving program:

<table>
<thead>
<tr>
<th>GravoStyle 5</th>
<th>GravoStyle Quick Click</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Right-click GS5 DVD</td>
<td>a. Double-click GTSoft key</td>
</tr>
<tr>
<td>b. Click Explore command in contextmenu.</td>
<td>b. In .\Firmware folder double-click MajFirmware.exe file.</td>
</tr>
<tr>
<td>c. In .\Firmware folder double-click MajFirmware.exe file.</td>
<td></td>
</tr>
</tbody>
</table>
Updating additional machine firmware

When the driver that matches the additional machine has been already set up on PC check its compatibility with this machine firmware.

1. Run MajFirmware.exe tool.

<table>
<thead>
<tr>
<th>Machine configuration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name: IS400 PNS</td>
</tr>
<tr>
<td>Firmware: 2.61</td>
</tr>
<tr>
<td>Number: Unknown</td>
</tr>
</tbody>
</table>

   Update

2. Check Number parameter. When value is
   a number: firmware and driver are compatible. Cancel Close dialog.
   "Unknown": firmware and driver are not compatible. Update firmware.
   a. Update Click opposite Firmware parameter.
   b. Double-click the file that will update firmware:

      - Rotary only
      - \Firmware\UC_Sirius\vp_prog.dos
      - Rotary or Laser
      - \Firmware\UC_K2000\vp_prog.dos
   c. Send file to machine Click to send the file. Machine beeps when operation is over.
   d. Exit Click.

Differentiating two same named-machines

The additional machine has the name of a machine formerly set up.

1. Run MajFirmware.exe tool.
2. Update Click opposite Number parameter: type a different number for each additional machine.
   0 value remains the number of the first machine set up.
3. Exit Click.
Make a Gravograph laser machine ready to engrave with a graphical editor

1. Set up Gravograph L-Solution driver.

   **To set up driver use L-Solution CD delivered with your machine.**

2. Set the softlink between PC and engraving machine.

3. Open a new document in your **usual graphical editor** (Corel Draw™, AutoCad™, Adobe Illustrator™, etc.).

4. Set objects to engrave (text, vectorial logos, bitmap images).

5. Set each object properties (contour thickness, surface, color).

6. **Enable Print command.**

7. In Printer Selection, **click the printer named exactly like your engraving laser machine**.

8. **OK** Click.

9. **Configure laser engraving using L-Solution dialog box commands** (more information in Gravograph manual delivered with laser machine).

January 8, 2009
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