

ALLINSIDE

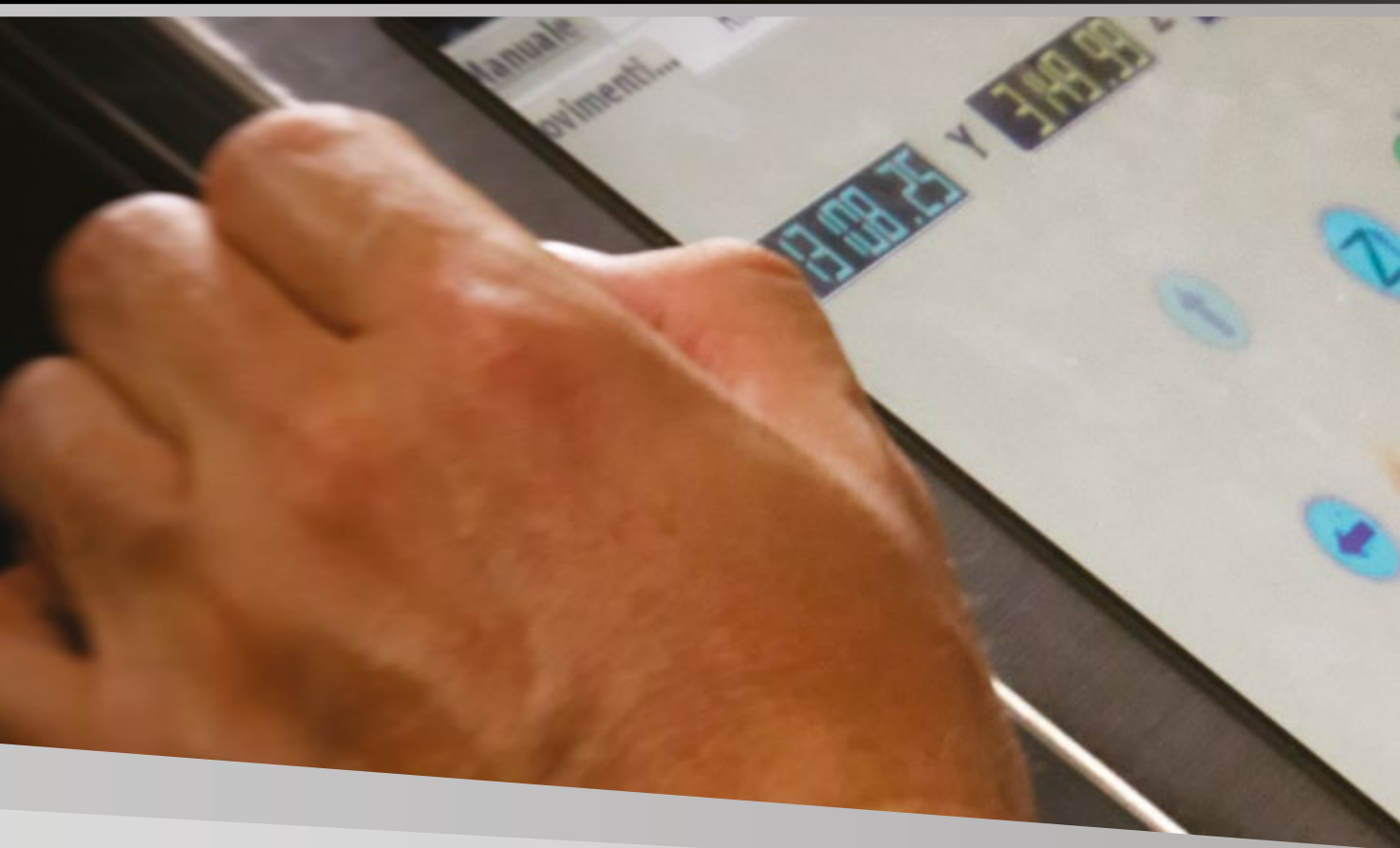


Simplicity
and power

 **Emaker**
vertical solutions for cutting machines



 **EUROSOFT**

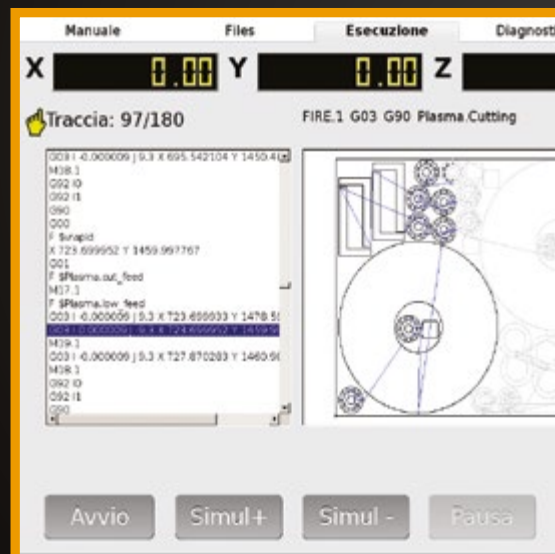


ECP1000

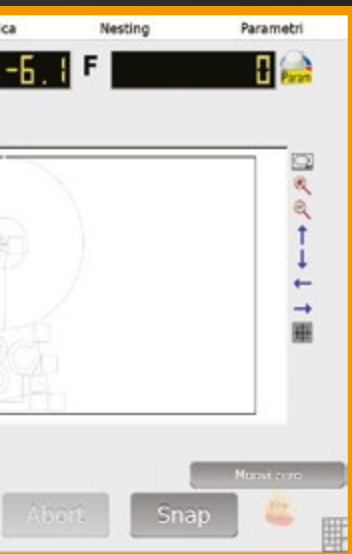
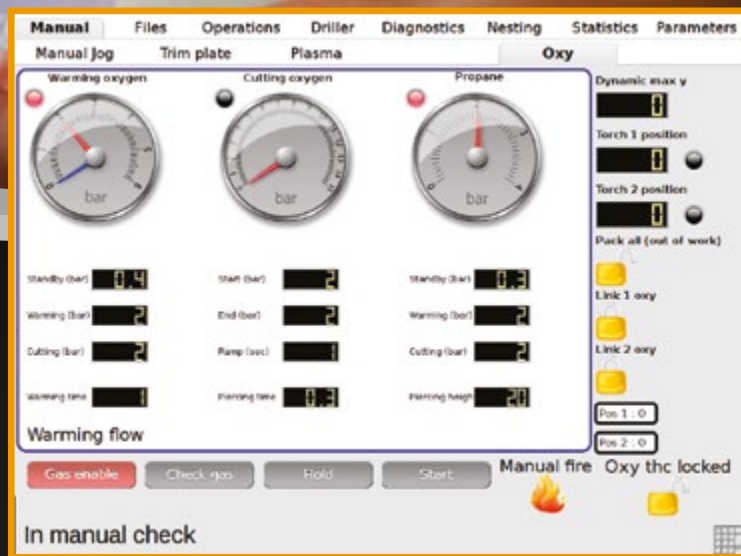
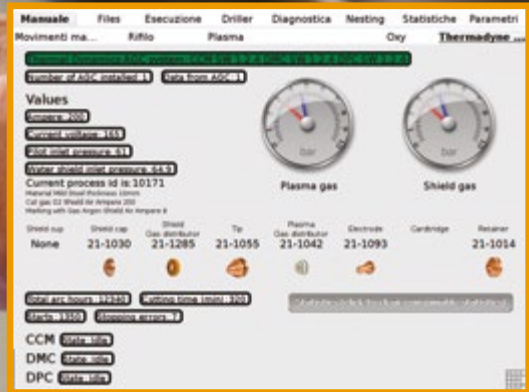
full control

Eurosoft has gathered the experience of over 20 years in the cutting field in a single product that, thanks to EtherCAT technology (industrial sector bus characterized by flexible topology, advanced performances, low costs and simplicity of use) does not put practical restrictions on the number of motors to control and on I/O terminals.

Never seen performances in every classic type of cut (laser, plasma, oxyfuel...) usable by a simple configuration of the product, make ECP1000 one of the best amongst the systems on the market.



Ethercat[®] is a registered trademark and patented technology, licensed by Beckhoff Automation GmbH, Germany



Eurosoft has been using for years the operative system Linux with real-time extensions RTai with success.

The efficiency of the chosen system allowed to use the same CPU for the user interaction (graphic program for dialoguing with the operator), for the configuration of the system and for the most important task: to control the machine and its motors in order to get the less costs and damages possible and in general a software reliability of embedded systems without inheriting their limits.

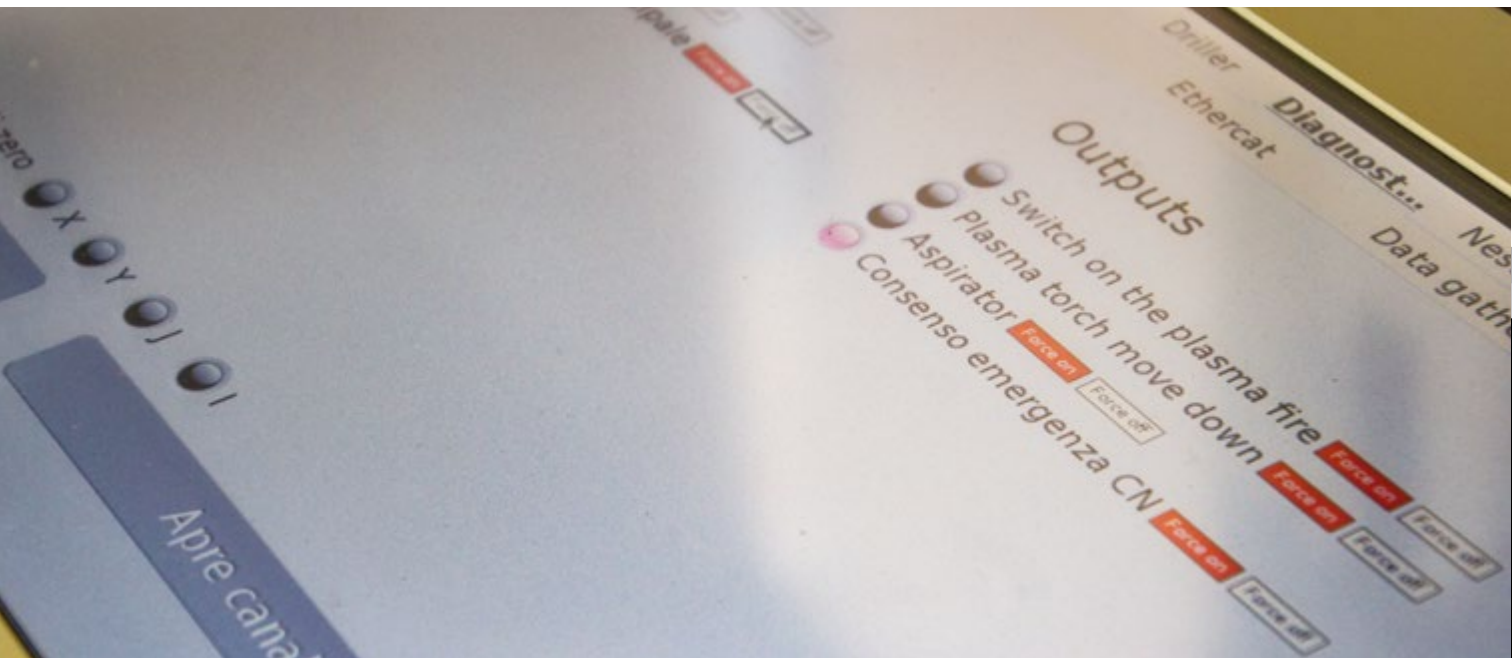
Main FEATURES

The input to the system are programs in ISO format. Instructions read from the ISO program are listed and clearly visible on the screen, but for the normal operator it suffices to consider only the different cut planes and tracks (paths).

Given the large number of predefined configurations, each of which is easily customizable further, the system is extremely flexible and can be adapted to all the possible cases. Some existing configurations are illustrated in the following, many others are possible.

Integrated communication directly to the Plasma source, so that the ECP-1000 system displays real-time information about the cut process (gases, current, cooling system – every bit of information).

This makes it unnecessary to install additional control panels available as expensive options for many common Plasma sources.



- Zero and rotation management
- Very easy management for restarting a cut that was interrupted, with user friendly movement back and forth on the track path, with optional automatic insertion of a new lead-in at the point of restart
- Snap to track and restart – it suffices to move the torch near the point of restart, the current position will be projected on the nearest point of a track
- Possibilità di muovere la macchina durante le situazioni di pausa programma
- Complete freedom of moving the machine after putting the cutting program in pause, for any maintenance that could be necessary
- Immediate adjustment of every main cutting

parameter: feed rate, arc voltage, piercing time and so on, with no delay change of the cutting process

- Shapes Library with many useful common 2D parts
- Internal database for cutting processes and raw material sizes
- Real-time recording of actual and programmed position of the motors during the execution, with easy display on the system panel.
- VPN (Virtual Private Network) based Desktop Sharing for remote assistance
- Integrated nesting function for immediate reuse of drawings available in Dxf/Dwg (Auto-cad TM) standard formats

Specialized I/O CARD

The **ECP1000** system can use a wide choice of commercial I/O terminals; Eurosoft, as a member of the **Ethercat®** consortium, develops specialized I/O terminals with excellent price/performance ratio.

I/O system is based on an Ethercat bus coupler (ETC-BUS) that implements a local bus for I/O expansions (up to 3 modules: 16 IN / 16 OUT) up to a total of 56 IN, 56 OUT. ETC-BUS has 8 IN + 8 OUT and is enough to make simple machines.

ETC-BUS has a fiber optic connection to which the ETC-VA special board can be securely connected.

Multiple **ETC-BUS** systems can be connected to the same CN system (this is useful for creating systems with multiple ETC-VA cards).

The ETC-VA card allows the interfacing of plasma generators of any brand in a simple and safe way:
Arc voltage input for protected height control for direct or split voltage

Analogic protect input for ohmic contact and collision (possibility to set trigger level as a cnc parameter, without any installation of resistor based voltage dividers)

Dry contacts outputs compliant to plasma standards certification

4 dry contacts outputs configurable for plasma controls

4 dry contacts outputs reading plasma state

Serial communication protocols RS422 and RS485 for connection to the generator; it is important to note that using this card you do not have to use a CN serial port, nor you must link CN to generator.

ETC-VA can be connected to ETC-BUS, in addition to optic fiber (useful for positioning within the plasma generator), also directly on the BUS (internal frame installation).



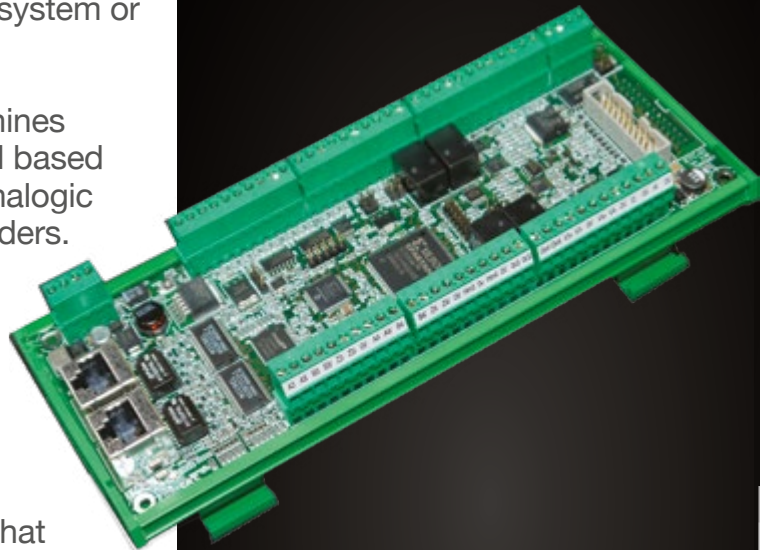
Plasma unit

4 axis

Ethercat[®] CONTROL board

One single board is enough to connect up to 4 motor drives by analogic signals (DC voltage speed reference, plus encoder feedback pulses). It can be driven by an ECP-1000 system or any other EtherCAT[®] master.

Even if the digital field buses are used for new machines more and more, a large number of machines are still based on traditional solutions for the motor drivers, with analogic speed reference and feedback by pulses from encoders. Especially when retrofitting a machine, it is often required to re-use the existing motor drivers. ETC-01 leverages these situations and also allows the building of mixed, hybrid solutions in which both traditional and new technologies coexist. Such a hybrid solution can provide for an initial mix of traditional and newer motor drives, allowing for a later change of the mix. It is very important to note that similar choices are driven by cost considerations and will always be made in order to continue to use drivers that are still working perfectly. Supposing that the hybrid solution is used to retrofit an existing machine, then at a later time, when one of those traditional drivers has to be replaced because of the normal wearing down, very probably the choice about a new driver will lead to a native EtherCAT driver. But the hybrid solution can be used also to update the design of machines that are still currently produced for highly cost sensitive markets, initially introducing EtherCAT drivers for a few selected motors and maintaining more traditional drivers for the less important motors for some time. Other motors can be later promoted to use native EtherCAT drivers when the difference of cost is in favor of the EtherCAT versions.



Main TECHNICAL DATA

Fieldbus	Ethercat
CanOpen device profile	DS301
Synchronization	Distributed clock
Sampling rate	1 KHz
Channels number	4
DACs	16 bit
Encoder	32 bit A,A/B,B/Z,Z/
Home inputs	24V DC or dry contact
Drive enable outputs	24V DC or dry contact
Power supply	24V DC
Drive OK inputs	24V DC
Reset drive outputs	24V DC



Motor and Drivers

Using the ethercat fieldbus allows you to choose a wide range of motors and drivers. Being able to interact between a large and growing number of suppliers allows us to choose among the cheaper options.

The use of Ethercat offers enormous advantages over proprietary protocols and those that are not very suitable for motion.

It is very important to emphasize that it is possible to mix between different brands of engines and drives even on the same machine.

Typical is the case of different choices for Z axis motorization over the main axes.



Plasma and Oxy



Using cutting machines with plasma/oxy technology very often happens to stop cutting for different reasons (change of consumables, torch collision on a cut piece, problems with gas, etc.). The simplicity with which these situations are handled strongly affects the percentage of machine stops and overall the degree of satisfaction with the use of the system.

Oxy

- Management with on/off or proportional valves
- Retrace function on cutting loss
- Technological database
- Press ramps on cut/piercing
- Moving piercing
- Automatic packaging
- Capacitive control management
- Cutting feedrate adjustment
- more

Plasma / Drilling Units

- Multiple modes for restart the cut, with automatic attachment
- Cutting height control
- Technological database
- Gas console management for the main plasma generators
- Immediate adjustment of every main cutting parameter
- Automatic trim and manual cutting functions
- Radio control
- Smoke suction with motorized extractor hood
- Pipecut
- Drilling units management with rigid tapping cycles
- Functions for plates research and realignment
- Cutting feedrate adjustment and more...

Plasma bevel

Using a plasma to make bevel machining is not a simple operation.

In fact, anyone who has experience will agree that excellent results can be obtained through manual corrections.

Even if you have a perfect mechanics, the plasma cutting process, with varying angles and materials, is characterized by different values depending on: cutting width, arc tension to maintain an optimum height and effective cutting angle for each material, for each thickness and also for bevel cutting type.

Compared to the straight cut, the bevel opens completely different scenarios: when using a new material or a new thickness, it is necessary to perform tests to achieve the desired result and use CAD/CAM system to make the changes.

In addition, the electrode wear that normally only involves an unsuitable working height, in this case leads to size errors, and in the case of bevel work the exceeds the permitted tolerance.

ECP1000 proposes a different approach where fixes are made directly in the machine, using a powerful technology database and using a powerful geometric engine directly on the numeric control.

In addition to obvious considerations regarding the savings time to not having to act on the CAD/CAM system, it is clear that this approach is more practical and effective.

Corrections are also saved in the CN technology database and can be used later to reset the program correction times for the used material/thickness .

In addition to corrections related to process startup settings, the program can be corrected automatically according to the actual material thickness.

A function for measuring the electrode wear and consequent automatic compensation is also implemented.

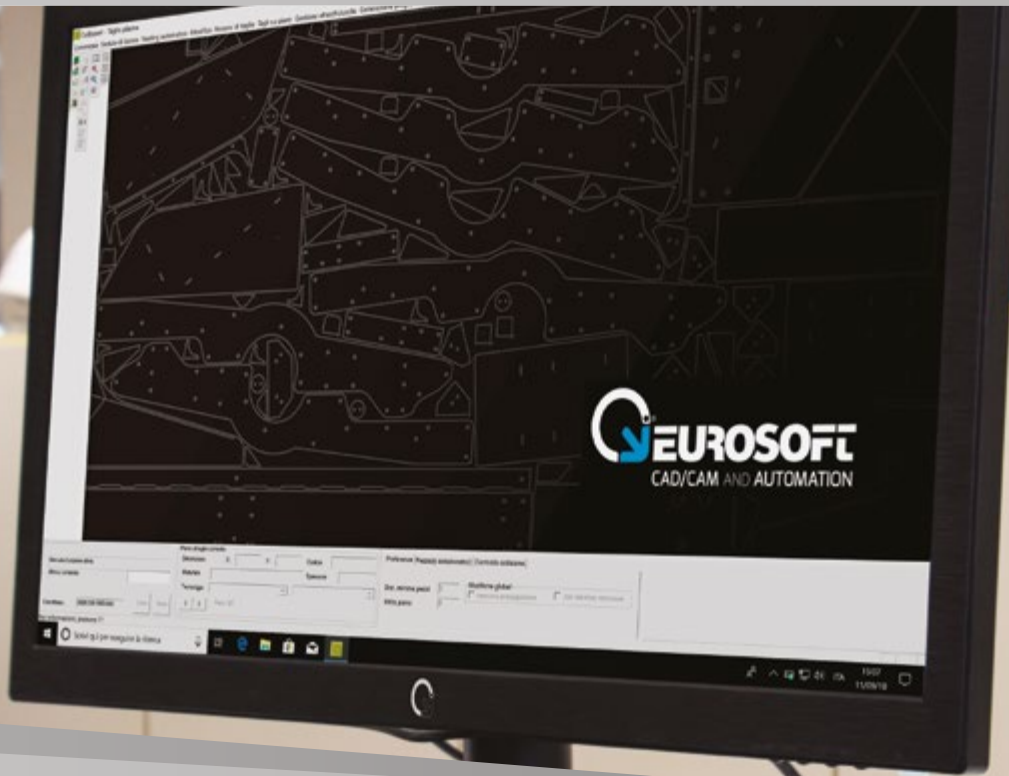
The correction function requires the use of CutExpert as a programming system.

Laser

The same hardware platform, some Ethercat I/O terminals, a quality engine choice and ECP1000 can be used to make laser systems.

Basic thermal cutting capabilities are also suitable for laser cutting, especially for:

- Modulation of laser power as a function of speed
- Modulation of PWM parameter for the differentiated management of the piercing phases
- Gas pressure control with proportional valves
- Integrated management of capacitive control
- Special process management for pre-piercing, vaporization
- Realtime control of cutting parameters
- Realtime control of the laser source parameters



cut expert[®]

CAD/CAM Suite

Maximizing the product for any given quantity of raw materials is a must for every enterprise, in order to maximize the profitability.

It is a common opinion that only a human operator can achieve the best savings on raw materials.

While this opinion can have a solid base for certain aspects of production planning, every year the continued enhancement of computers is making it easier to use software programs to search and evaluate a huge number of combinations for the placement of the workpieces over a sheet, achieving a great efficiency in material saving within acceptable elaboration times.

Of course, the automatic placement of the workpieces must not preclude the possibility of manual interventions, for example in order to

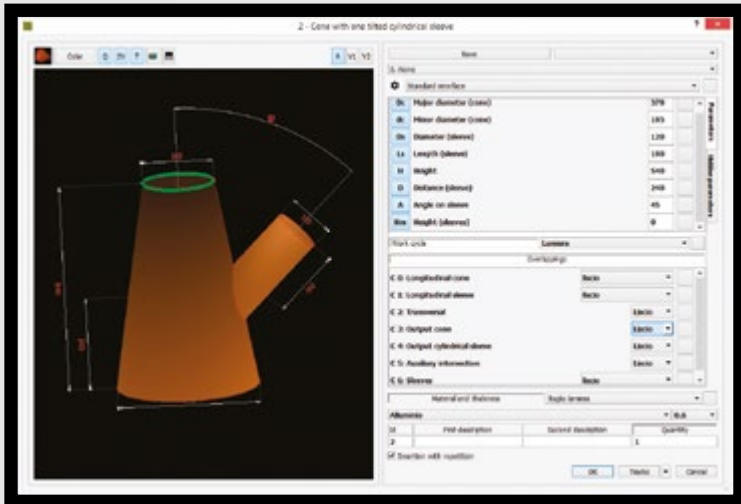
delete from a certain sheet some pieces that were mistakenly allotted on that sheet. But also, the automatic procedure must be able to continue the job of workpiece allocation after that part of this job has been modified manually.

Moreover, in order to achieve the highest efficiency, it must be possible to allocate workpieces coming from different orders on the same sheet, so that the savings of the material improves. Of course, after the cut has been done it must be easy to remember which sheet had included part X of job Y.

This is why the integration of job management with nesting operations is so important.



The software suite for CUTTING



A complete solution coming from more than 20 years of experience with thermal cutting machines and many positive cooperating partnerships with machine makers.

A solution used by hundreds factories and workshops to produce metal frameworks and HVAC ducts, with their complete satisfaction.

Definitely a leader solution

Simplicity

- Maximum ease : no special requirements, no special computer skills, there is no need of specially trained operators
- The training period is really short : the operators can actually begin to work within a few hours
- Modern and pleasant graphical interface
- Contextual menus: lthe operations that are shown are the ones really useful for the current situation
- Unlimited Undo and Redo
- Predefined and expandable set of print modules to report every aspect of the production : even for preliminary evaluation of production cost
- Integrated environment to control all together : job management, automatic or manual workpiece placement, cut technologies, work sequence, translation of the cutting program for the final target machine
- Fast and powerful nesting module: saving raw material is a must

The Cam module

The CAM module integrates all the functions needed to quickly program the work sequence of the machine for all the possible cases: bevel cut, drilling units for perfect holes, support for plasma or laser or oxyfuel cutting heads, marking units, punching devices.

Very fast routing of the work load. The software determines automatically the cutting head that best matches a certain track of a workpiece, the decision is driven by a large and powerful set of preconfigured rules, so that optimal results are obtained with minimal user intervention.

A similar set of preconfigured rules drives the choices about lead-ins and lead-out, kerf width compensation, other cutting parameters that depend on the actual cutting head, all of this depending on the thickness and type of raw material, to achieve optimal results with minimal user intervention.

The cutting sequence is also automatically chosen after a set of preconfigured rules, for example it is possible to force the execution of holes and marking to happen before the cut of the workpieces.



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vertical solutions for cutting machines
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cut expert®
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Mosaico
art of nesting
- 
Revolution 4.0
- 
ECP 10000
controller for cutting machinery
- 
Training
learn with me



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