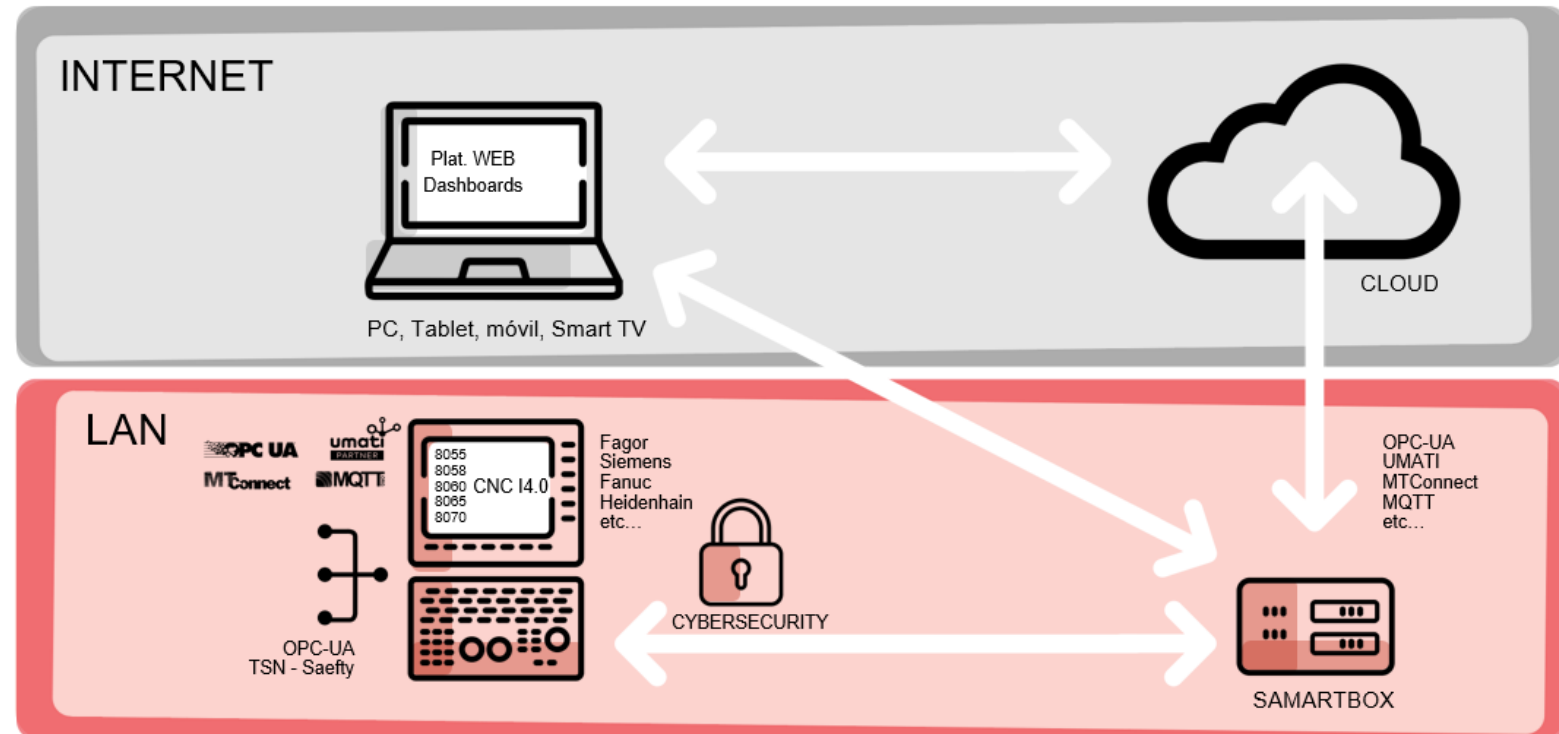# Fagor Digital Suite

FAGOR DIGITAL SUITE:

Complete digitalization of the machines:

FAGOR DIGITAL SUITE is Fagor's digitalization solution that makes it possible to connect the machines with the rest of the production and management systems, capturing all the necessary data and transforming it into valuable information to facilitate decision-making.

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Main features:

– **Solution: USER** and **OEM** targeted solution
– **Solution:** Standard or customized to customer needs.
– **Multibrand:** Compatible with CNCs in the market. (Fagor, Heidenhan, Siemens....any CNC with standard protocols (DMG Mori, B&R, Okuma...)
– **Multiprotocol:** OPCUA, UMATI, MTConnet, MQTT, SQL, etc.
– **Interoperability:** Can be connected with the rest of the plant's production systems.
– **Standard** or **customized** HMIs.
– **Fast implementation**, **scalable** in equipment – features, **low-intrusive** installation.
– **Cybersecurity:** ISO/IEC 15408:2009, ISO/IEC 18045:2008 and Common Criteria.

FAGOR DIGITAL SUITE:
Protocols already included in the smartbox:

CNC and other infrastructures
OPC UA
OPC DA
OPC DA 1.0
MQTT
MTConnect
Fagor 8035/8037/8055/8058/8060/8065/8070
Heidenhain (iTNC530, TNC 640)
Siemens (Sinumerik Operate 840D 4.93)
Siemens (Sinumerik One 6.13)
Siemens (Sinumerik HMI)
Fanuc (Focas)
Fidia
Okuma
Beckhoff ADS TwinCAT
Laser IPG
Any CNC with standard protocols (DMG Mori, B&R, Okuma…)

PLCs
PLC S7 Protocol (Siemens)
EthernetIP - CIP
Omron FINS UDP
Omron FINS TCP
Omron Hostlink
ModbusTCP
ModbusRTU
B&R INA2000
Others
SQL (sqljdbc and ojdbc)
COM Serie
FTP
SFTP
XML
CSV
API REST
SECS/GEM (checking for semiconductors sector)

FAGOR DIGITAL SUITE:

Connectivity for FAGOR CNC Catalogue:

Fagor:
CNC 8035 / 8037 / 8050 / 8055 (needs Ethernet) Connectivity integrated in smartbox
CNC 8060 / 8065 / 8070 - XP   Connectivity integrated in smartbox
CNC 8058 / 8060 / 8065 / 8070 - W7 / W10   Connectivity Pack

FAGOR DIGITAL SUITE:

Why we are using a Smartbox:

- Not all the Systems have native connectivity capabilities, we need a "external connector"

- Allows the connection of several machines in the same unit. (up to 10 machines)

- Provides the necessary cyber-security requirements by isolating the machine

- It is the basis on which software updates would be performed, always updated, no CNC or system update needed

- It can connect to other equipment or system, internally, with the cloud, ...

- It allows a non-intrusive installation or deployment (warranties, competitors CNC, etc)

- It can be connected to any brand CNC, sensors or systems with standard protocols (robot, warehouse, PLC, probe, ...)

- We have process capabilities on the Edge no overloading the CNC

- Buffer if the connection is lost

Fagor Smart Box

- Model J4N-8M-240SSD

- Model WiFi J4N-8M-240SSD-W

- Other models available > i9

ISO/IEC 15408:2009
ISO/IEC 18045:2008
COMMON CRITERIA 3.1 r5

FAGOR DIGITAL SUITE:

Motherboard Specification

CPU	Fanless INTEL® Bay Trail-M Celeron N2930 SoC Processor 1.83GHz, Quad-Core, 7.5W
Memory	1 x 204-pin DDR3L-1333 SO-DIMM Single Channel up to 8 GB (1.35V required)
VGA	Intel® HD Graphics
LAN	2 x Intel® I211-AT Gigabit Ethernet (from 5/2020 and up) * 2 x Intel® 82583V Gigabit Ethernet (up to 4/2020)
Audio	Realtek ALC887 Audio CODEC with SPDIF out
Storage	1 x full size mSATA Slot
Wireless / Mini-PCIE Slot	1 x half size Mini-PCI Express Slot	Mini PCIE WiFi + Bluetooth
Board Form Factor	NUC Form Factor (101mm X 101mm)

Chassis Specification

Product size	116 * 110 * 49 mm
Material	Lightweight aluminum alloy with extruded aluminum IO panel
Storage Bay	NA
Front I/O Port	1 * Power Button 1 * Power LED 1 * RS232/422/485 COM port 1 * USB 3.0 1 * USB 2.0
Rear I/O Port	2 * USB 2.0 ports 2 * HDMI 2 * RJ-45 port 1 * Audio line out with SPDIF out 1 * 9V ~ 24V DC-in jack 2 * SMA Connector for WiFi Antenna
Power	Adapter : AC_90~240V / DC_12V_3A/36W
Environment	Operating Temperature : 0°C ~ 40°C with air flow Storage Temperature : -20°C ~ 80°C
Functional	Digital Signage, Set Top Box, Thin Client, Car Entertainment, Smart Mini PC, POS/POI, KIOSK, HTPC
Certificate	CE,FCC,ErP For Barebone CE,FCC,TUV,UL,CCC,CB,ErP For Power Adapter

FAGOR DIGITAL SUITE:

How we work on an implementation:

- We have initial meeting to identify the customer needs (application, etc.)
- We collect all the information of the machine to be connected:
  - Manufacturer / Machine Model
  - CNC Manufacturer / Model
  - OPCUA or other protocols available
  - Network connection: Wired, Wifi, Static IP
  - Identify variables and information required by customer
  - Users to be created (name / email)
- We send the smartbox 80-90% configured
- After connection, we can do most of the work remotely
- We don´t need a very specialized training

FAGOR DIGITAL SUITE

Manufacturing Intelligence

FAGOR AUTOMATION · Open to your world

SOLUTIONS

Solutions

USER solution

Aimed at users who are looking for indicators to improve the availability and efficiency of their machines, integrating information from the machine, technical office, staff, scheduling, production, etc.

• MONITORING: The modules that make up the standard user offer provide valuable information in real-time and can be organized by periods, different profiles, and side-by-side comparisons for key metrics such as availability, efficiency, quality, OEE, electrical, and energy consumption.

• PLANNING: The project planning module allows you to plan and distribute the work on the available machines, taking into account the operations that can be carried out, their availability, workload, etc.

Solutions

FAGOR Open to your world
FAGOR AUTOMATION

USER

Modules with Accurate information based on massive analysis and processing of machine and process line data.

- **Very fast implementation in 2 weeks*.**
- **Self-deployable plug&play system that collects and processes CNC, PLC and machine component data.**
- **Manages multiple offshore plants in a unified way.**
- **Interoperable with other machines and IT/OT systems.**
- **Cybersecurity**: ISO/IEC 15408:2009, ISO/IEC 18045:2008 y Common Criteria

USER LEVEL: User management modules

PRODUCTION AVAILABILITY EFFICIENCY QUALITY

PLANNING MAINTENANCE ENERGY

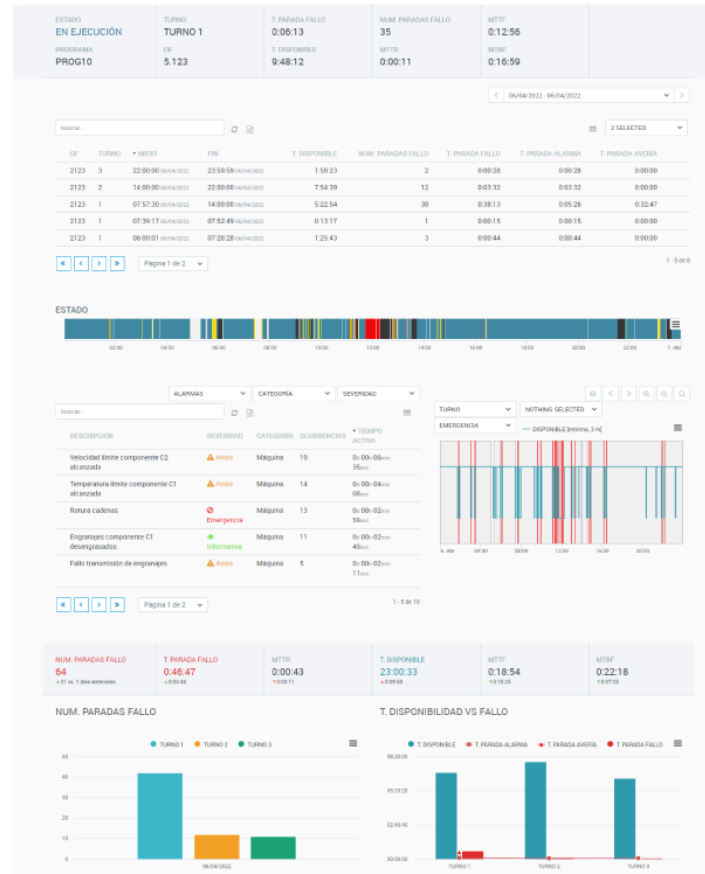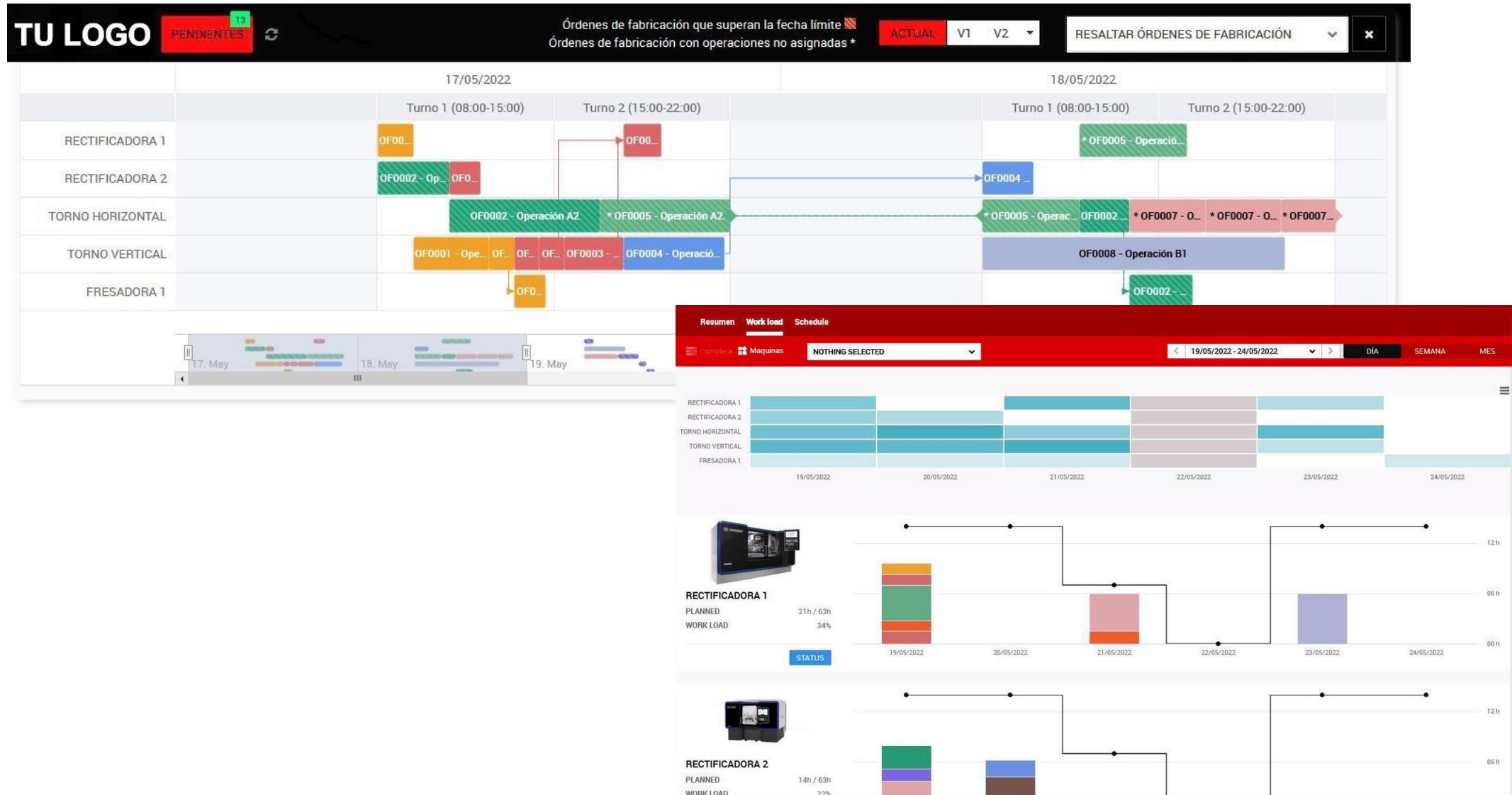| 1. MANAGEMENT	2. FACTORY	3. ENGINEERING
Overview Email Reports	Dashboards Avanzados	Insights & Deep-dive Analytics tools
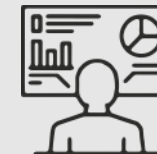
Solutions

MONITORING
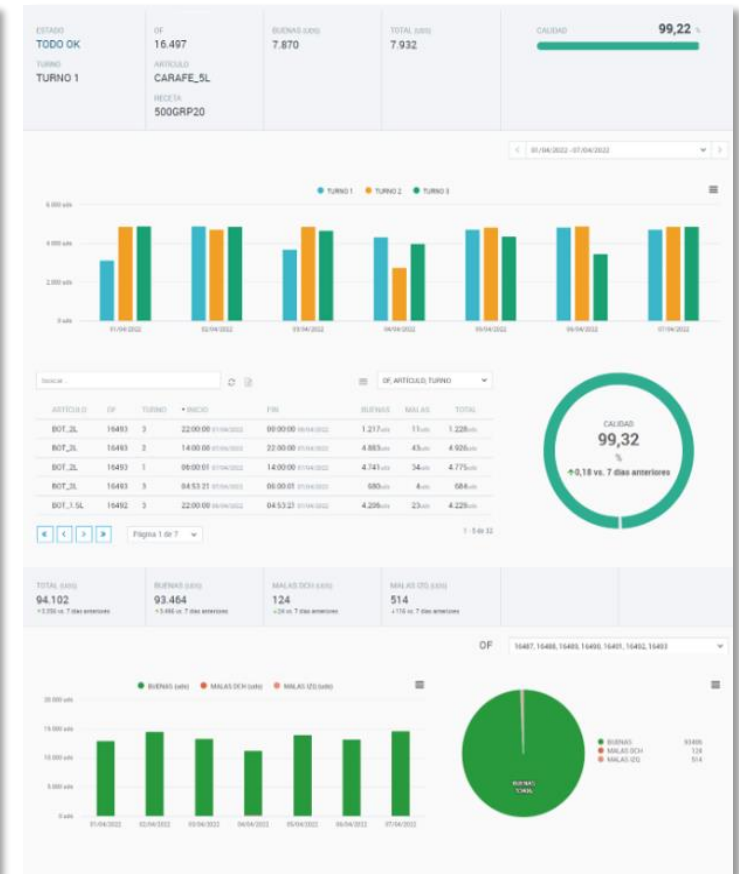
Solutions

PLANNING

Solutions

FAGOR OEM provides a suite of tools to the machine builder that enable the creation and monetization of new digital products and services.

OEM

CLOUD

Aimed at manufacturers who want to enhance asset management and release proprietary services.

Total management of offshore industrial assets

Fagor Asset Management Platform

MANUFACTURER - OEM solution

Aimed at manufacturers who want to enhance asset management and release proprietary services. The Fagor Digital Suite provides the machine manufacturer with an intuitive toolkit that enables the creation of new digital products and services:

• All user-oriented services.

• Customized virtual cloud with management of assets, access, users, etc.

• Teleservice and maintenance: Allows remote access and diagnostics, warning, and alarm management, etc.

• The platform enables the remote update of firmware, PLCs, etc.

• Development and administration of applications for the machine tool inventory. Applications can be managed on a global or local level, and can be oriented with new services, maintenance, etc.

Solutions

OEM

FAGOR OEM : TELESERVIVE level is for those OEM that want administrate and generate new services to their customer.
OEM has its BRAND in the platform

FAGOR OEM : ADMIN level is for those OEM that want administrate their machines: machines, smartboxes, users&roles, dashboards, warnings, reporting, etc.
OEM has its BRAND in the platform

FAGOR OEM : USER level is for those OEM that want their machines digitalized / monitored. The OEM and END USER can access to the machine information
FAGOR is the BRAND in the platform

TELESERVICE LEVEL: Machine management for manufacturers

| TELESERVICE | MAINTENANCE | EDGE | REMOTE FIRMWARE UPDATE | API | DEVELOPER TOOLS |
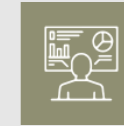
ADMINISTRATION LEVEL: Platform administrative management

| USER & ROLE | HW & MACHINE | APP |

USER LEVEL: User management modules

| PRODUCTION | AVAILABILITY | EFFICIENCY | QUALITY |

| PLANNING | MAINTENANCE | ENERGY |

OEM TOOLS:

- Own branded platform / virtual cloud / Multi-language

- User management with different profiles and access

- Management of customers, production lines, plants, etc.

- Management of smartbox, machines (registrations, deregistrations...)

- Statistics with general and individual information

- Interoperability with different data sources and protocols

- Automated reporting of statistics and data by profiles

- Definition of machine and screen templates

- Design of new screens from the beginning

- Definition and management of warnings

- Definition and management of alarms

- Maintenance management: parts and spare parts, maintenance and service

- Remote diagnostics and teleservice

- Remote update of firmware, PLCs, etc.

- Application development (API available)

# **Examples**

Availability

Am I getting the most out of my machines?

Get actionable information about…

⦿ The state of your machine and the percentage of time it has spent working, so you can compare the progression.

⦿ Availability by shift, production order, program, etc. can be compared with each other.

⦿ The main reason for downtime of your machinery in detail, the times between failures and the comparison between periods.

That will enable you to…

⦿ Reduce downtime and unplanned stops.

⦿ Increase the productive capacity of the shopfloor.

⦿ Achieve optimal manufacturing targets, at a lower cost.

⦿ Valuable information for maintenance planning.
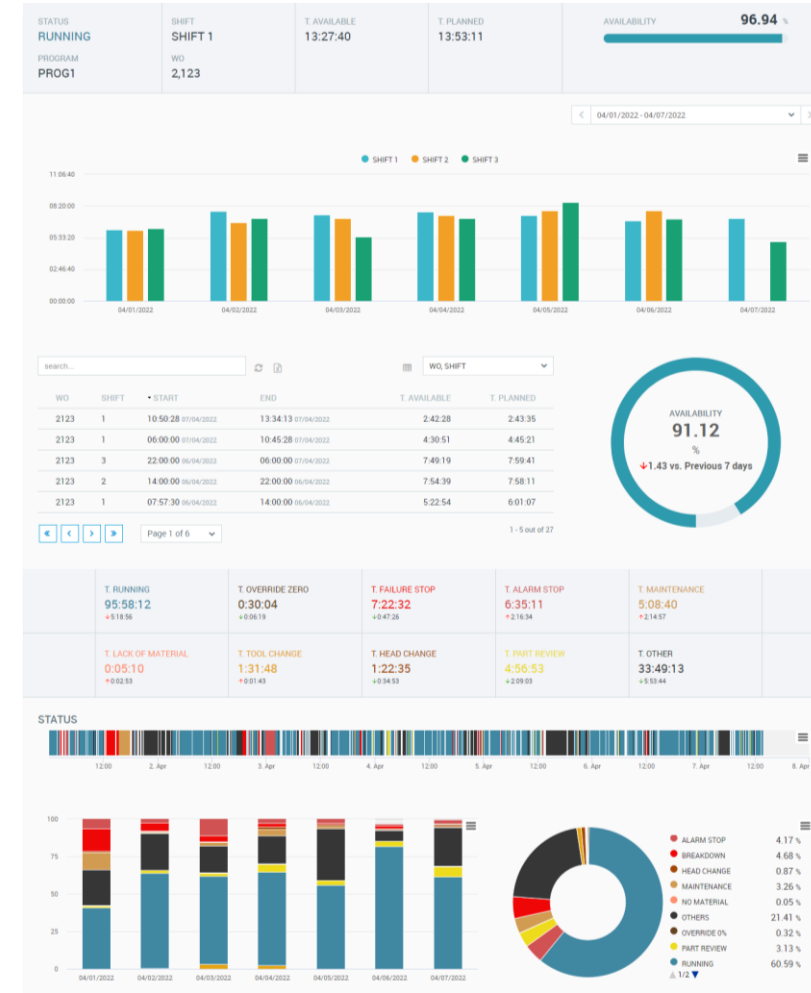
Efficiency

Am I able to produce what is programmed in the time available?

Get actionable information about…

⊙ Efficiency history, with a daily breakdown of production speed and theoretical speed.

⊙ Efficiency progress compared to previous periods.

⊙ Production speed per machine state.

⊙ Comparison of efficiency by shifts, between WOs, etc., thus identifying the reasons for higher or lower efficiency at certain times.

That will enable you to…

⊙ Optimise production speeds and prevent minor disruptions.

⊙ Leverage the entire production capacity of the plant

⊙ Optimise the use of resources by increasing profits

Examples
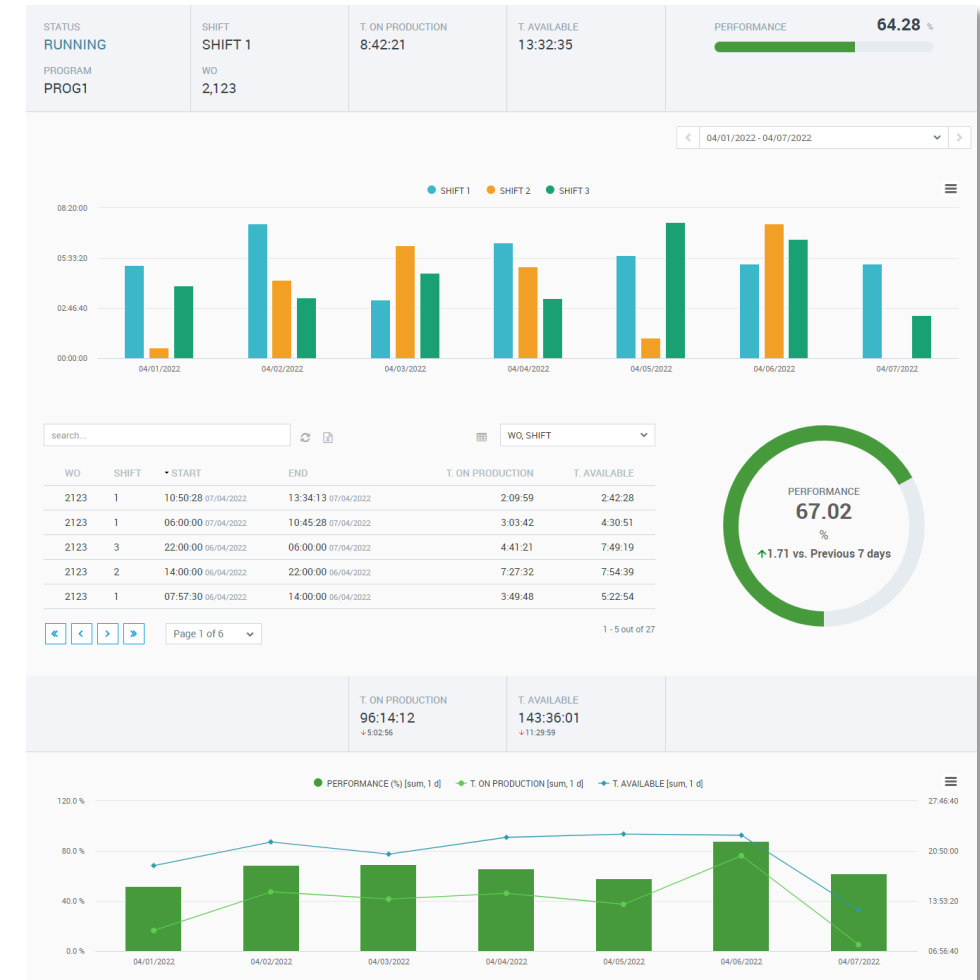
Quality

Do I have a good ratio of good parts produced to total?

Get actionable information about…

- Quality history, with a daily breakdown of rejections, drilling down into each specific rejection type.

- Quality progress compared to previous periods.

- Quality comparison between shifts, WOs, WOs of the same product, etc. To discover the reasons for lower quality in some of them.

That will enable you to…

- Reduce the output of defective components.

- Reduce waste of raw materials, semi-finished products and finished products.

- Achieve higher customer satisfaction by reducing the number of complaints and claims.

Examples
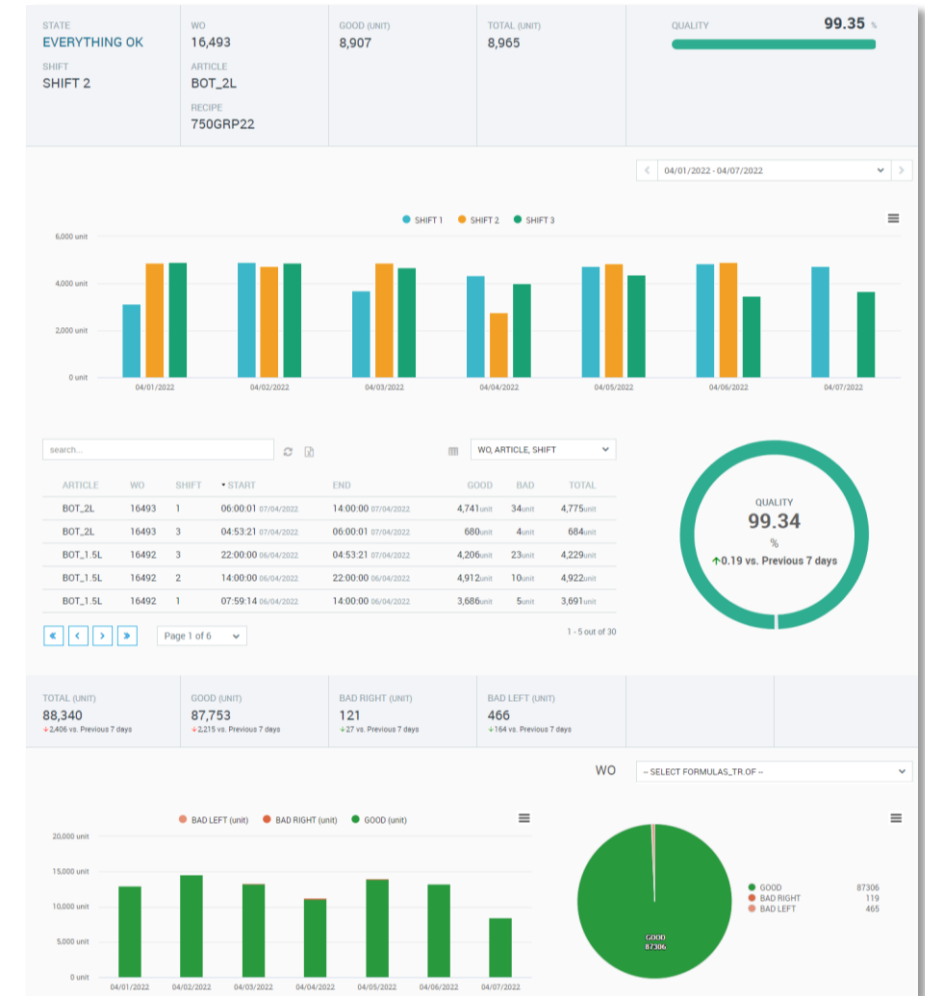
Energy and consumption

Do I know the consumption of my machines and how to optimise it?

Get actionable information about...

◉ Days/hours when the machine consumes the most.

◉ Ratio of consumption to machine production speed/number of components produced.

◉ Comparison of machine consumption by shifts, WOs, programs, etc..

◉ Electrical data of the machine in order to detect faults.

◉ Electrical data breakdown by shift/WO.

That will enable you to...

◉ Energy bill savings.

◉ Comply with (legal and social) sustainability standards.

◉ Reduce electrical failures of machinery.

◉ Save on operational and maintenance costs.

Examples
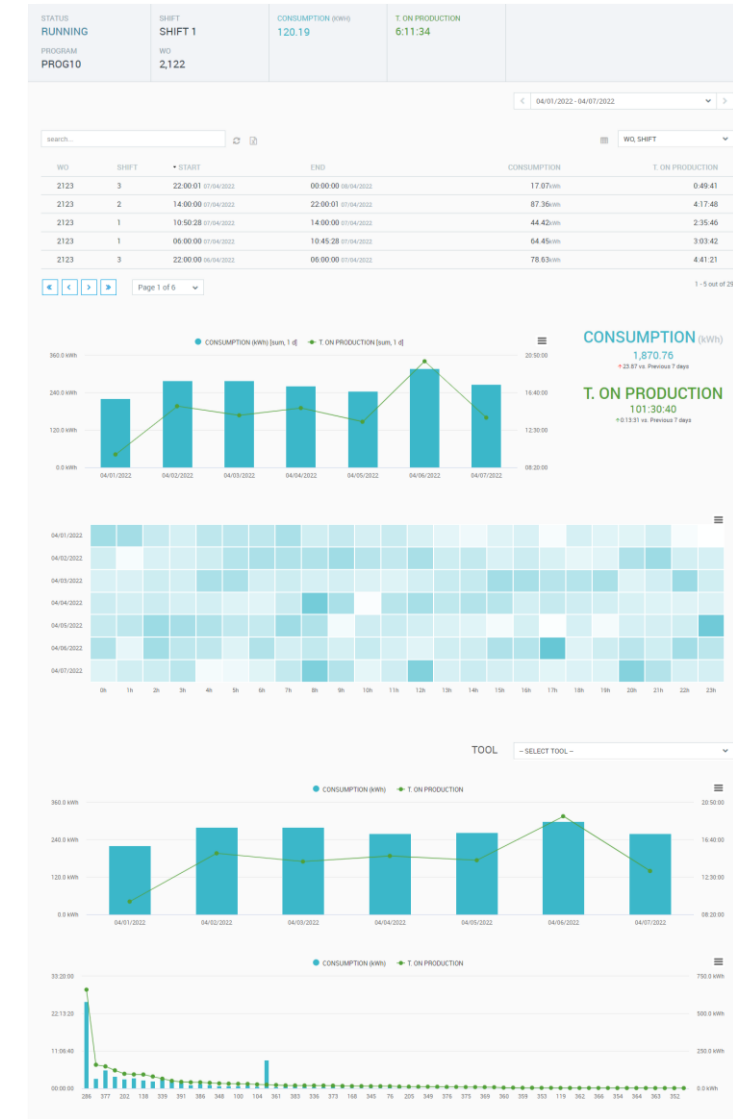
Production and rejections

Do I know the main production parameters?

Get actionable information about…

⊙ Overview of your machine's production, with progress vs. target comparison.

⊙ Production parameter exploration and cost vs. benefit analysis.

⊙ Rejection summary, with a breakdown by type, allowing you to compare them between dates.

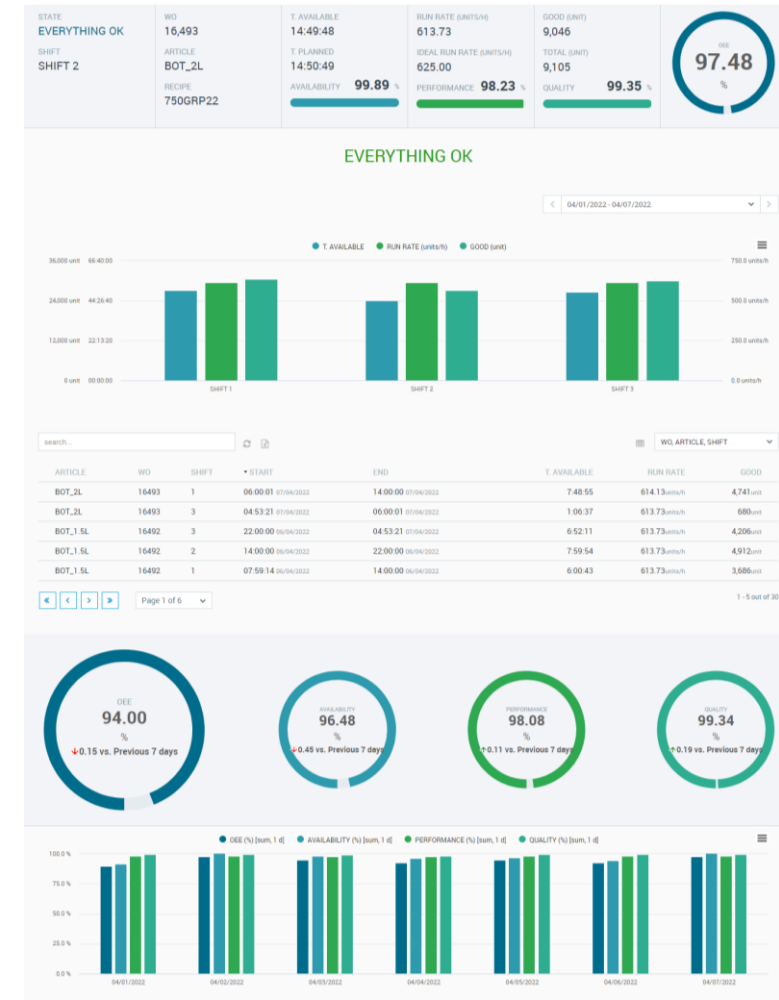⊙ Production exploration, rejections and losses per WO, shift, etc.

That will enable you to…

⊙ Know the days on which production yielded the highest profit.

Know the cost of rejects in production.

⊙ Correlate production data with business data.

Examples
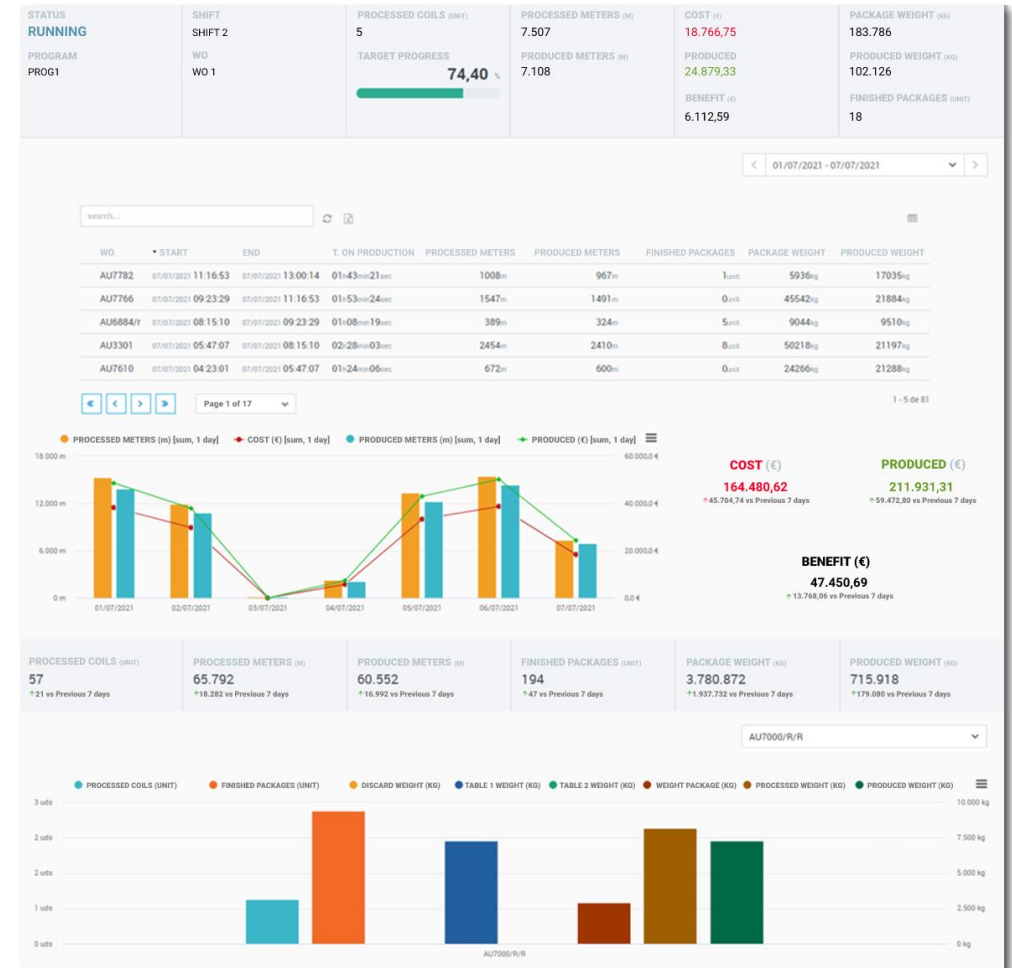
Measure and improve your OEE

- With the addition of the availability, efficiency and quality modules, you can measure in a single indicator how close you are to perfect production, both in real time and historically. In addition, you can compare your OEE progress with respect to previous periods, between shifts, work orders, etc.
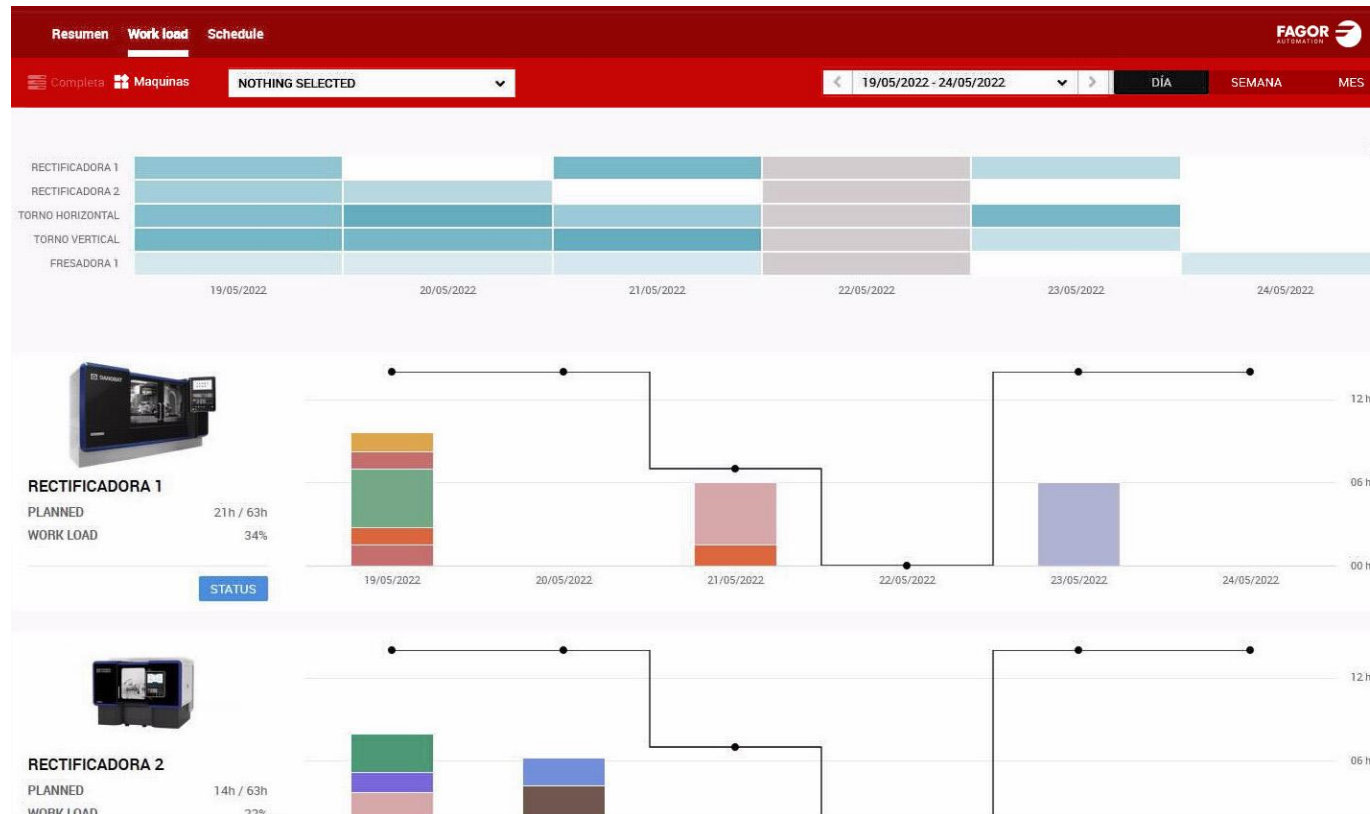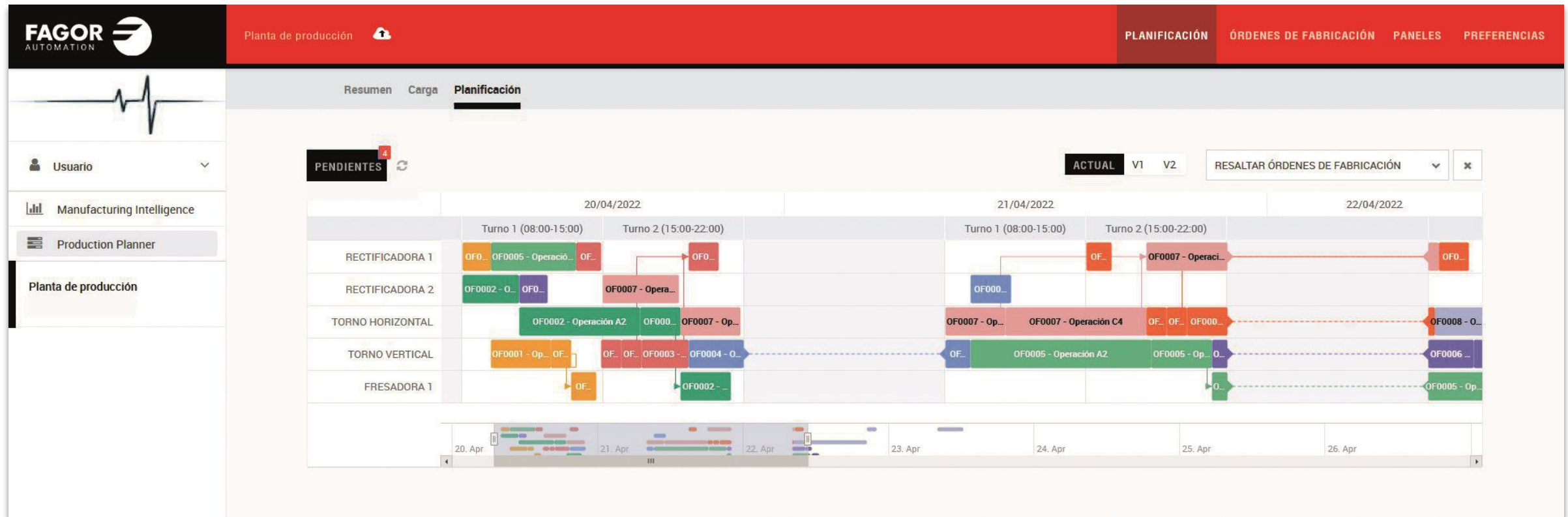
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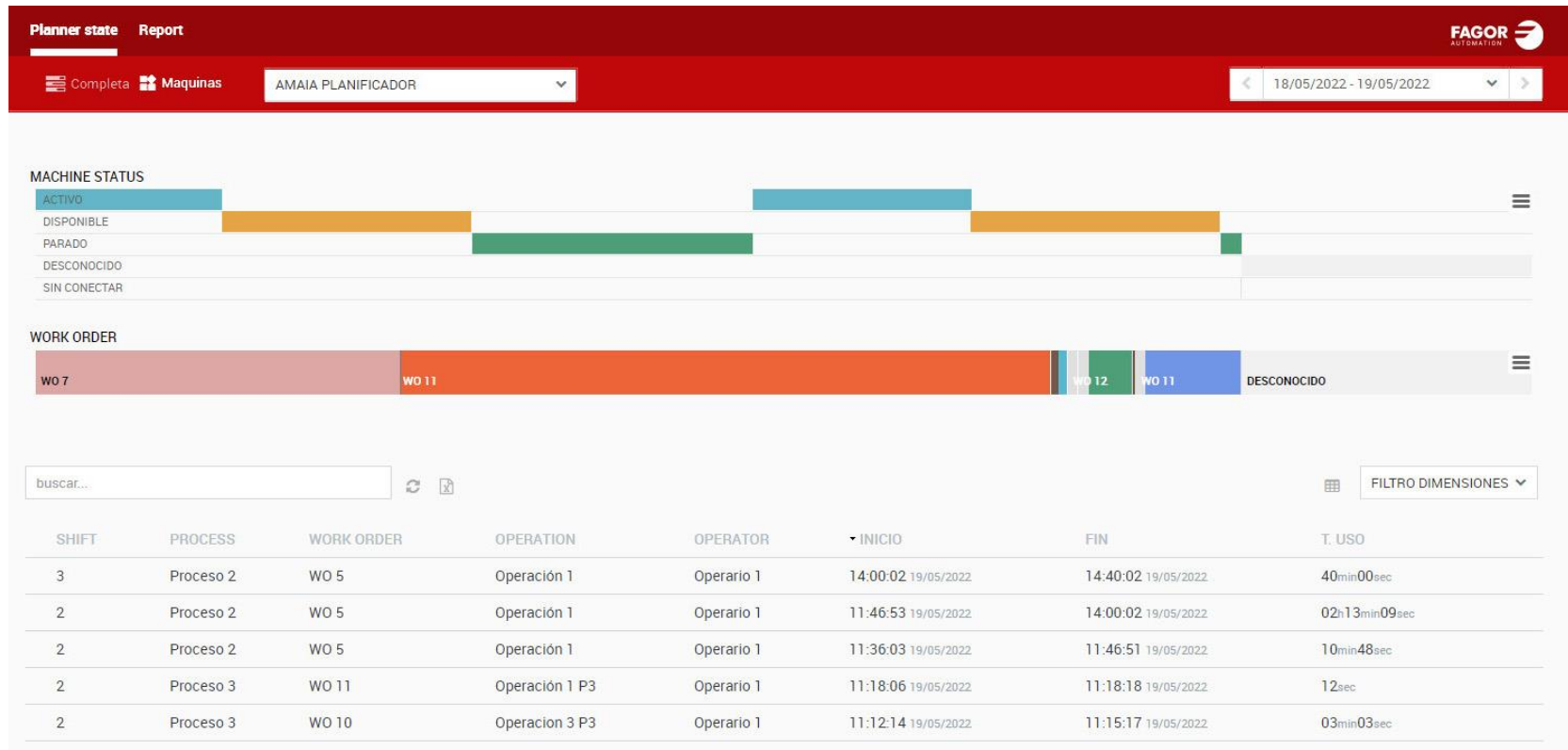
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www.fagorautomation.com/es/digital-suite

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