



CNC TURNKEY



CNC Turnkey - Technology for Woodworking and Metalworking

The OSAI CNC Turnkey is a complete system including CNC, HMI, I/Os and servo-drives, installed and pre-wired in a compact electrical cabinet.

OSAI software allows the use of the CNC Turnkey in several fields: laser/plasma/oxy cutting, metalworking centers, woodworking machines and wood panel manufacturing.

Designed to be installed both on new machines and for the retrofits of machines equipped with outdated CNCs, the OSAI CNC Turnkey is an ideal solution for OEMs and System Integrators.

All electronic and electrical components are already interconnected with one another. The system can also be supplied with servomotors with their interconnection cables. It can be configured according to the specific customer requirements and it is pre-tested before shipping.

The whole system uses fast digital interfaces, in particular, the Ethercat fieldbus at 100 Mbaud connects the CNC, the servo-drives, the I/Os and the control panel.

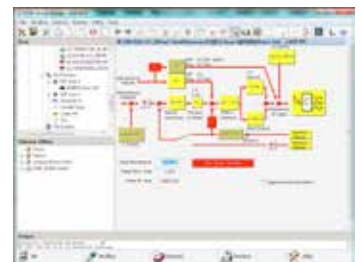


The basic package is equipped for three axes and it can be increased up to a maximum of 8 axes or 4 axes and a spindle inverter. It can be ordered with AC brushless servo-motors (230V or 400V) from 0,2 Kw to 3 Kw.

In case of retrofits, the new OSAI OD700 EtherCAT servo-drives included in the package can pilot already existing AC brushless servomotors with a relevant saving both in economic terms and in terms of installation time.



The Windows based front-end allows the operator the typical flexibility of the PC environment, together with the reliability of an industrial CNC. The ODM (OSAI Device Manager) used in this environment is a graphical system for machine tuning including the AMP (Adjustable Machine Parameters) with which the integrator can manage the entire basic configuration, the geometry and the machine kinematics.



All this also allows low cost connection through internet from a remote position for the assistance, checking or modification of each parameter related to the CNC, drives and motors.

Standard Logic

The OSAI CNC Turnkey is ready to use not only regarding the hardware; in fact, it is offered with a complete preset machine logic program (active on the SoftPLC integrated in the CNC), which allows rapid commissioning and considerable reduction of the time to market of the machine.



Optional module for the safe management of the machine emergencies.



Up to 2 optional Joysticks for the movement of machine axes or for customized functions.



CNC OPENcontrol with I/O OPENrio SL modules.

Operator Interface

Standard operator interface composed of a 15" LCD compact panel with Touch Screen, keyboard, touch-pad and integrated operator pushbuttons to ensure highest ergonomics and efficiency of the machine tool.

It is possible to host a commercial PC (PC, Monitor, Keyboard and mouse) through a mechanic adaptation kit that guarantees the ergonomics in applications that require high calculation power for the CAD/CAM

on-board execution, or very sophisticated operator interfaces, or to optimize the total machine cost.

The CNC Turnkey can also be supplied with the remote interface TOP5, a portable terminal including a 6.5" touch screen LCD display, electronic handwheel, operator pushbuttons, emergency push-button and USB port for program loading.



Turnkey configuration with Office PC.

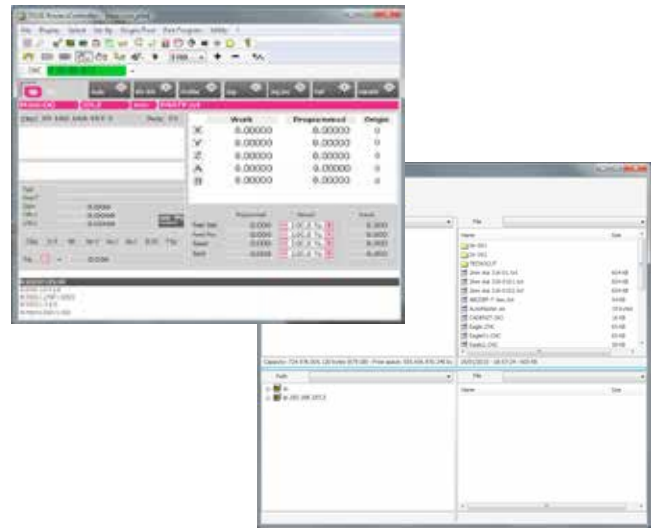


OPENcontrol Software

The CNC TURNKEY can be supplied with:

- flexible OSAI basic graphical HMI software, which can be easily and completely customized
- specific OSAI OPENCut software for machines dedicated to metal sheet cutting using Laser, Plasma or Oxy fuel
- OSAI OPENMill software for machining centers dedicated to metalworking.

Advanced functions for woodworking are available for both 2D working and 5 axes machines dedicated to 3D working.



CNC Software Key Features

Axes Management

- Coordinated, Auxiliary, Pseudo and Spindle axes
- Linear and Rotary Axes
- Rollover Axes
- Diameter Axes
- Gantry Axes (Split)
- Dual Axes
- Master/Slave axes
- Dynamic follower axes

Special Features

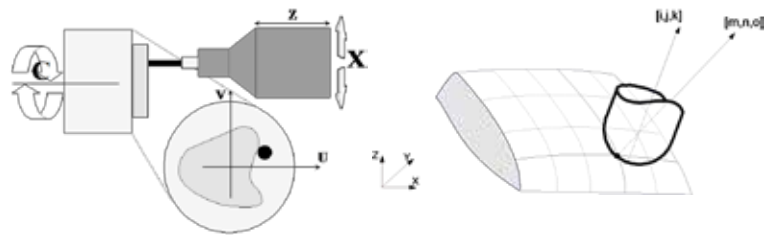
- Multi-Axis Electronic Cam
- Cross Compensation
- Bidirectional lead screw compensation
- Volumetric Compensation

Virtualization

- Programming on Rotated Plane
- Polar Coordinates
- Cylindrical Coordinates
- Non orthogonal axes management

3D Axes Motion

- Circular 3D interpolation
- Tangential axis control
- Tool Centre Point (TCP)
 - TCP for Double Twist and Prismatic Heads with 2 or 3 rotary axes.
 - TCP for non-standard kinematics
 - TCP with Spline (High Speed Machine)
 - Tool Direction axis movement
 - TCP on rotated planes
 - Selection of active kinematics by program



Axes Motion

- Linear, Circular, Helical and Spline Interpolation
- Motion Modality (RAMP parameters)
- Independent acceleration/deceleration parameters for
 - Linear Ramp
 - S Ramp
 - Trapezoidal Ramp
 - S Ramp with Jerk limitation
- Point to Point and various Continuous Mode
- Look Ahead
- Axis motion filters programming
- Velocity Feed Forward (VFF)
- Zero Shift
- Constant or Variable Pitch Threading (G33)
- Multi-start threading
- Multi Block Retrace
- Memory Search (Restart)

Various

- Change of the measuring unit
- Shared Axes
- Axis Migration
- Parametric (macro) language
- Machining canned cycles
- Probing cycles
- Part-program subroutines
- XML macro interpreter

OPENCut Plasma Software

OPENCut Plasma is an advanced HMI and CAM software that manages both the execution of programs generated by CAD and the parametric and local graphic programming through preset profiles not requiring any knowledge of the ISO programming used by the CNC. OPENCut develops according to user requirements, from the 2D cut and the manual nesting to the completely automatic Bevel applications. As common in OSAI products, OPENCut is in fact organized as a modular software.

Furthermore:

- DXF and DWG files import. Double torch management (Plasma) Multiple torch management (Oxy)
- management of Drilling and tapping heads
- Automatic or manual repositioning and restart after an error

- Torch collision detection
- Manual cutting
- Part interference detection and automatic correction
- Calculation of the cycle time
- Bevel cutting management

A machine logic specifically designed for Plasma and Oxy cutting, flexible, adaptable and perfectly coordinated with the CAM Software, allows a rapid application of the system.

Already integrated in the system are functions, such as automatic torch height control, dynamic regulation of Plasma power according to the speed and automatic management of the working table with aspiration system divided in zones, that allow rapid tuning of the machine.



Library with preset 2D parts.

Conversational programming based only on graphical elements and geometric data.

True shape nesting of different parts. Automatic definition of cutting parameters. Automatic lead-in/lead-out placement.

Graphic preview of the Profile and dynamic display of the torch position and path.

On-board cutting technology database.

3D realistic simulator.

OPENCut Laser Software

OPENCut Laser shares with OPENCut Plasma all the basic functions for metal sheet cutting and includes many advanced functions for Laser machining:

Laser source

- Support of more common laser sources:
- Laser power control with dedicated hardware
- Modulation of beam-on signal

Gas management

- N₂, O₂, Air, high pressure N₂
- Gas pressure automatic control with feedback signals
- Functions to stabilize gas pressure
- Configurable gas management device calibration

Laser heads

- Supports the most common height control modules on the market

Metal sheets loading system

- Support of various sheet loading systems and magazines

Machine functions

- Technological database integrated in the CNC
- Marking

- Film burn
- Various piercing modes
- Micro-joint along X and Y directions
- High speed cutting without piercing
- Multi-line cutting
- Automatic and manual definition of the displacement angle of the sheet on the working table
- Customizable works instructions
- Restart mode:
 - Backwards movement along the profile (backtrace)
 - Axes manual movement and restart
 - Icon/profile selection
- Selectable dynamics for each working
- Cutting parameters selection “on the fly”
- Configurable diagnostics and programmed maintenance, with customized pages
- Automatic selection of the technologies.



OPENMill Software

OPENMill software is a direct and intuitive environment for programming and management of milling machines. It manages the execution of programs defined by a local graphic and parametric programming and it includes a conversational editor, characterized by extreme ease of use, allowing several preset cycles besides the definition of profiles on the plane through geometrical graphical elements.

OPENMill is also the new OSAI HMI interface dedicated to milling. The end-user environment, specifically

designed to expedite CNC use, requires few commands, from soft-keys or touch-screen, to use the main functions of the CNC and disposes of integrated graphics with part preview for program selection and real-time graphics to highlight the parts being processed.



Selection of the preset cycle.



Setting of the geometrical parameters.



Drilling and tapping cycles.



Slot milling.



Bossing.



Facing.



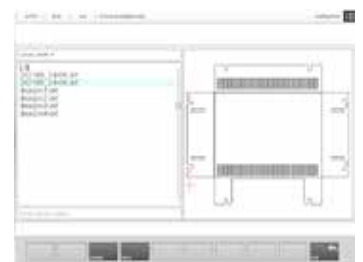
Selection of the geometrical element.



Generated profile display.



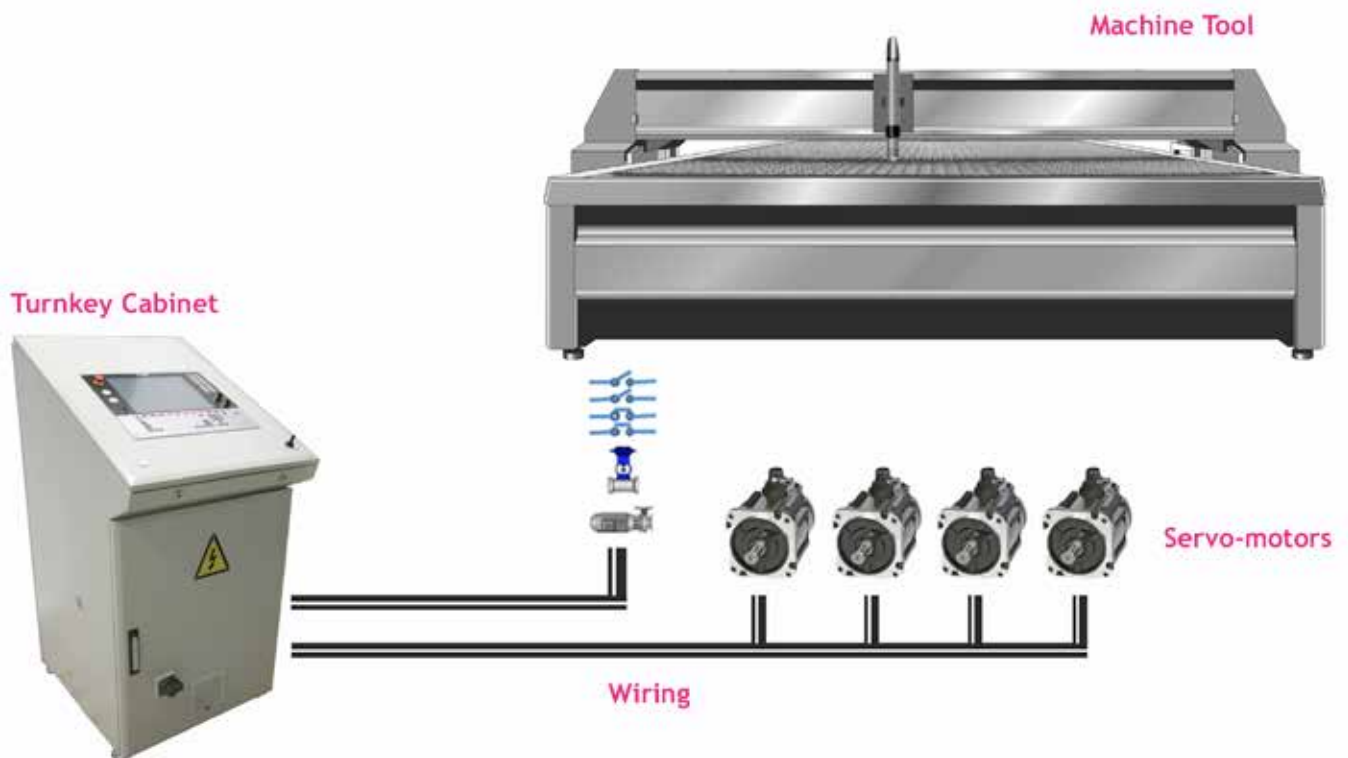
An environment dedicated to the technology allows the setting of tool parameters and machine origins.



Import functions of DXF files generated by CAD increase the operating possibilities of OPENMill.

Turnkey Configuration

OPERATOR INTERFACE	LCD 15" display, Touch Screen, industrial keyboard and touch-pad, E-Stop, buttons dedicated to machine functions (Max 2 Joystick)	Office Standard Monitor, keyboard and mouse (not supplied). Requires a mechanical kit for assembly. Possibility of adding an Office PC (Max 2 Joystick)	LCD 6,5" TOP5 portable panel, Touch Screen, E-Stop, HPG, buttons dedicated to machine functions
CNC	OPEN-XS with Atom CPU, OPEN-M with Celeron M CPU, OPEN-XL with Core 2 Duo CPU		
SOFTWARE	Single or Double Operating System with software OPEN-20 or OPEN-30		
APPLICATION	OPENCut Plasma, OPENCut Laser and OPENMill	-	
I/O MODULES	OPENrio SL modular I/Os which can be increased up to 96 I/O (digital and analog)		
DRIVES	Up to 8 servo-drives with currents of 3A, 4.5A, 6A, 12A RMS		
OPTIONS	Spindle servo drive (from 1kW to 11 kW) up to 2 Joysticks, Conditioning		
MOTORS	Brushless servo-motors with or without brake		
	OS3 line: 400V with Sincos transducers (incremental or absolute) from 0,6 to 2,8 kW		
	XML line: 400V with incremental encoder. From 0,9 up to 3kW 200V with incremental encoder. From 0,2 up to 1,4 kW		
SAFETY	Double contactor, safety relay (optional), STO on all servo-drives, emergency button		





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