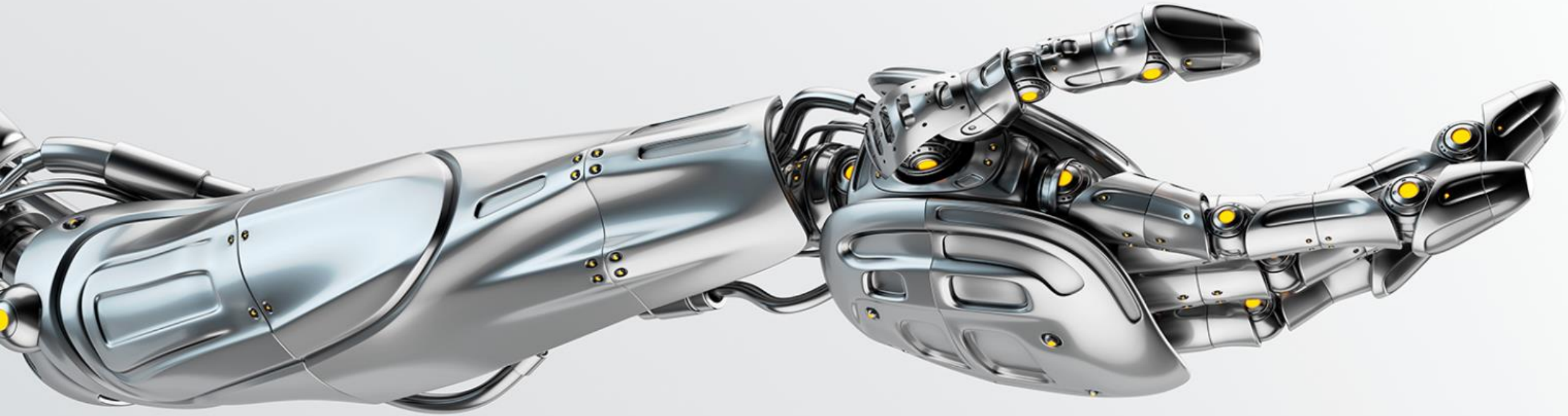
ELPLC



FUTURE AWAITS.

ELPLC

Software development areas

ELPLC SMART FACTORY

Move Your production into **Industry 4.0** world

AR/VR SOLUTIONS

New dimension of enginnering, **augmented & mixed reality.**

VISION SYSTEMS

Advanced solutions including **deep learning**

REAL TIME SYSTEMS

Fast & efficient solutions utilizing National Instruments

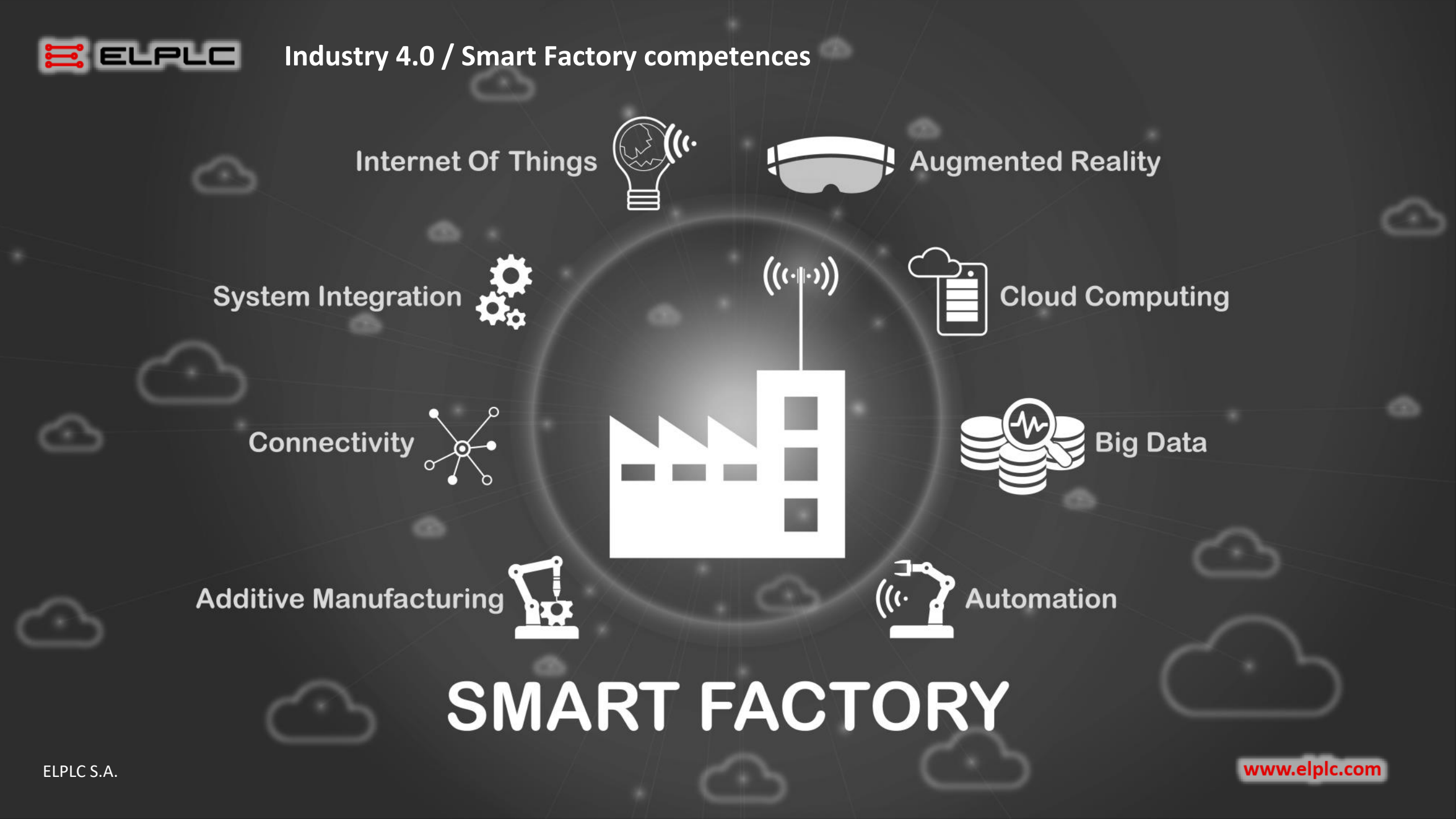
ETYKIETA SYSTEM NET

Tailored management system for industrial labelling

HMI SCADA

We create clear and useful interfaces

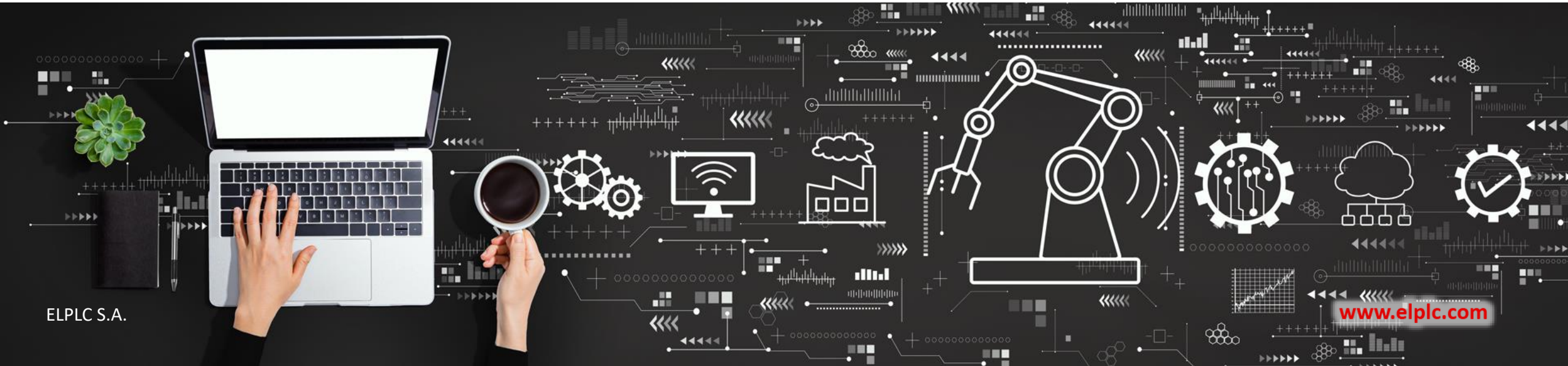
Industry 4.0 / Smart Factory competences



ELPLC SMART FACTORY

We have many implementations already and are still developing new modules, a comprehensive system, which collects, analyzes and uses huge data sets to meet the digital twin paradigm - digital reflection of the physical technology / assembly line.

Our system is aligned with the concept of INDUSTRY 4.0.



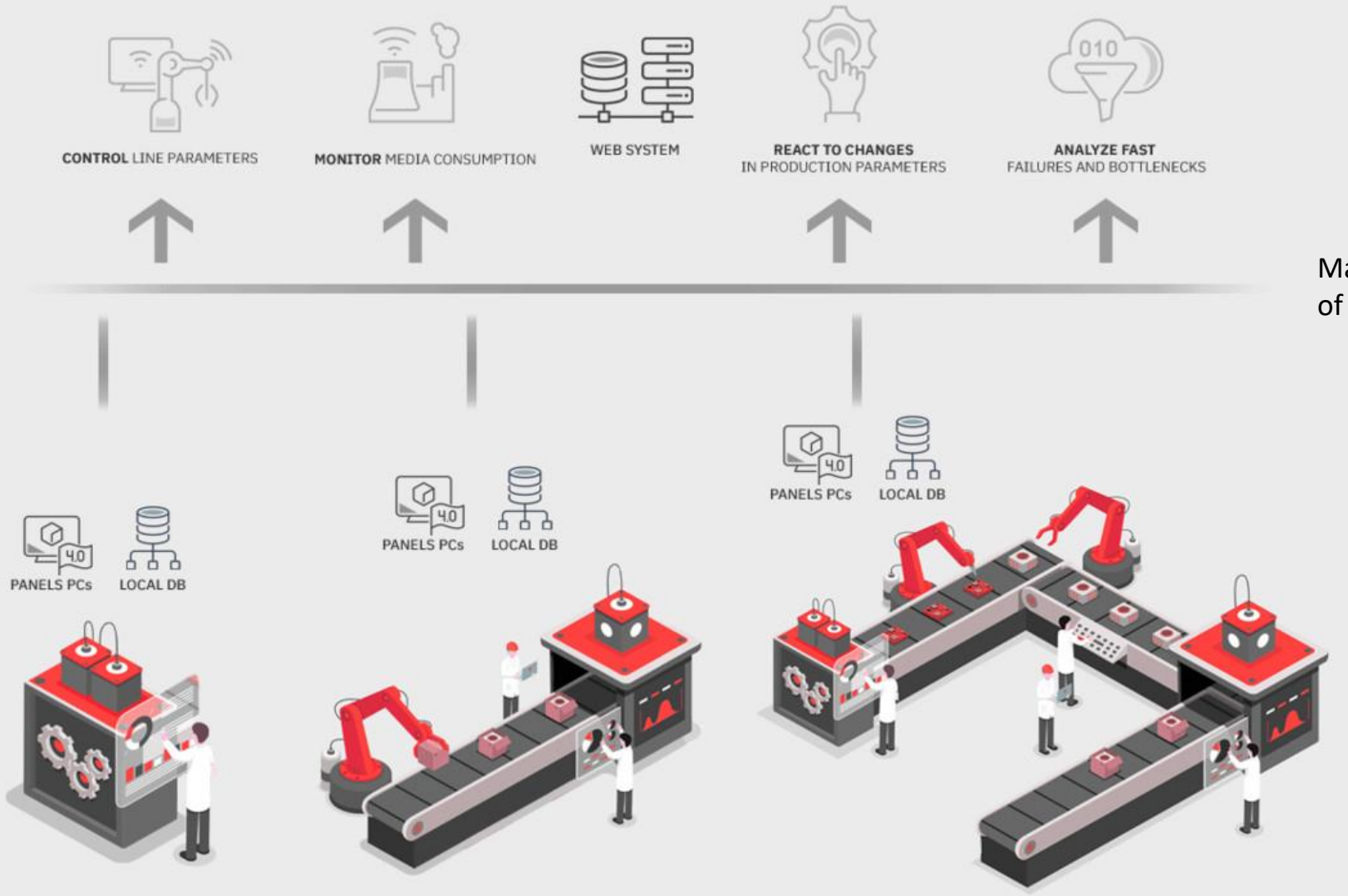
CONNECTIVITY & SYSTEM INTEGRATION

Flexible possibilities of integration with other systems, both when it comes to sending control data for production and collection of production data.

The system communicates with PLC devices from various vendors (e.g. Siemens, Mitsubishi, OMRON, Allen-Bradley, Beckhoff). Data collected during production is immediately available for analysis.

ELPLC Smart Factory – key information

Scallable data acquisition from line modules, stations PLCs or other units.



Making huge amounts of data useful

ELPLC SMART FACTORY

MONITORING APP

The main part of the system, currently 4 modules: data acquisition, line status monitoring, diagnostics and analysis of historical data and performance and failure rate analysis

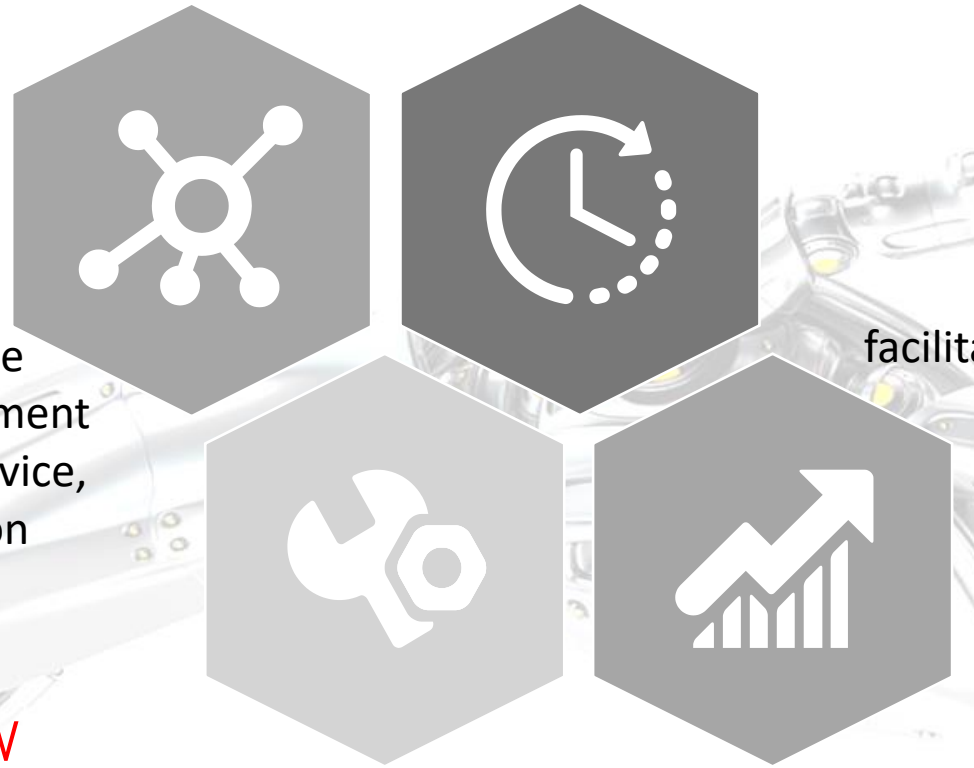
WEB APP

Access to historical data from anywhere in a company or anywhere in the world (VPN), any browser, any operating system.
Currently 2 modules: configuration and reporting

ELPLC Smart Factory – monitoring app modules

DATA ACQUISITION

Data from all PLC controllers, and available devices are saved to local MSSQL database and available for analysis, monitoring and management production recipes, authorization service, energy monitoring, damage prediction



DIAGNOSIS, HISTORICAL DATA ANALYSIS

Flexible and diverse reporting, facilitating the understanding of the data incoming from the system

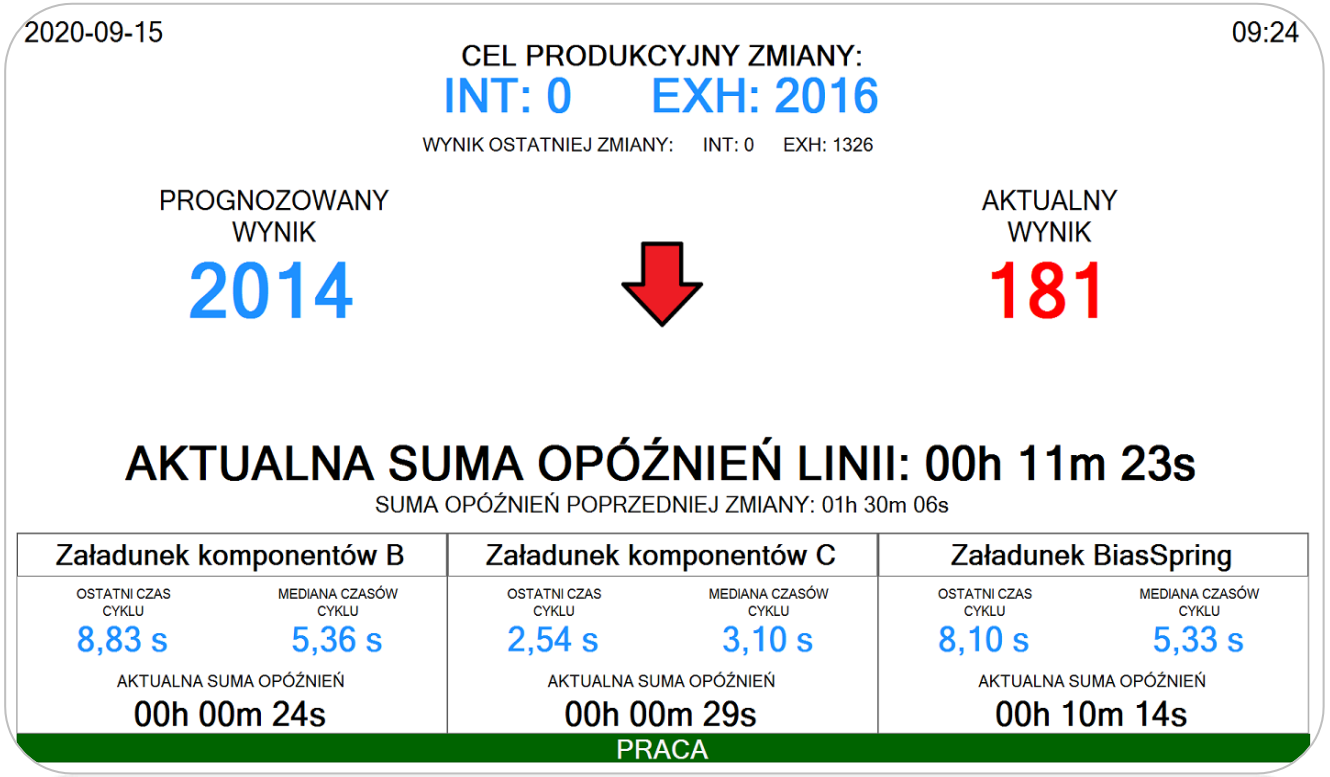
LINE CURRENT STATE PREVIEW

Preview of currently flowing data from the production line and real-time production tracking

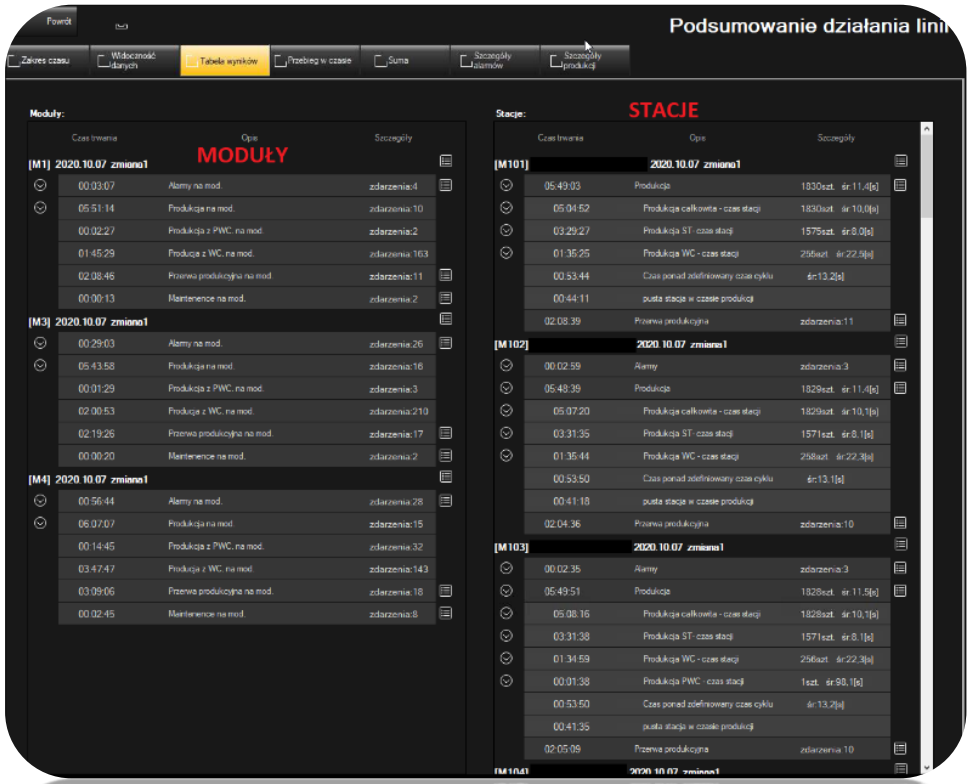
PERFORMANCE ANALYSIS LINE FAILURES ANALYSIS

The ability to determine the relationship between alarms on production modules, bottlenecks, the most common reasons for downtime, delays, jams, etc.

ELPLC Smart Factory – monitoring app sample screens

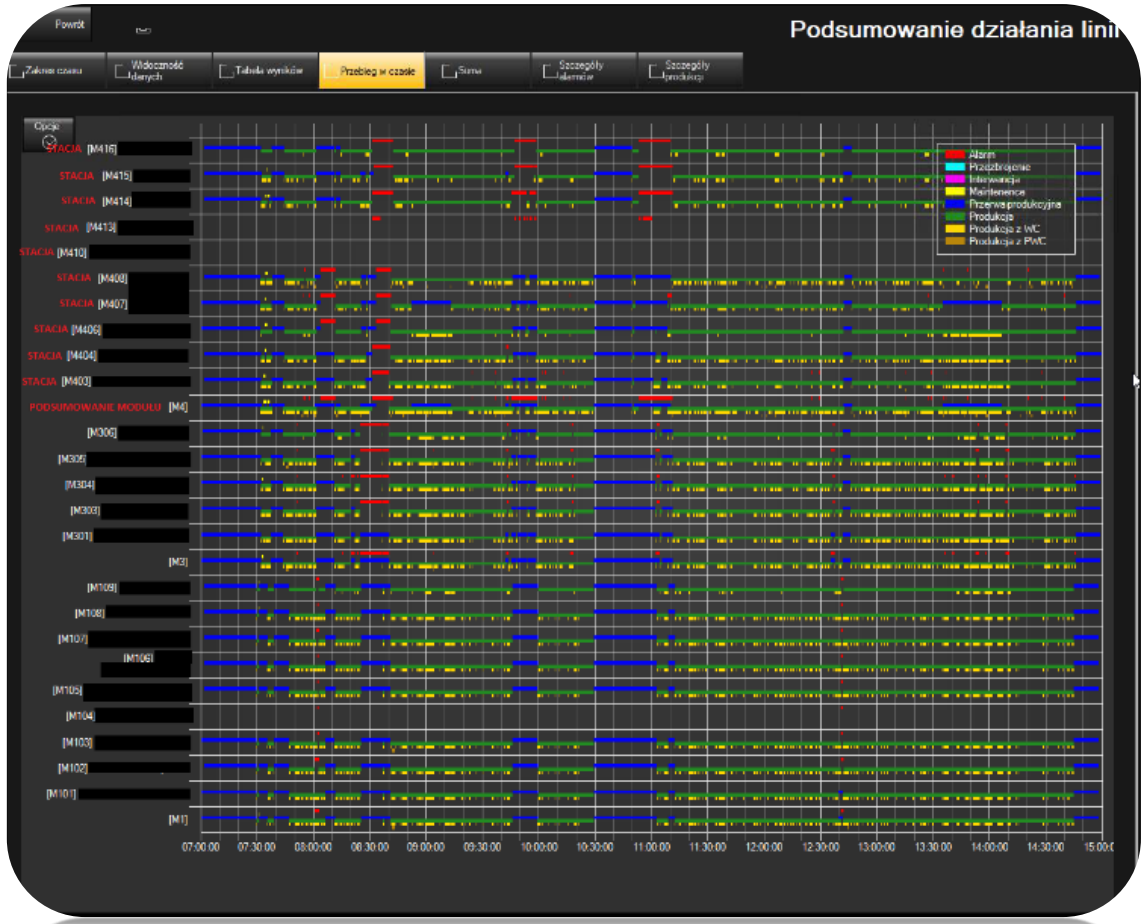


KPI screen

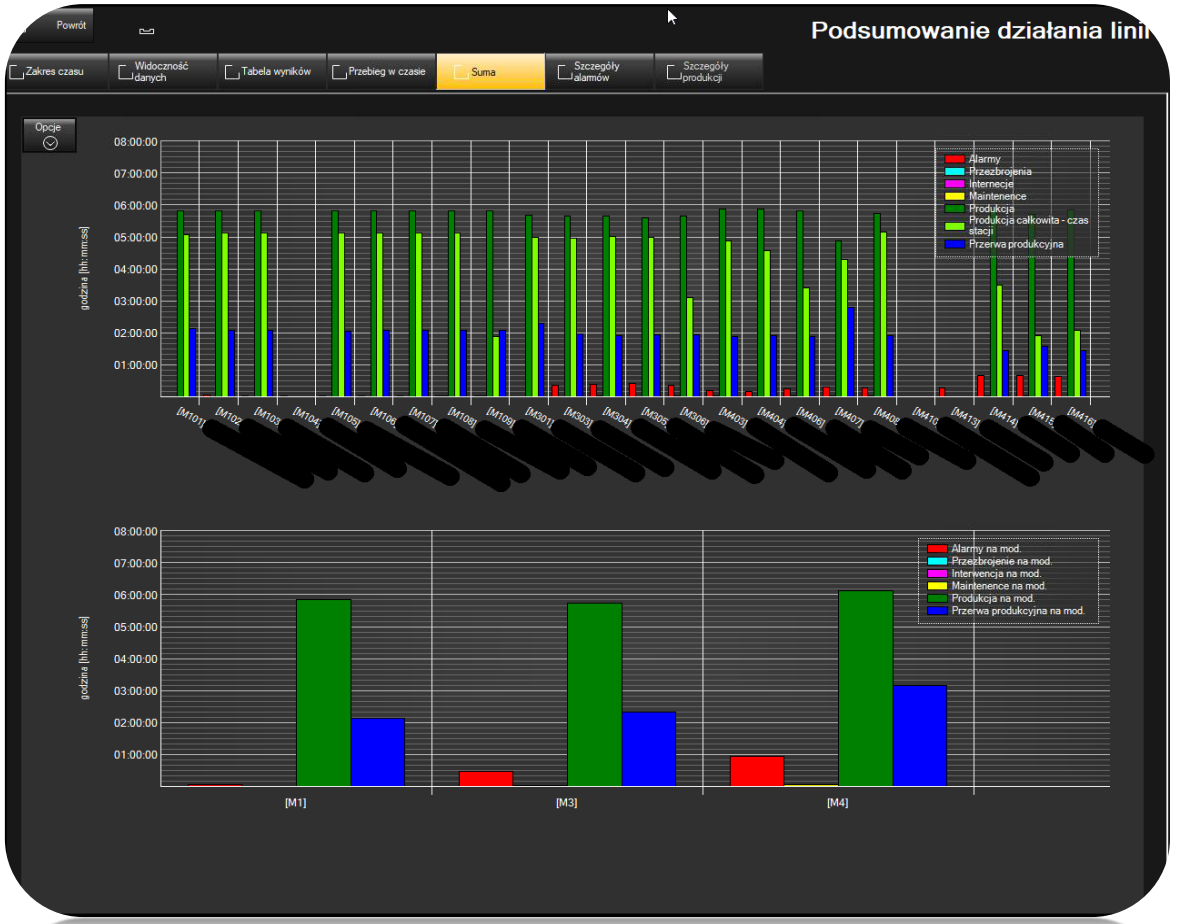


Events (production, alarms, breaks, downtime) grouped into modules and stations

ELPLC Smart Factory – monitoring app sample screens

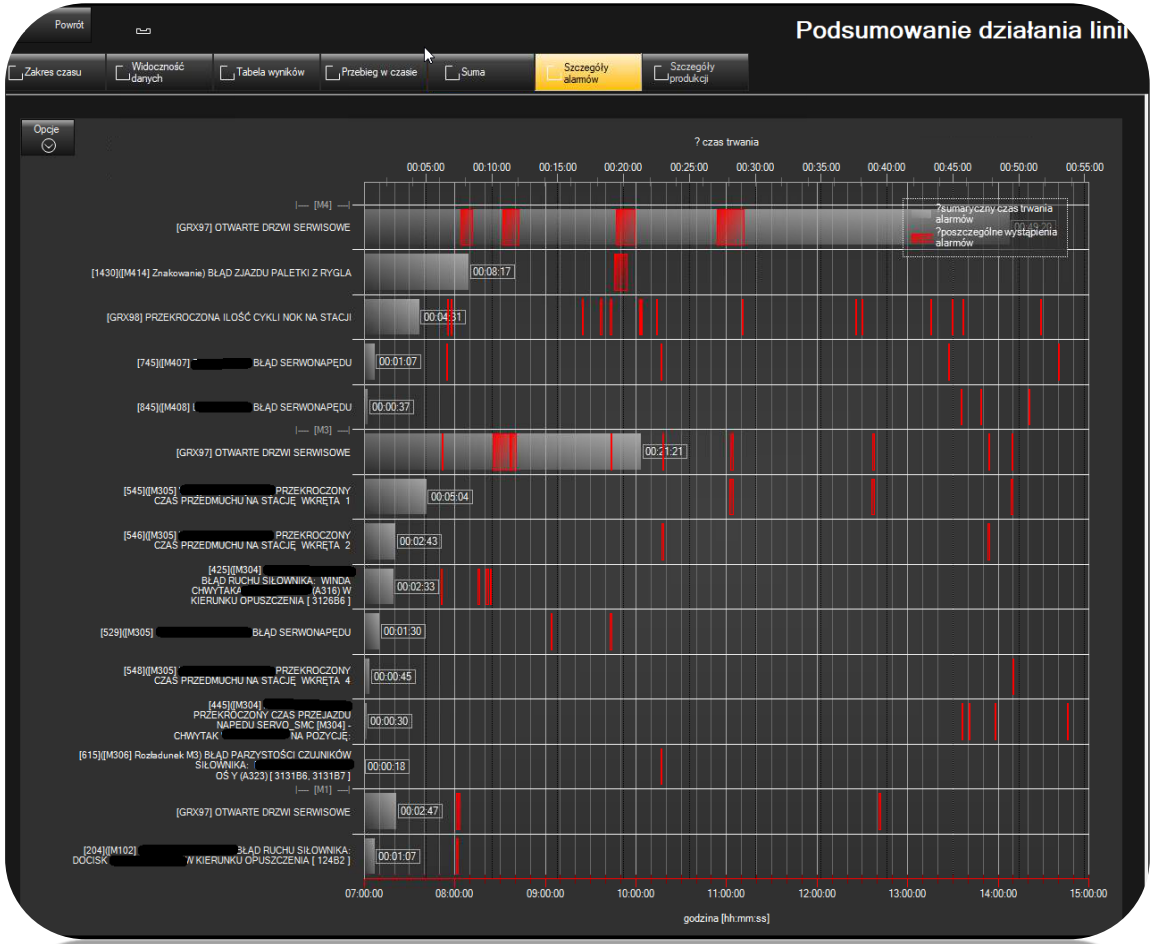


Time course of alarms, retoolings, interventions, line maintenance activities, production breaks …

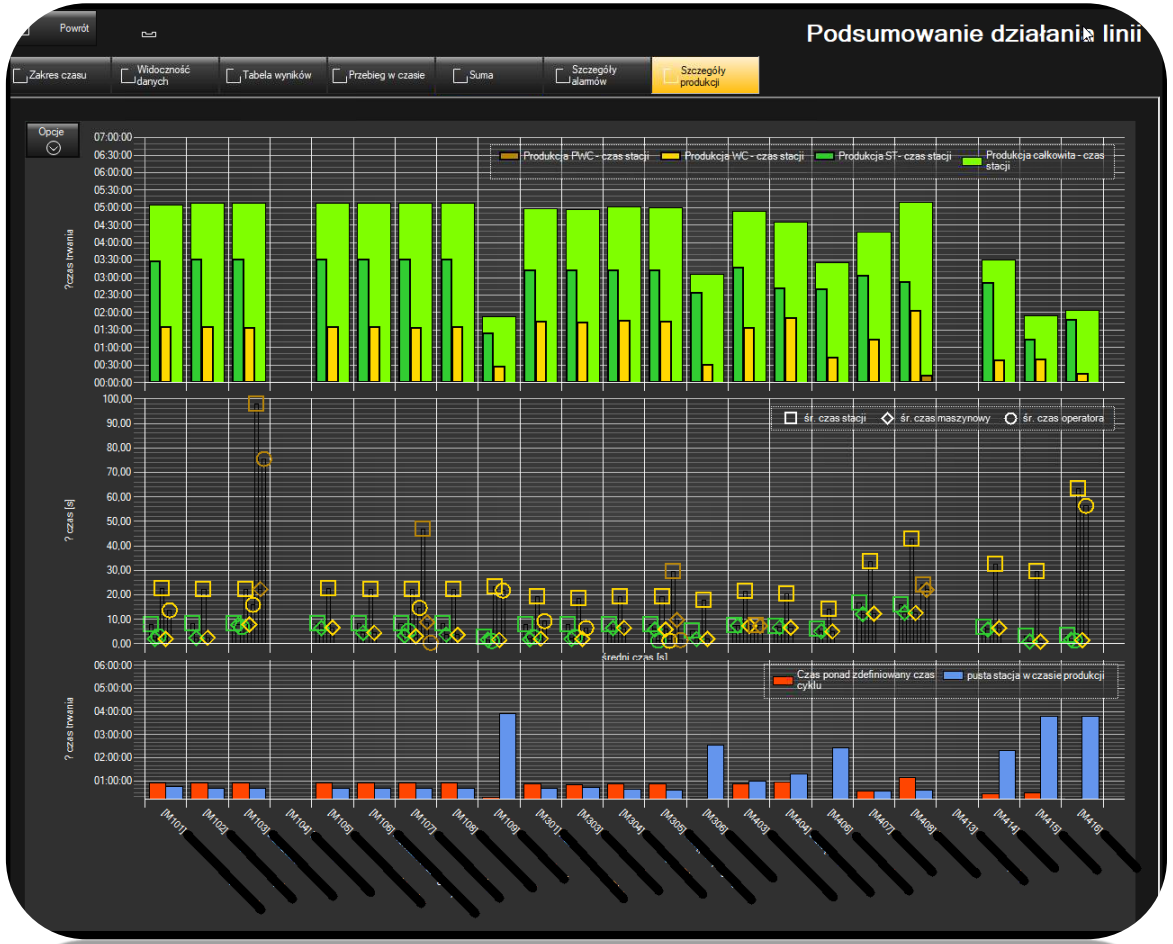


The sum of all events is presented in graphs, grouped by stations (top) and modules (bottom).

ELPLC Smart Factory – monitoring app sample screens



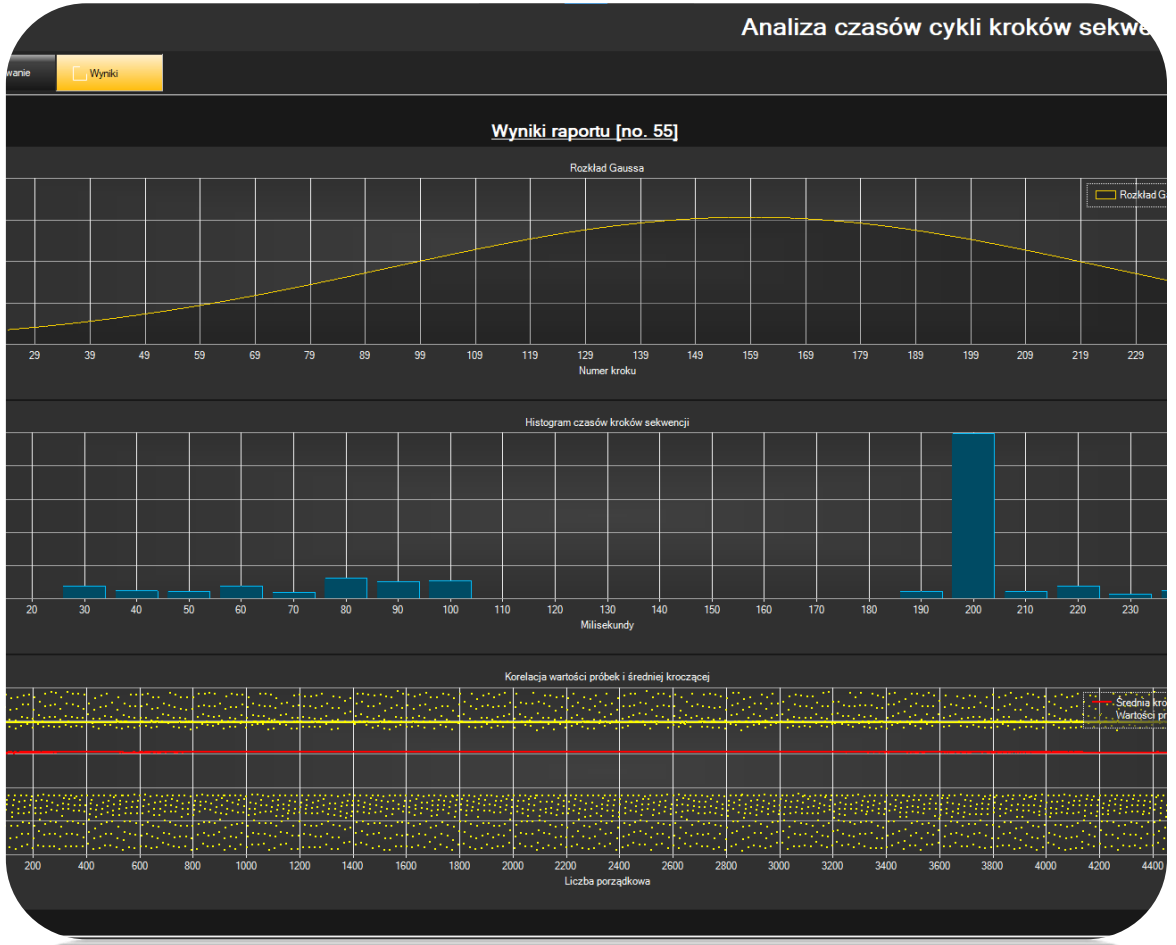
Alarm details shown in the chart
(in red when the alarm occurred in time)



Production details are presented in 3 charts.

ELPLC Smart Factory – monitoring app sample screens

Analysis of the cycle times of the controller sequence steps.
Duration stats of the steps along with standard deviation.



Analysis of the cycle times of the controller sequence steps.
Gaussian distribution, histograms and correlations.

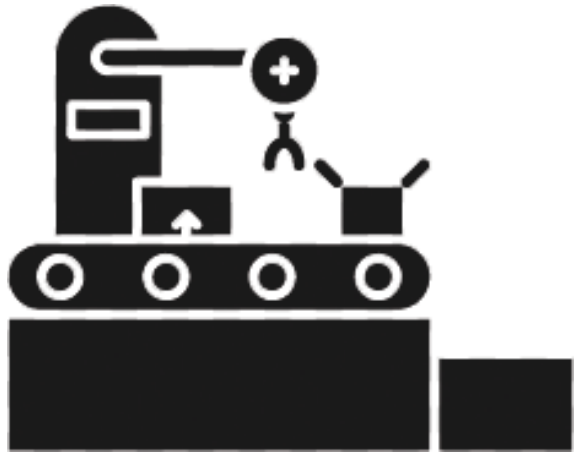
MULTI SYSTEM

Data analysis may be performed on:

- HMI touch panels
- Desktop computers
- Web browsers (web app)
- Tablet / Smartphone (Android, iOS)

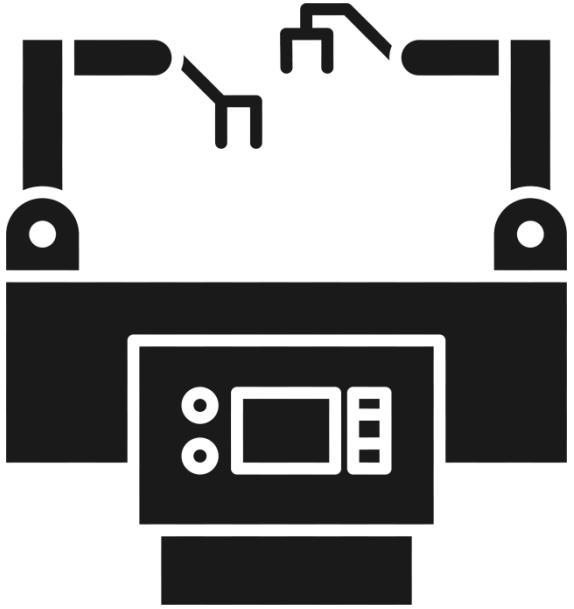
PARAMETERS ACQUISITION AND CONFIGURATION

- Centralized recipes management
- Export / import of recipes from external systems
- Recipies comparing
- Synchronization of recipes between machines



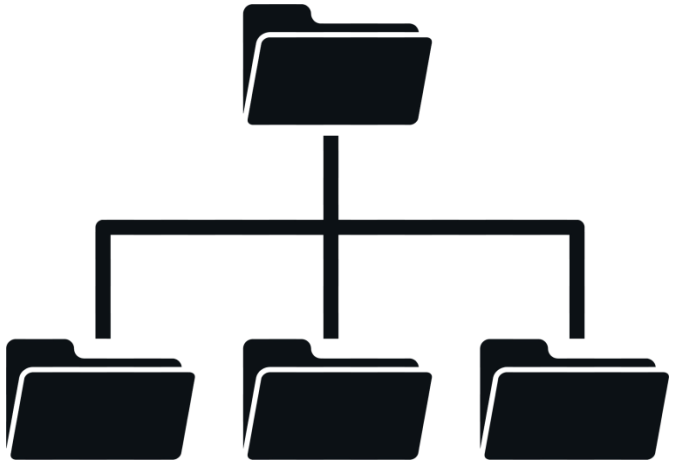
REALTIME PRODUCTION TRACKING

- Production preview for all line stations
- Handy parameters charts
- Parts in production process preview
- Detailed info about station alarms and statuses



PRODUCTION HISTORY ANALYSIS

- Full history & traceability of any manufactured part
- Data export
- Stations results comparison & analysis
- Production parameters dependency analysis
- Performance analysis (line, stations, operators)

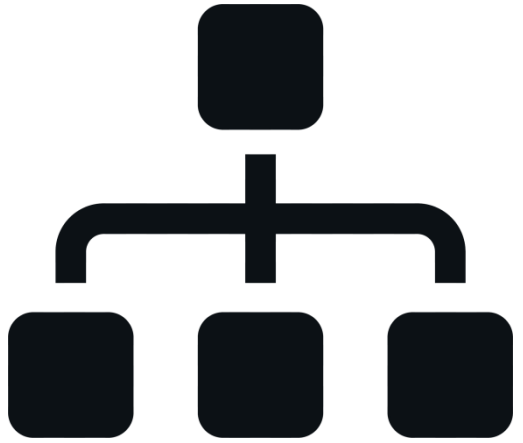


MEDIA CONSUMPTION & MAINTENANCE ANALYSIS

- Media consumption analysis
- Media consumption prediction
- Predictive maintenance
- Handy charts
- Dependency analysis of media consumption vs production line state

PRODUCTION SERIALIZATION

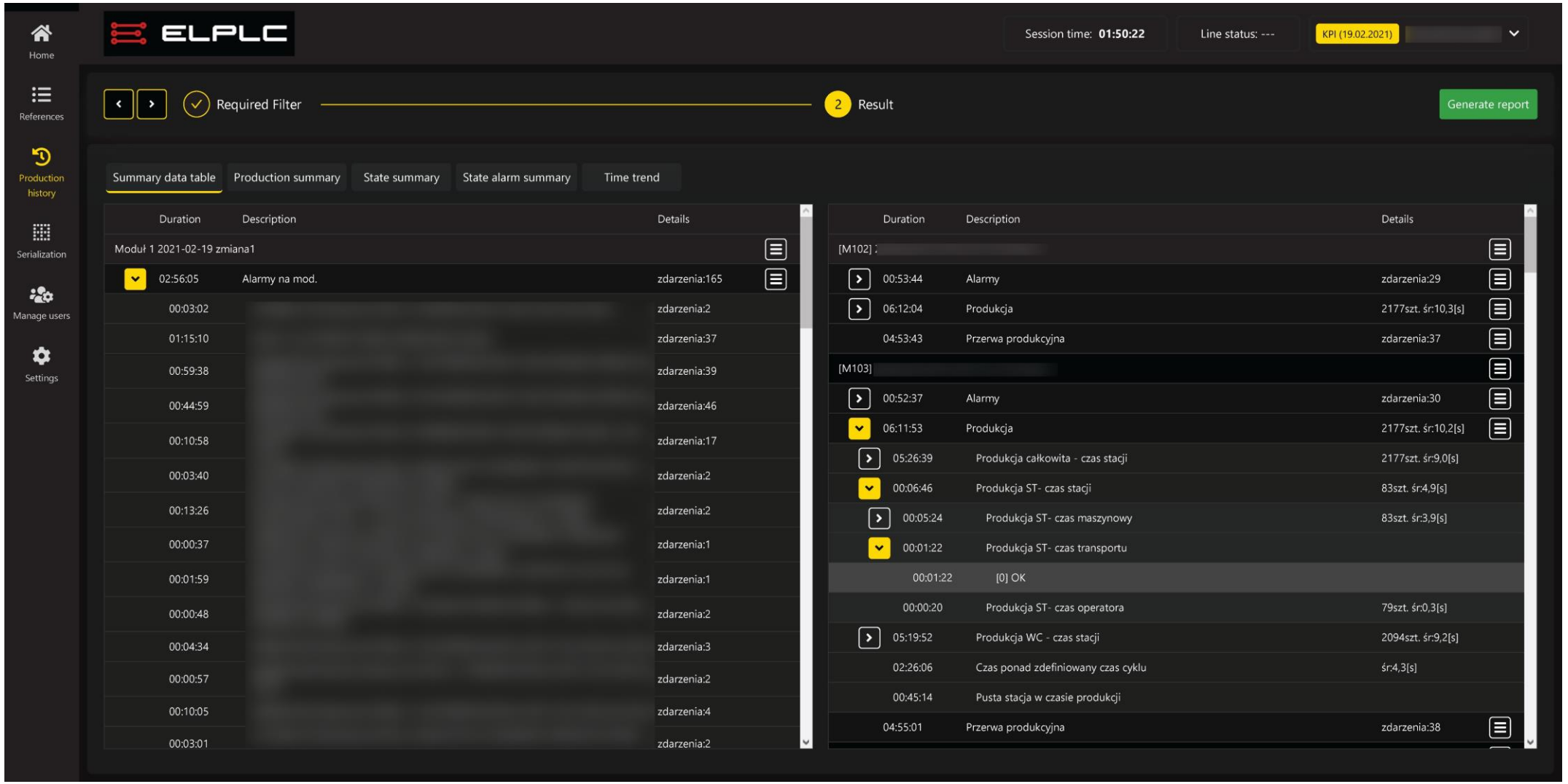
- Production & production tables setup
- Production progress tacking in real-time
- Production process supervising
- Operations correctness control



BILL OF MATERIALS (BOM) HANDLING

- Production materials control
- Warehouse analysis (materials availability)
- Monitoring of matierials use
- Analysis of proper material use in manufactured components

ELPLC Smart Factory – web app – stations states summary



Summary data table with line modules and stations

ELPLC Smart Factory – web app – production summary screen

INDUSTRY 4.0

Production ALL – summary production time
Production STD – production time with optimal cycle time
Production TLC – too long cycle summary
Production RTL – repeated too long summary

Point chart (colours as above) displays what causes bottlenecks:
◊ station mechanics malfunction
or
○ operator inefficiency
in realation to avg. station time (□)

Bottom bar chart displays stations time losses resulting from
Too long cycles and **idle periods (station empty)**

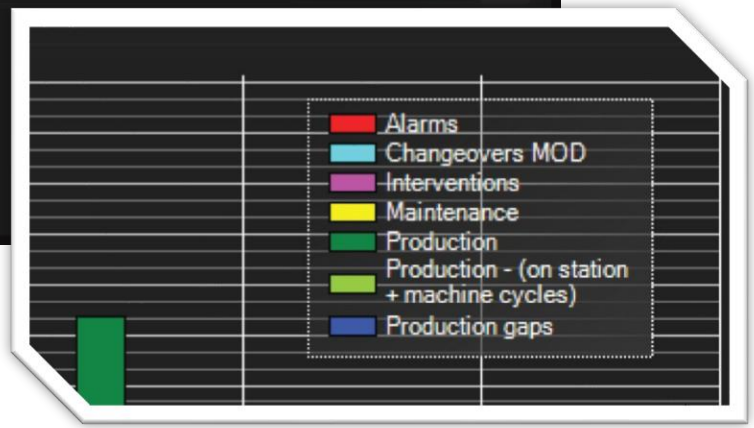
Production summary screen

Line bottlenecks detection & analysis

www.elplc.com

ELPLC Smart Factory – web app – stations states summary

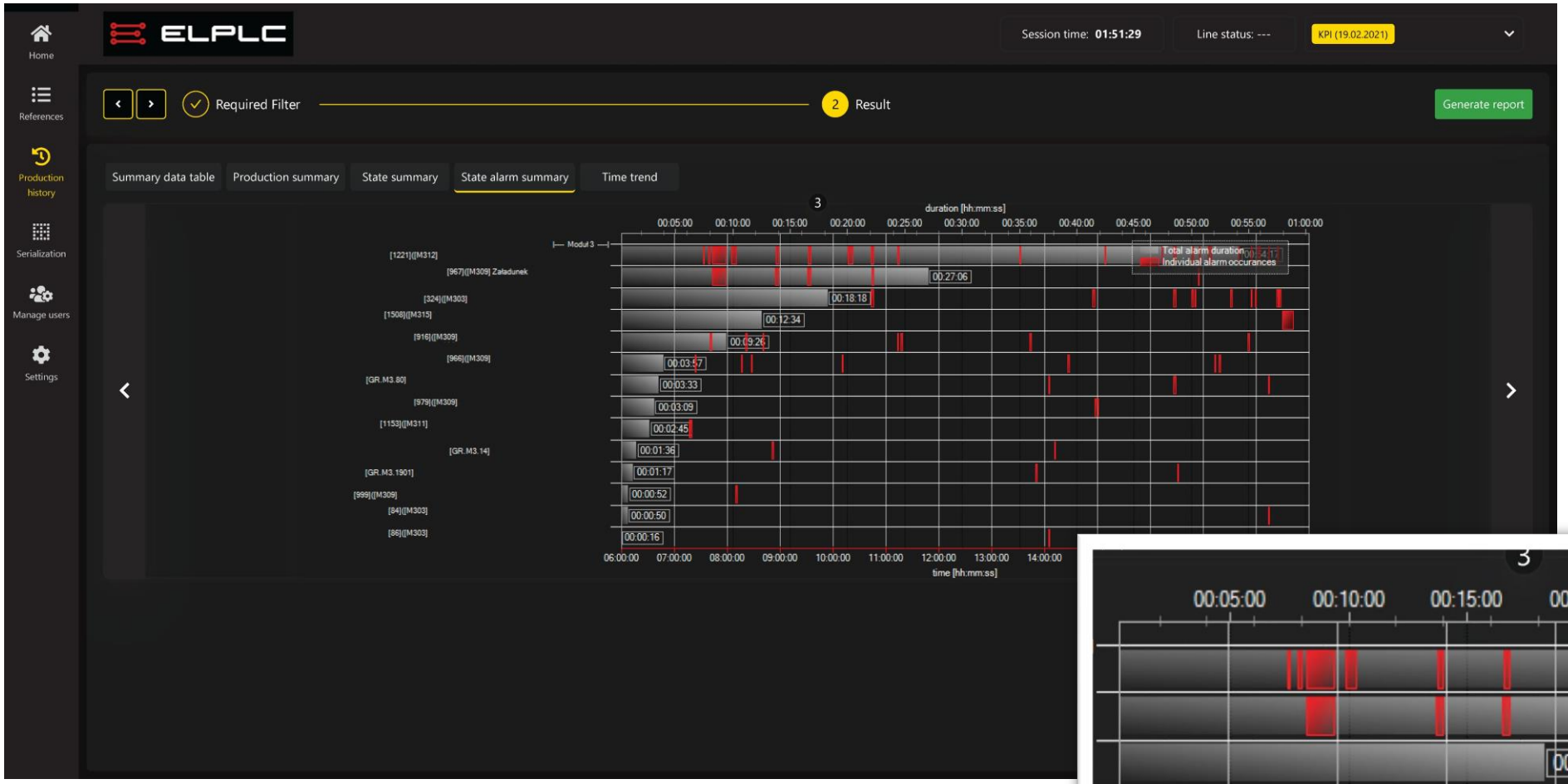
You can scroll stations using arrows



Station states summary

Summarizes information about states duration on each station

ELPLC Smart Factory – web app – alarm states summary



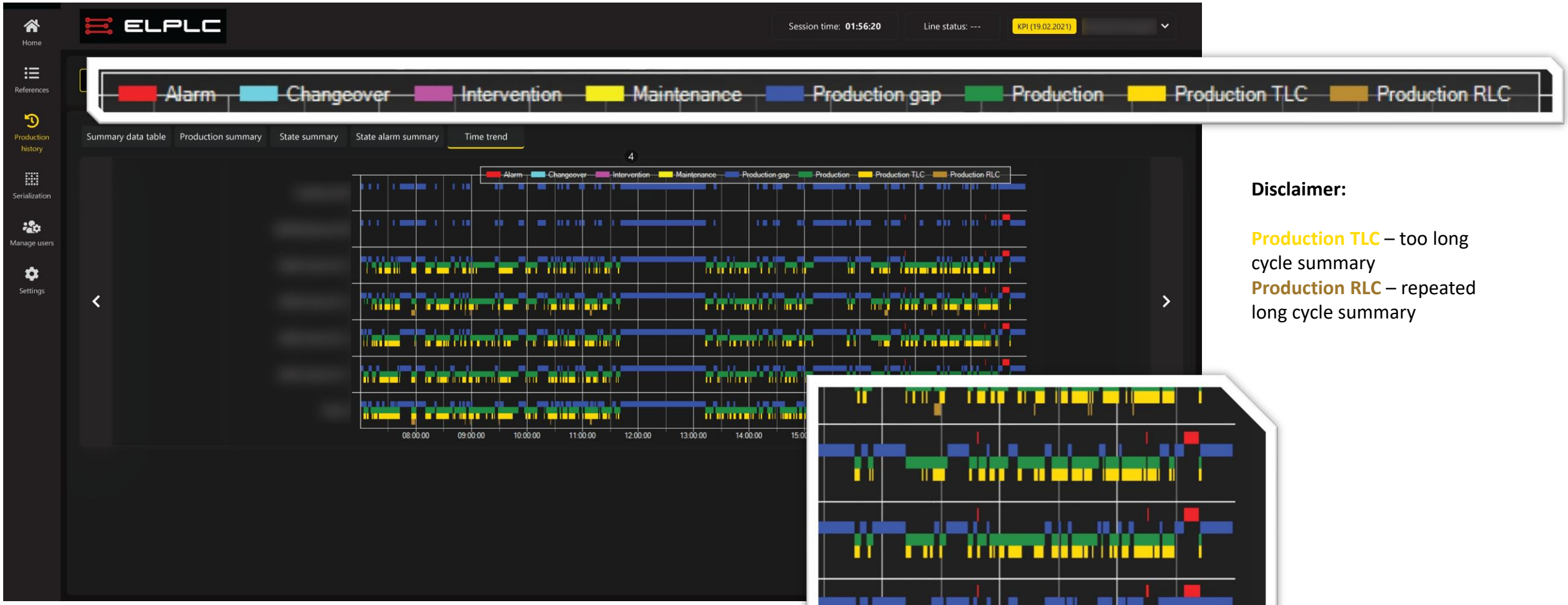
RED BARS – alarm state occurences with duration

GRAY BARS – summary alarm state duration

Alarm states summary

Summarizes information about alarm states occurences and durations

ELPLC Smart Factory – web app – time trend



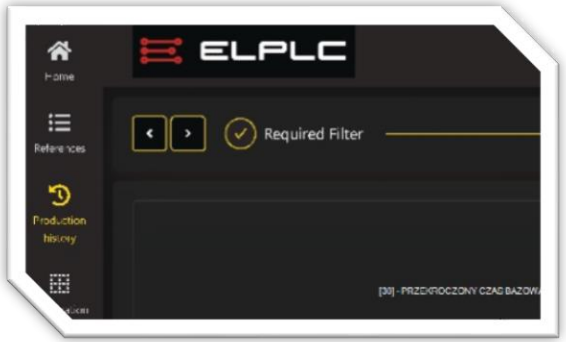
Disclaimer:

Production TLC – too long cycle summary
Production RLC – repeated long cycle summary

Time trend

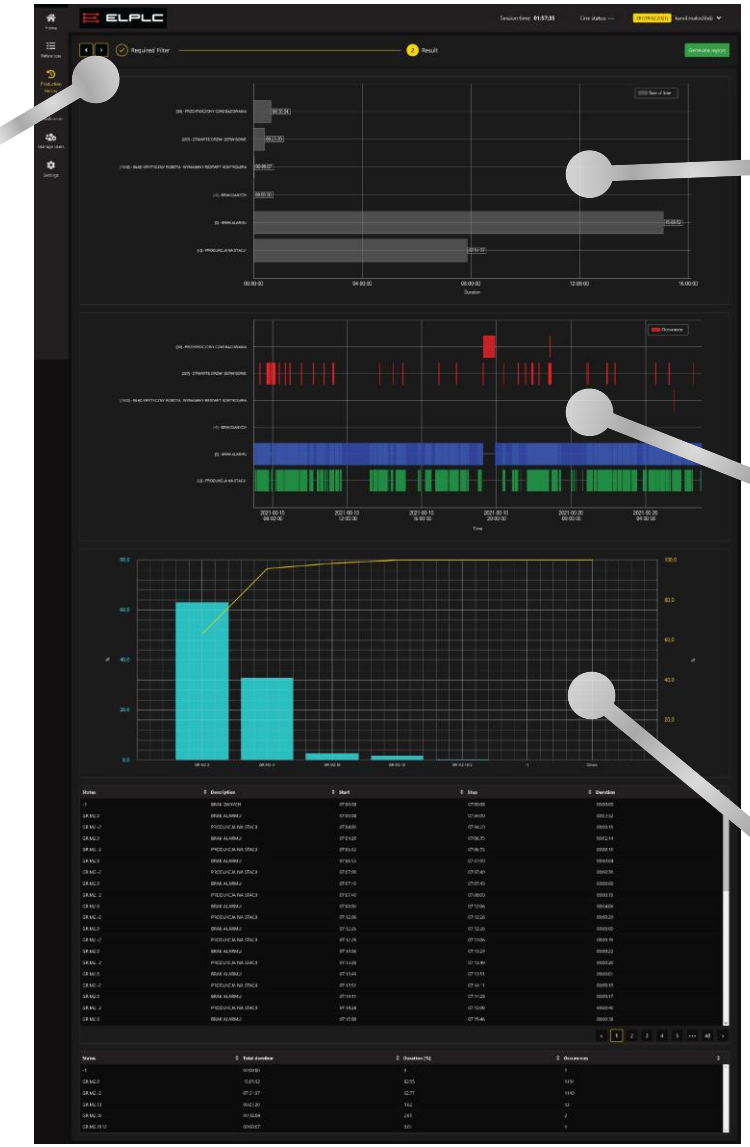
Summarizes information about all types of station states occurences and duration on time axis

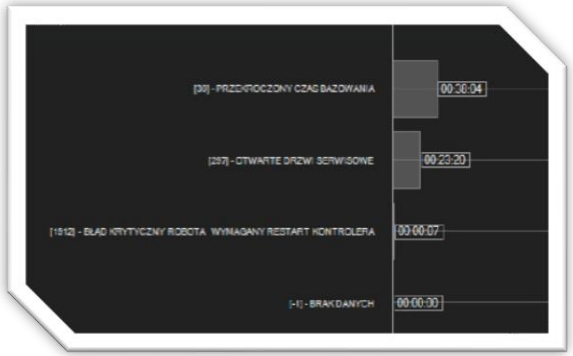
ELPLC Smart Factory – web app – station alarms screen



Station alarms

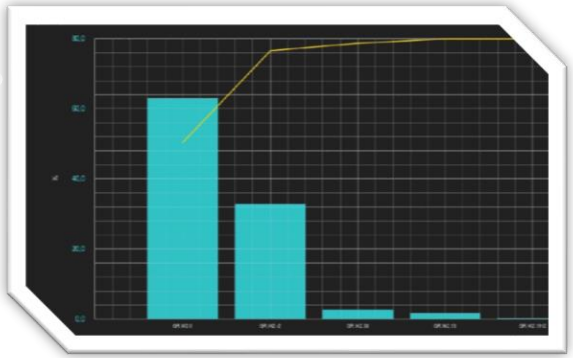
Station may be selected using required filter





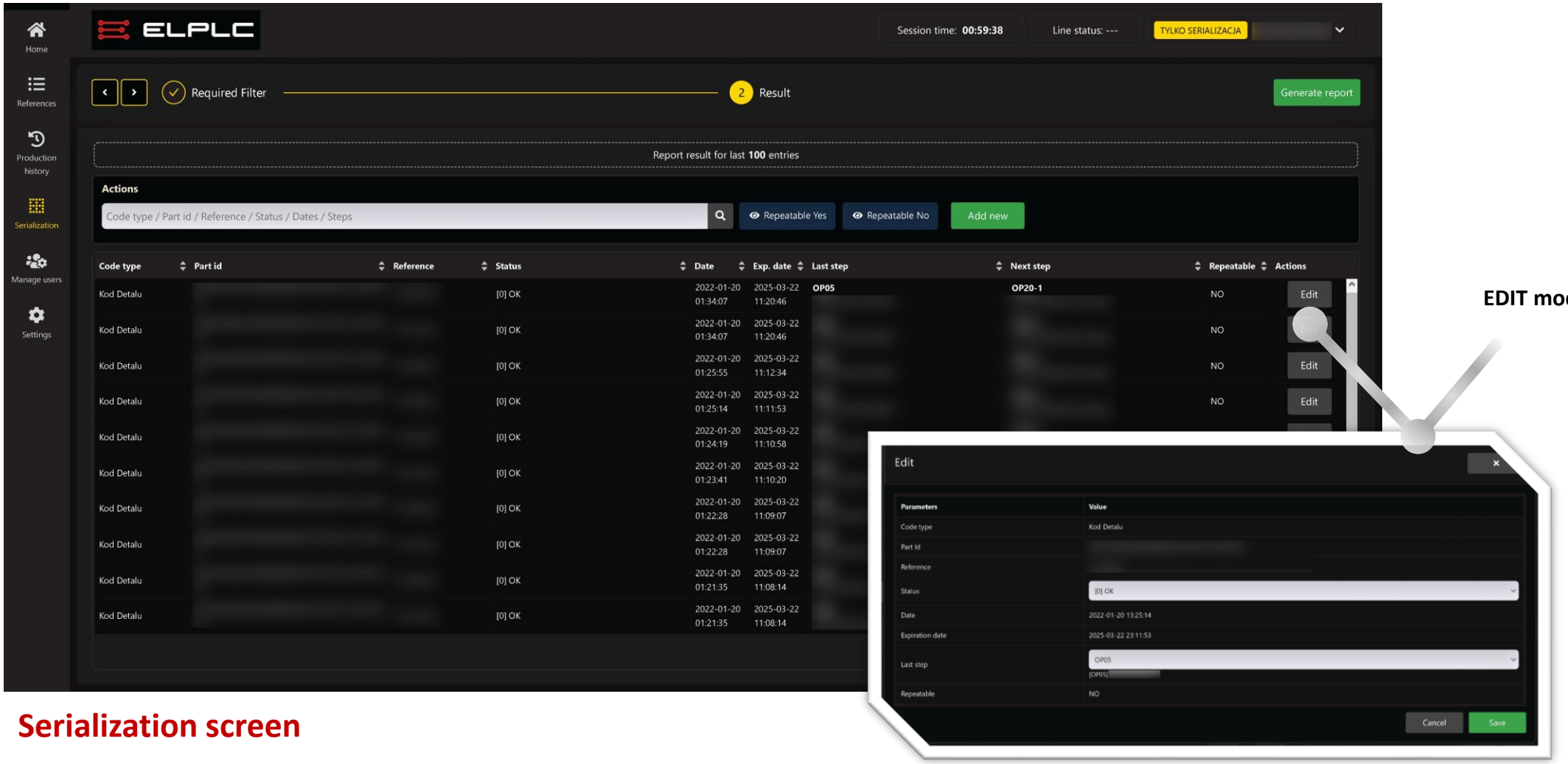
Gray bars on this chart shows duration times of station statuses

Chart with timestamps
Red bars – alarms
Blue – machine working without alarm (production & idle)
Green – production time



Pareto chart
Most common station statuses analysis

ELPLC Smart Factory – web app – serialization

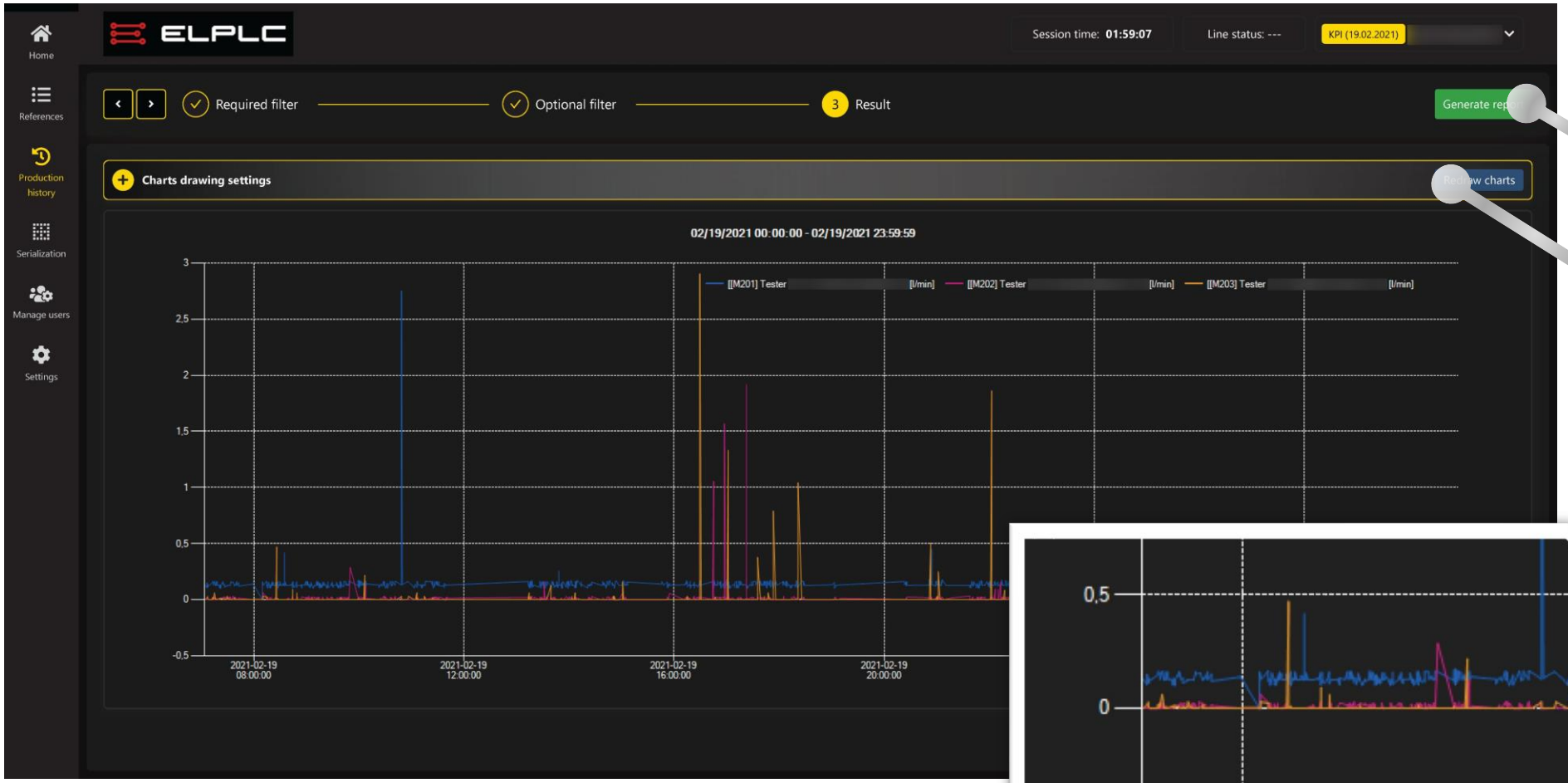


EDIT modal box

Serialization screen

Tab data to evaluate proper production part flow through stations

ELPLC Smart Factory – web app – parameters charts

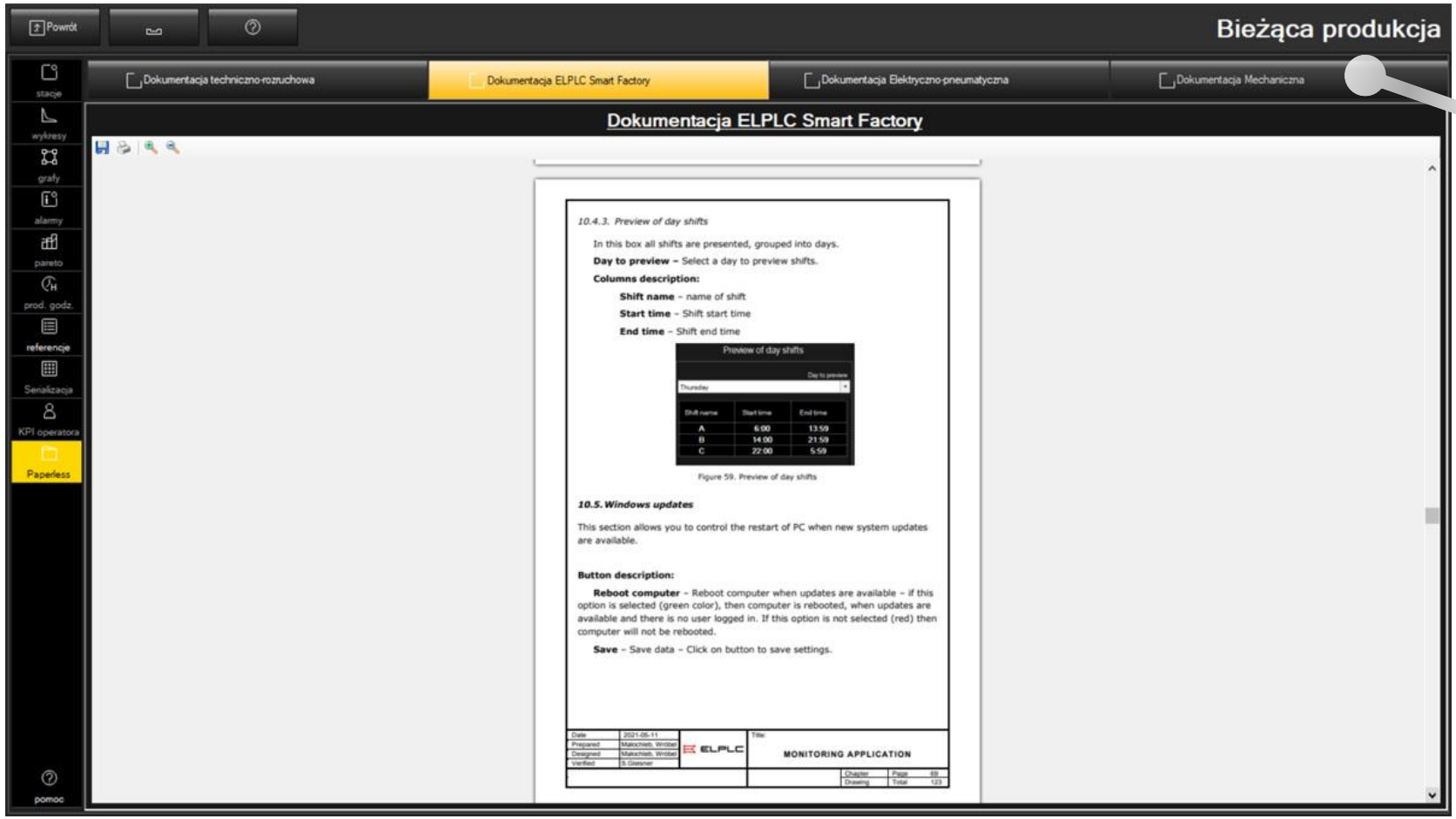


You can select station and parameters using **filters**

You can **change chart drawing parameters**

Parameters charts screen

Allows for station parameters analysis, comparison, anomalies and deviations detection

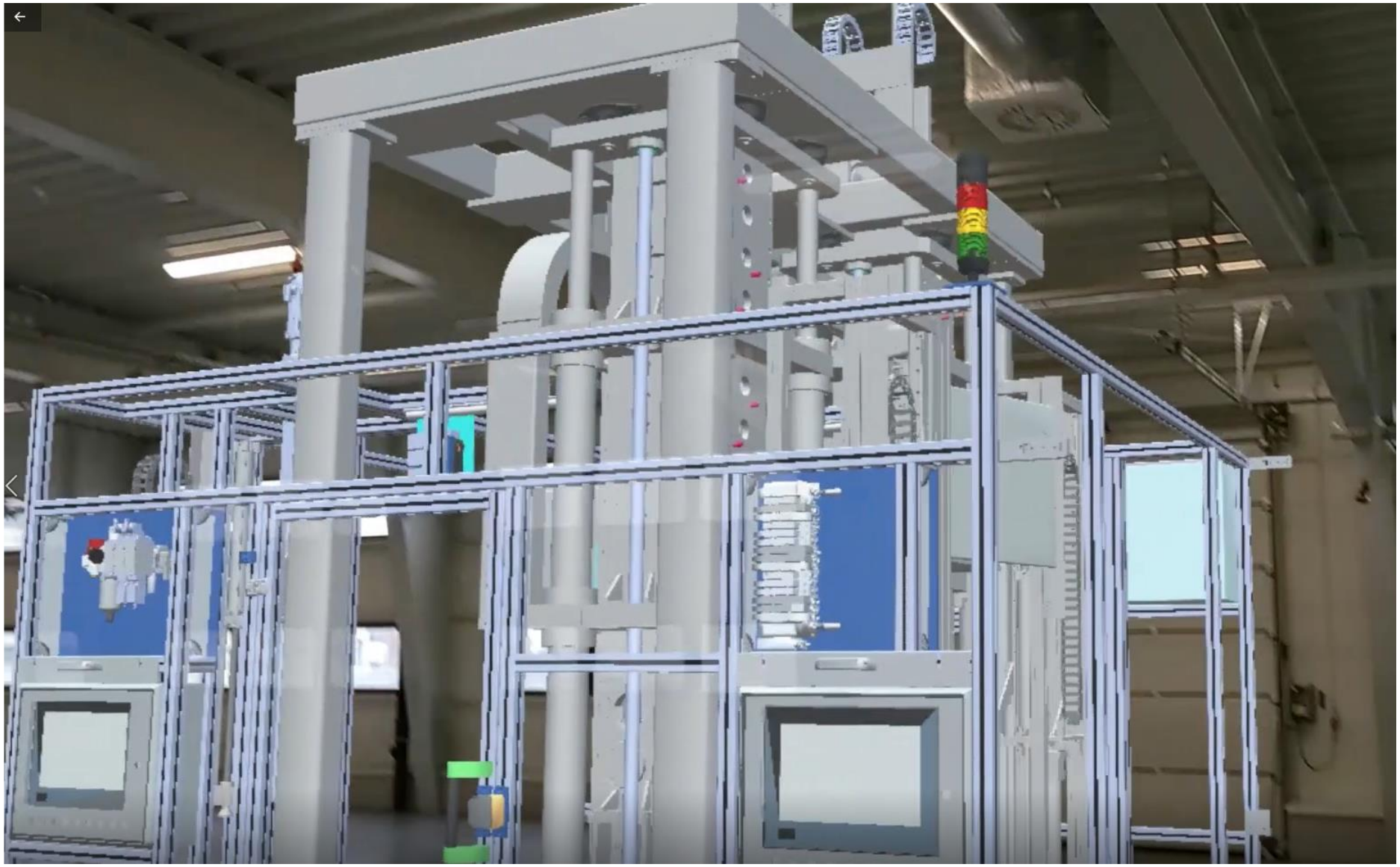


You can select technical documentation branch

Paperless

Abandon or reduce use of paper documentation. PDF format files available on HMIs and / or digital twin / augmented reality assisted quides with AR lenses.

ELPLC Smart Factory – developing future – augmented reality (AR)



With Microsoft HoloLens2

Contact us!

sales@elplc.com
+48 14 656 66 03

ELPLC S.A.
33-100 Tarnów
ul. Rozwojowa 28

www.elplc.com
KRS: 0000741812
NIP: 5252646827