

Milling machine system

The design is based on a double-processor system; one dedicated to interface management and one to axis management with built-in PLC.

Hardware

PC12 is an industrial PC manufactured on a PC base, with a Microsoft Windows© operating system.

PC12 has been designed to work in industrial environments, it has an IP64 protection rating and can be housed in any type of electrical cabinet. It has a 12" LCD active matrix (TFT) monitor with an 800x600 SVGA resolution.

It can easily be connected to the outside world thanks to an Ethernet line and 2 RS232 serial lines, like any office PC. The upper part contains the floppy disk reader (can also be replaced with a USB HUB) protected by a suitable hermetically sealed system.

Axis management is based on the UR-10 or UR-05X, both with built in PLC and operable from the CANOpen FieldBUS.

The axes can be 5 or 12 Volt with Line-Driver or Open-Collector connection.



Software

Access to the interface and to programming is based principally on the use of vertical and horizontal function keys fitted to the PC12 with corresponding illustrative icons, aiming to make the system intuitive and easy-learning.

The system allows work programming, both with ISO language and macros with modes for self-learning of quotes and tools.

It is fitted with an ISO editor, gives a graphic display of the work sequence, has a zoom function and it allows the user to follow the work process graphically, step-by-step.

ISO codes are supported for positioning, drilling, milling and miscellaneous functions (M codes), which can also be user-defined.

Self-learning macros allow the user to monitor positioning and different types of drilling operations (grill holes, in-line, on parallelogram, etc.).

Tool configuration; each tool can be associated a different corresponding image.
Capability to define 100 piece sources.

Manual function for operating the mandrel, axes and other machine cycles, with axle override and mandrel override control.

Management of axes via adjustment wheel.

The application also offers the option to personalise language messages for operation of the interface.

The screenshot displays the software interface for the Tecnos G.A. Srl system. The top window, titled 'Stato Macchina', shows the current status of the machine axes (X, Y, Z, W) and their respective positions and errors. Below this, there are indicators for the machine's operational status (IN/OUT) and a set of adjustment wheels (1-8). The bottom window, titled 'FERRARI.PRG', displays a list of program steps (N1 to N24) with their corresponding coordinates and tool numbers. The interface includes various icons for navigation and control, such as a home button, a power button, and a refresh button.

Asse	Quota Pezzo	Q. Macchina	Err.Pos.	DAC	Errori
X	-0.008	577.512	0.000	0	0.0.0000
Y	0.002	171.022	0.000	0	0.0.0000
Z	107.123	154.243	0.000	0	0.0.0000
W	12.128	12.128	0.000	0	0.0.0000

Stato Macchina

FERRARI.PRG

- N1 N10 G80 M42
- N2 N12 (G21 M31)
- N3 N16 (LAMIERA : 1000,1000, 5,FE)
- N4 N18 G100 X1000 Y1000 Z5
- N5 N20 G00 G70 X0 Y0
- N6 N22 M87
- N7 N24 (TORCIA PLASMA)
- N8 N26 M06 T05
- N9 N30 G70 X101.607
- N10 N32 G70 Y83.099
- N11 N34 M17
- N12 N36 G02 X103.36 Y86.419 I6.794 J-1.463 F1700
- N13 N38 G03 X104.398 Y89.216 I-7.582 J4.409
- N14 N40 G03 X104.52 Y91.331 I-4.316 J1.307
- N15 N42 G02 X104.399 Y91.866 I16.384 J3.933
- N16 N44 G03 X100.781 Y97.606 I-8.568 J-1.391
- N17 N46 G02 X84.448 Y119.05 I13.997 J27.603
- N18 N48 M18
- N19 N56 G70 X133.391 Y55.832
- N20 N58 M17
- N21 N60 G02 X133.387 Y52.85 I-8.288 J-1.482 F1700
- N22 N62 G02 X132.71 Y52.05 I-0.668 J-0.121
- N23 N64 G01 X124.431
- N24 N66 G02 X122.257 Y53.282 I0.004 J2.54