

F-Class

» One platform, any machine
Your ideas, our motion »



FIDIA 

F-Class Platform

ONE PLATFORM ANY MACHINE.

The **F-Class** is Fidia's new generation of numerical controls, designed to adapt to every need. Whether you're building a milling machine, a grinding system, or something entirely custom, from laser cutting to metrology and beyond, the F-Class is the ideal solution. Two products, one shared foundation: the compact **F19** and the modular **F100**. Different in architecture, identical in quality, the same Fidia technology at their core, the FMU.



BLOCK CYCLE TIME

up to 250 μ s

Faster processing for complex machining operations.

Flexible & Modular

Adapts to any machine architecture. The F-Class adapts to your machine, not the other way around.

Any Type of Machinery

Not only milling. Designed for grinding, laser, waterjet, metrology, and custom applications.

Easy to Customize

Your machine logic, your way. The IEC61131-3 PLC with full support for existing AUCOL systems gives you full control over your machine's behavior.

Complete Packages

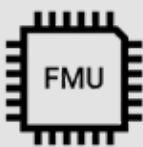
One order, one partner. Fidia delivers everything, CNC, drives, motors, and I/O.

Intelligence at the Core

FMU - V6 - PLC.

FMU: The Brain Behind Every Move

Every **F-Class** control is powered by the FMU, Fidia's dedicated motion unit. It runs the control algorithms in complete isolation from the screen and the operator, so nothing ever interferes with what the machine is actually doing. This separation also contributes to system robustness and cybersecurity, protecting the core control functions from external interactions. The result: smooth, predictable motion every single time.



FMU - Dual-Core-Real-Time Processor



User Interface



Drives - I/O- Sensors
Safety functions

V6: Fidia's Motion Intelligence

V6 is the motion software that Fidia has built and refined over decades of real machining experience. It reads the toolpath ahead, anticipates every curve and corner, and keeps the machine moving at the right speed at the right moment, automatically. The surface finish speaks for itself.

- Reads ahead and reacts before the machine needs to slow down
- Manages acceleration and smoothness on complex 3D surfaces
- The same V6 on every F-Class, **F19** or **F100**, same result
- Proven on thousands of molds, dies, and precision parts worldwide.

PLC: Your Machine, Your Logic

The F-Class includes a powerful integrated PLC that machine builders can program freely. Write it from scratch, or bring your existing logic, it works either way. Full compatibility with previous Fidia machine programs means you don't have to start over.

- IEC 61131-3 standard programming languages: easy to learn, easy to maintain
- Your existing Fidia machine programs run without changes
- Debug tools included: faster commissioning, fewer surprises
- PLC interpolability within external networks.

250 µs

REACTION SPEED

+200 %

IMPROVED BLOCK PROCESSING
PERFORMANCE

32

MAX CONTROLLED AXES

Compact

F19

COMPACT PERFORMANCE FOR EVERY APPLICATION



Designed for Any Machine

The F19 is not limited to milling. Its architecture makes it the right choice across a wide range of applications.

MILLING

GRINDING

LASER CUTTING

WATERJET

METROLOGY

RETROFIT

CUSTOM MACHINES

ALL-IN-ONE.

No Compromises.

The F19 integrates the operator interface, push-button panel, keyboard, and FMU core into a single compact console, designed for machine tools where installation space matters. Despite its size, it delivers full F-Class performance: the same V6 algorithms, EtherCAT backbone, and IEC 61131 PLC as the F100.

Features

- All-in-one architecture: console, FMU, and HMI in a single integrated unit;
- 18.5" full HD touchscreen — clear, responsive, built for the shop floor;
- Configurable push-button panel: with integrated keyboard and pointing device;
- Works with virtually any machine layout or mounting configuration;
- Expandable with drives, I/O modules, and accessories via EtherCAT.

Modular

F100

THE FUTURE OF PRECISION AND PERFORMANCE

Designed for Any Machine

The F100 is built on a modular architecture designed for flexible and customizable machine configurations

5-AXIS MILLING

GRINDING

LASER 2D/3D

METROLOGY

GANTRY

MULTI-SPINDLE

WATERJET



Modular Architecture. Built for what's demanding.

The F100 separates the FMU core from the operator console, ensuring maximum isolation and control of functions at full capacity. Designed for complex and demanding applications, from 5-axis high-speed milling to multi-spindle and gantry configurations.

Features

- Distributed architecture FMU and console connected via Ethernet for maximum flexibility;
- 21.5" full HD touchscreen with optional second monitor;
- Modular push-button panel with customizable button layout;
- EtherCAT with bridge modules for third-party protocol integration;
- Designed for integration with external systems and industrial networks.

Complete Solution

5 AXIS

EXCELLENCE



TCS – Tool Coordinate System **Natural control relative to the tool**

The TCS system aligns the Cartesian coordinate system with the tool axis, simplifying programming and motion control even in 5-axis machining.

This approach allows the operator to work directly “relative to the tool”, making complex operations such as inclined drilling and machining on oriented surfaces more intuitive.

RTCP

Absolute tool tip accuracy in any configuration

RTCP (Rotation Tool Center Point) is a key function for 5-axis machining, allowing the CNC to maintain the exact position of the tool tip during rotary axis movements.

The control automatically compensates each rotation through coordinated linear axis movements, eliminating typical errors of traditional systems and allowing direct programming of the toolpath without considering the machine pivot.

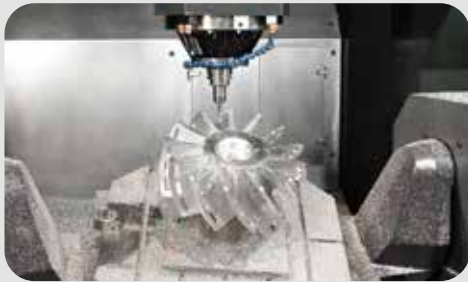
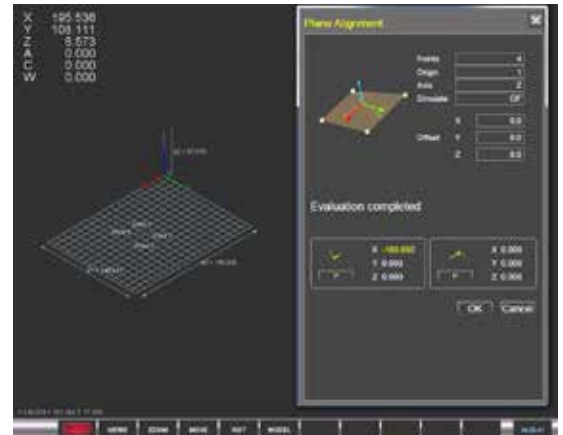
Machine geometry and tool length are managed automatically, ensuring high accuracy and flexibility. Whether using bi-rotary heads or rotary-tilting tables, Fidia controls guarantee smooth motion and consistent machining quality even in the most complex applications.



Workpiece Alignment

Zero manual setup

3D alignment cycles automatically define the workpiece coordinate system using measurements taken directly on the machine via digital probes or manual tool acquisition. From these points, the CNC calculates the necessary roto-translation parameters to align the local coordinate system with the part's actual geometry. Once activated, this eliminates the need for precise physical workpiece alignment during setup. Dedicated graphical interfaces simplify the process, guiding operators through selecting geometric elements like planes, holes, or pins.



ROTO

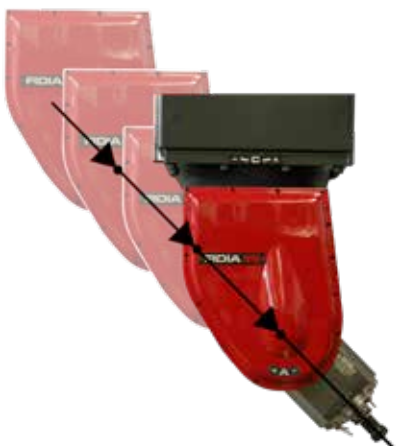
On Roto-Tilting table 5-axis machining, the CNC can maintain the exact position of the tool tip on table during rotary axis movements.

The control automatically compensates each rotation through coordinated linear axis movements allowing direct programming of the toolpath on the table.

CQAHDW

During milling execution it's possible to move by handwheel each axis to correct the tool tip position.

It's possible to select "T" function to move by handwheel the tool axis (so X,Y,Z together if the tool is inclined) to move away from or closer to the workpiece.



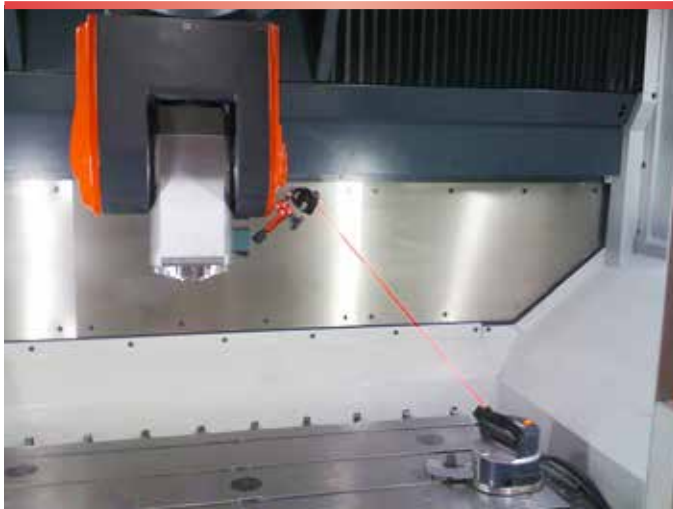
Virtual Axis

Simplified movement along the tool direction

The virtual axis is a CNC-generated, non-physical axis that automatically aligns with the tool's direction. It simplifies programming by converting complex 3D movements into a single direction. Operable in both manual and program modes, it interpolates like a real axis. It is ideal for inclined drilling, entry, and retract phases, enhancing control and reducing collision risks.

Complete Solution

PRECISION & ACCURACY



In-process Measurement Integration with measurement systems

Fidia controls support integration with in-process measurement systems, enabling bidirectional data exchange between the CNC and external platforms dedicated to dimensional control.

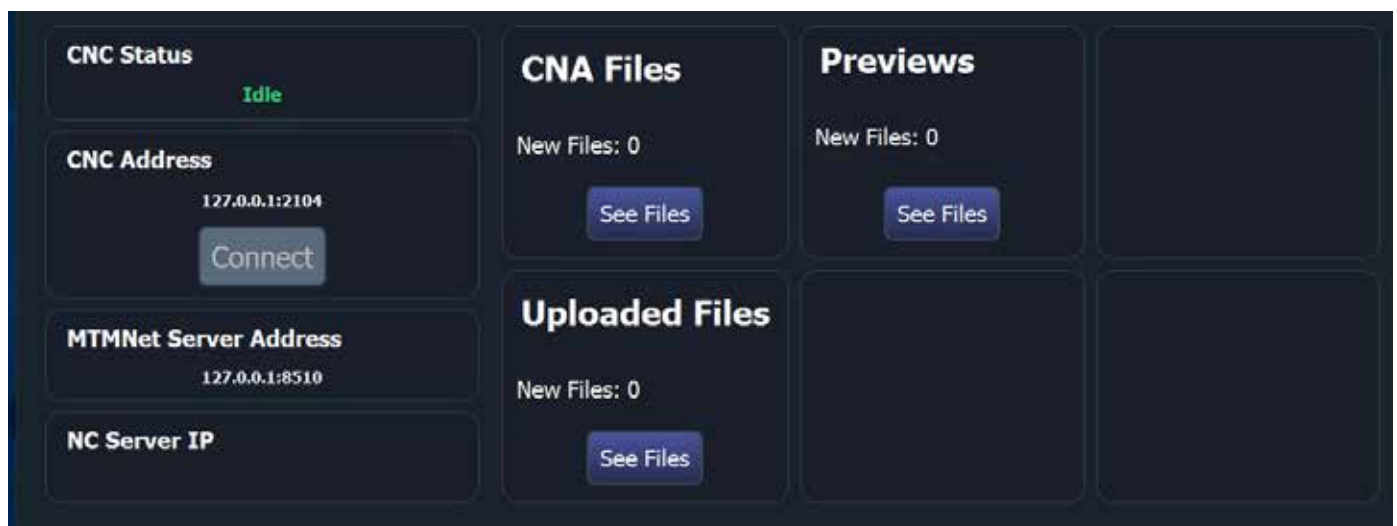
Through dedicated software interfaces, it is possible to execute measurement cycles directly on the machine and automatically manage the results, enabling adaptive machining strategies based on acquired data.

The system allows execution of customized measurement procedures, acquisition and transmission of dimensional data, and interaction with external applications for process analysis and management. In this way, the CNC becomes an active part of the quality workflow, helping to reduce scrap, improve repeatability and increase the level of process automation.

Accuracy across the entire working volume

The VAC (Volumetric Axes Compensation) function enables three-dimensional compensation of geometric errors across the entire machine working volume. The system processes a complete map of deviations, measured using high-precision instruments, and transforms them into corrections applied in real time during machining.

This compensation considers not only linear axis errors, but also deviations related to tool orientation and head positioning in space, ensuring high and uniform accuracy in every position. The result is a significant improvement in overall machine accuracy, particularly relevant in multi-axis and highly complex machining operations.



CONTROL THE MACHINE PROTECT EVERYTHING ELSE



ViMill - Collision Control

ViMill is Fidia's integrated anti-collision system that operates directly on the CNC, verifying real machine positions in real time and ensuring continuous control throughout the machining process. Unlike traditional simulation-based systems, ViMill works on actual axis positions, ensuring reliable and immediate protection of all involved components.

The system is active not only during program execution, but also during manual movements: during JOG or handwheel operations, ViMill prevents any risk of collision between tool, head, workpiece and fixtures, making manual movements completely safe.

The result is increased operational safety, reduced risk of machine damage and improved overall process reliability.



Productivity & Process Efficiency

MORE OUTPUT SAME MACHINE

ACL

Adaptive Control Logic



Real-time adaptive performance

ACL automatically adjusts machining parameters based on actual cutting conditions, improving performance especially during roughing operations.

It includes advanced vibration reduction (CRS) and custom parameter management (CPM), enabling productivity increases of over 30% and extended tool life.

CRS (Chattering Reduction System) identifies vibration frequencies in the cutting process and adjusts spindle speed dynamically to move out of resonance, reducing surface defects and spindle stress.

CPM (Custom Parameters Management) modulates feedrate in real time based on load feedback, maximizing material removal rate while keeping cutting forces within defined limits. The result is shorter cycle times with no compromise on surface finish or tool life.

+30%

**PRODUCTIVITY INCREASE
ON HEAVY CUTS**

REAL

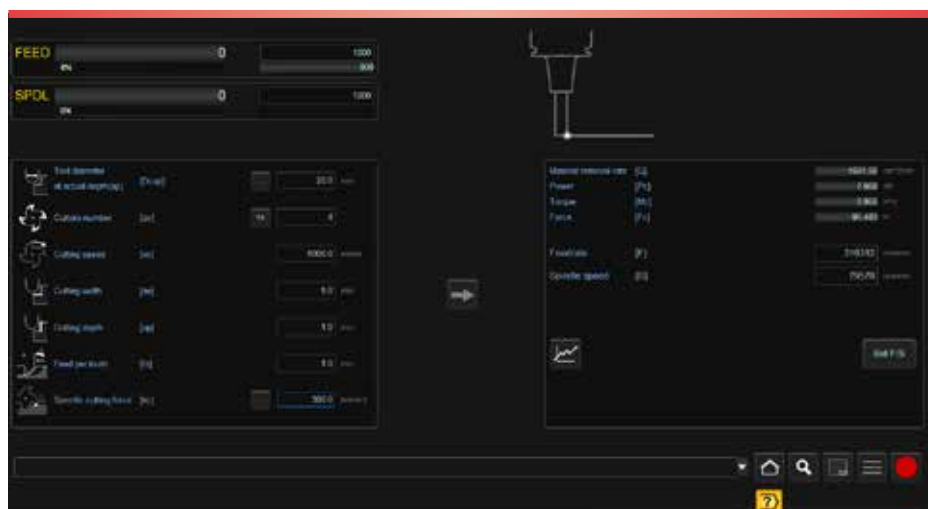
**TIME FORCE
MONITORING**

AUTO

**FEEDRATE AND SPEED
ADAPTATION**

0

**PART-PROGRAM
CHANGES REQUIRED**



Tool Life Management

The Tool Life Management module tracks tool usage by time, number of operations, or distance traveled and automatically substitutes a spare from the same family when the defined limit is reached. Production continues without operator intervention.

The module also integrates the **Tool Data Calculator**,

which computes and verifies cutting parameters based on material, tool geometry, and machine capability, optimizing each tool's performance across its usable life.

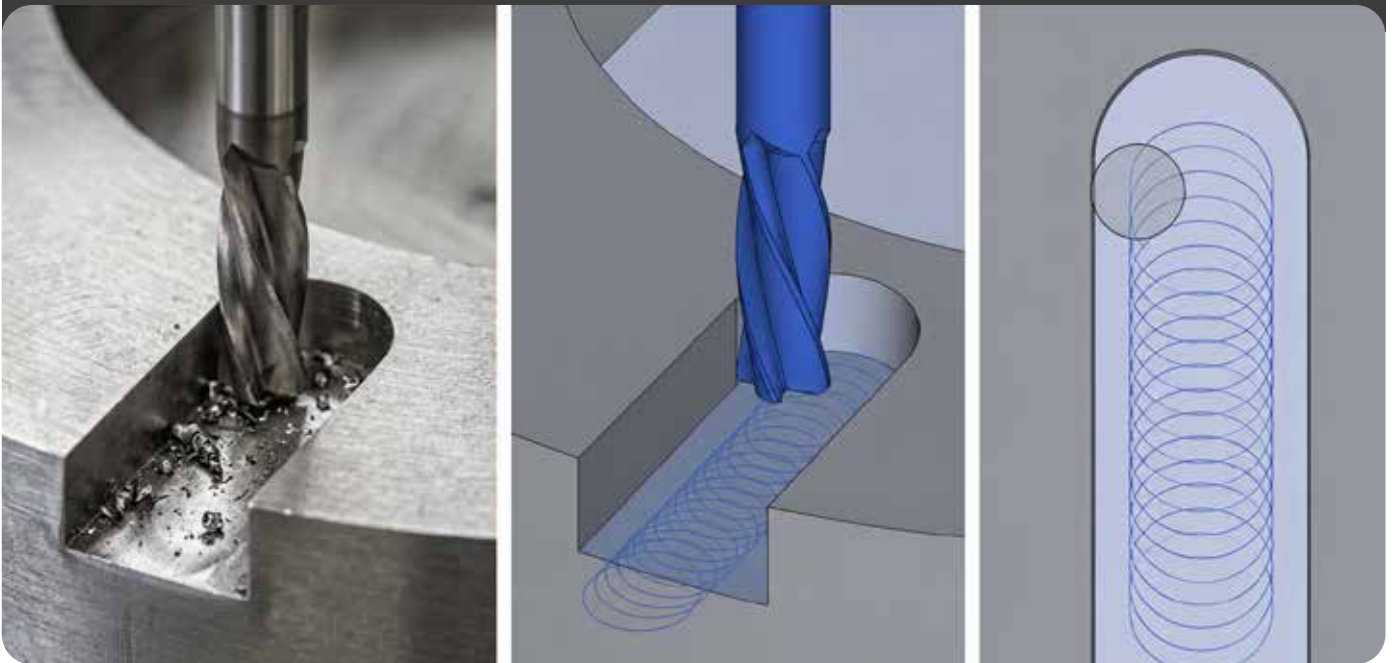
Productivity & Process Efficiency

MILLING IS WHERE IT STARTS

Trochoidal Milling

Trochoidal milling combines circular motion with linear feed to optimize material removal, making it particularly effective for roughing operations on difficult materials.

This strategy allows deeper cuts while reducing vibrations and heat generation, and increasing feed rates, resulting in a more stable and efficient process.



High-Speed Drilling

Advanced motion control strategies enable high-speed drilling cycles with high accuracy and stability, even on difficult materials.



Dyna

A Look Ahead parameter that lets the operator tune the dynamic behaviour of the machine: higher values for maximum throughput, lower values for finest surface finish.



CNC FUNCTIONS

YOUR JOB

STOP AND RESTART WHEN YOU WANT



User Functions (Handwheel, Rewind, Retract)

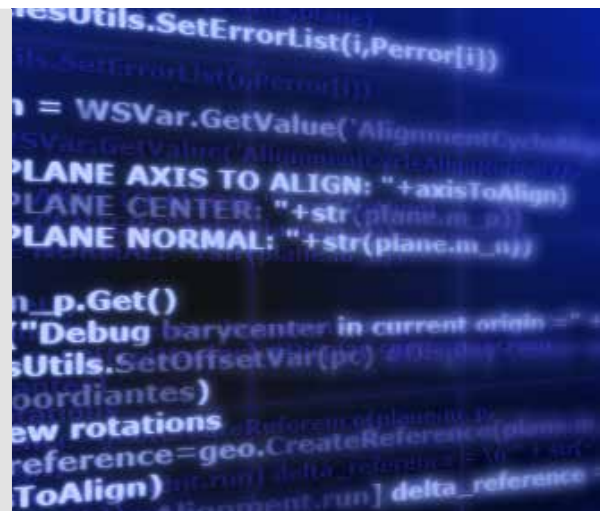
Fidia User Functions allow the operator to safely manage unexpected interruptions and manual interventions during machining.

- **Rewind**
Returns the machine to the stop point by automatically retracing the executed path, ensuring safe recovery and proper restart conditions.
- **Retract**
Safely moves the tool away from the workpiece. In 5-axis machining, when combined with the virtual axis, the movement follows the actual tool direction, reducing collision risk.
- **Handwheel**
Enables precise manual intervention through the electronic handwheel, allowing controlled movements along the selected axes.

These functions reduce downtime, increase operational safety, and improve the management of complex machining processes.

PRX – Advanced Programming

PRX is Fidra's advanced programming language that integrates Python capabilities with CNC commands, enabling the creation of complex and highly automated machining cycles. Thanks to this integration, the user can directly access CNC parameters, use Python libraries and manage files and advanced logic, significantly expanding programming and process customization possibilities.



CNC FUNCTIONS

INDUSTRY 4.0

Machine Monitor - OPC UA

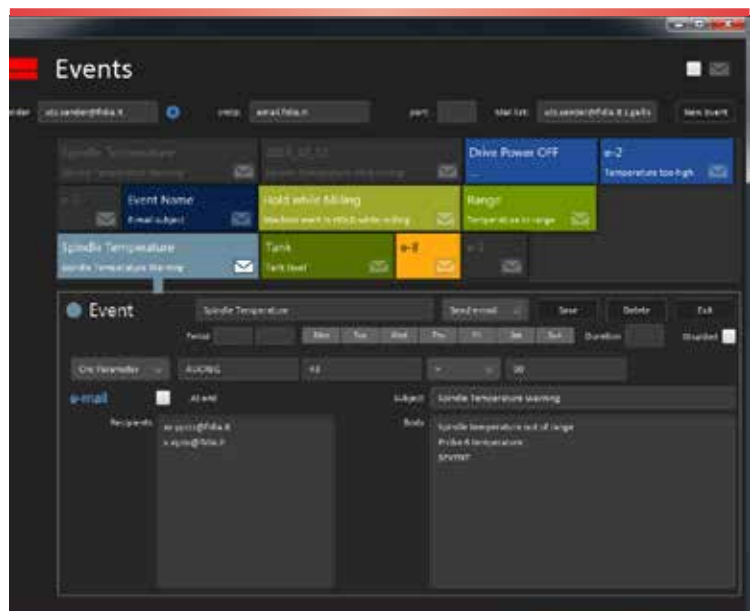
Machine Monitor enables continuous monitoring of CNC and machine activities, integrating with standard industrial communication protocols such as OPC UA. It allows real-time data acquisition and integration with supervision and analysis systems, supporting monitoring of production performance. This provides greater visibility over the process, facilitating production control and optimization of operational efficiency.



Event Manager & Log Analyzer

The Event Manager & Log Analyzer system provides advanced tools for monitoring and analyzing machine behavior, enabling more effective management of operations and maintenance. Event Manager allows configuring automatic notifications, including email alerts, based on events defined by the operator, ensuring constant and timely monitoring of machine conditions.

Log Analyzer, on the other hand, enables detailed analysis of CNC log files through search, filtering and graphical representation functions. This allows quick identification of anomalies, reconstruction of events and support for diagnostics and process optimization activities.



Multi-Technology Applications

ONE PLATFORM

EVERY PROCESS

The F-Class platform is not tied to milling. The same CNC architecture that manages 5-axis high-speed cutting also controls turning operations, 2D laser cutting, grinding, and metrology cycles. The machine changes. The controller does not. This is what it means to build on a platform.



Turning Functions

The F-Class platform supports multi-technology applications, including turning functionalities, extending the machine's operational flexibility.

Laser Cutting 2D

The platform flexibility allows use in 2D laser cutting applications, ensuring precise trajectory and process parameter control.

Technical Specifications

F19 - F100

	F19	F100
Architecture	All-in-one 24V DC	Distributed 24V DC
Max controlled axes	32	32
Console processor	Intel 2 GHz (2,6GHz Burst) Quad Core	Intel 1,8GHz (4,60GHz Burst) 12 Core processor
RAM	8 GB	16 GB
Storage	128 GB SSD M.2	240 GB SSD M.2
Operating system	Windows 11 IoT	Windows 11 IoT
Display	18.5" Full HD P CAP multi-touch	21.5" Full HD P-CAP multi-touch
Second monitor	—	✓ (configurable position)
Block Cycle Time (BCT)	up to 250 us	up to 250 us
Field communication	EtherCat	EtherCat
PLC environment	IEC 61131-3 / AUCOL legacy	IEC 61131-3 / AUCOL legacy
PLC cycle time	20-100 ms	20-100 ms
Operator interfaces	WS5 WS32 Legacy	WS5 WS32 Legacy
Headless configuration	✓	✓
Power supply	24V DC	24 V DC
Dimensions (HxWxD)	518x461x287	685x615x505
Weight	17 kg	30 kg

Productivity & Process Efficiency

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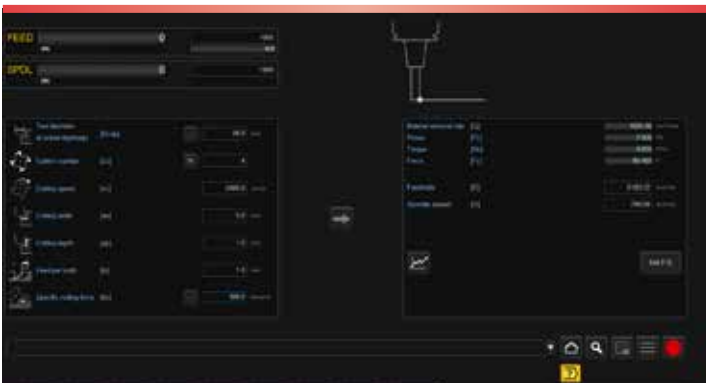
**TIME FORCE
MONITORING**

AUTO

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0

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CHANGES REQUIRED**



Tool Life Management

Automatically monitors tool wear and swaps backup tools within the same family to ensure continuous production. The module also integrates the **Tool Data Calculator**, that optimizes cutting parameters to extend tool life and maximize performance.



High-Speed Drilling

Advanced motion control strategies enable high-speed drilling cycles with high accuracy and stability, even on difficult materials.



Trochoidal Milling

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ISO 9001
Quality

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