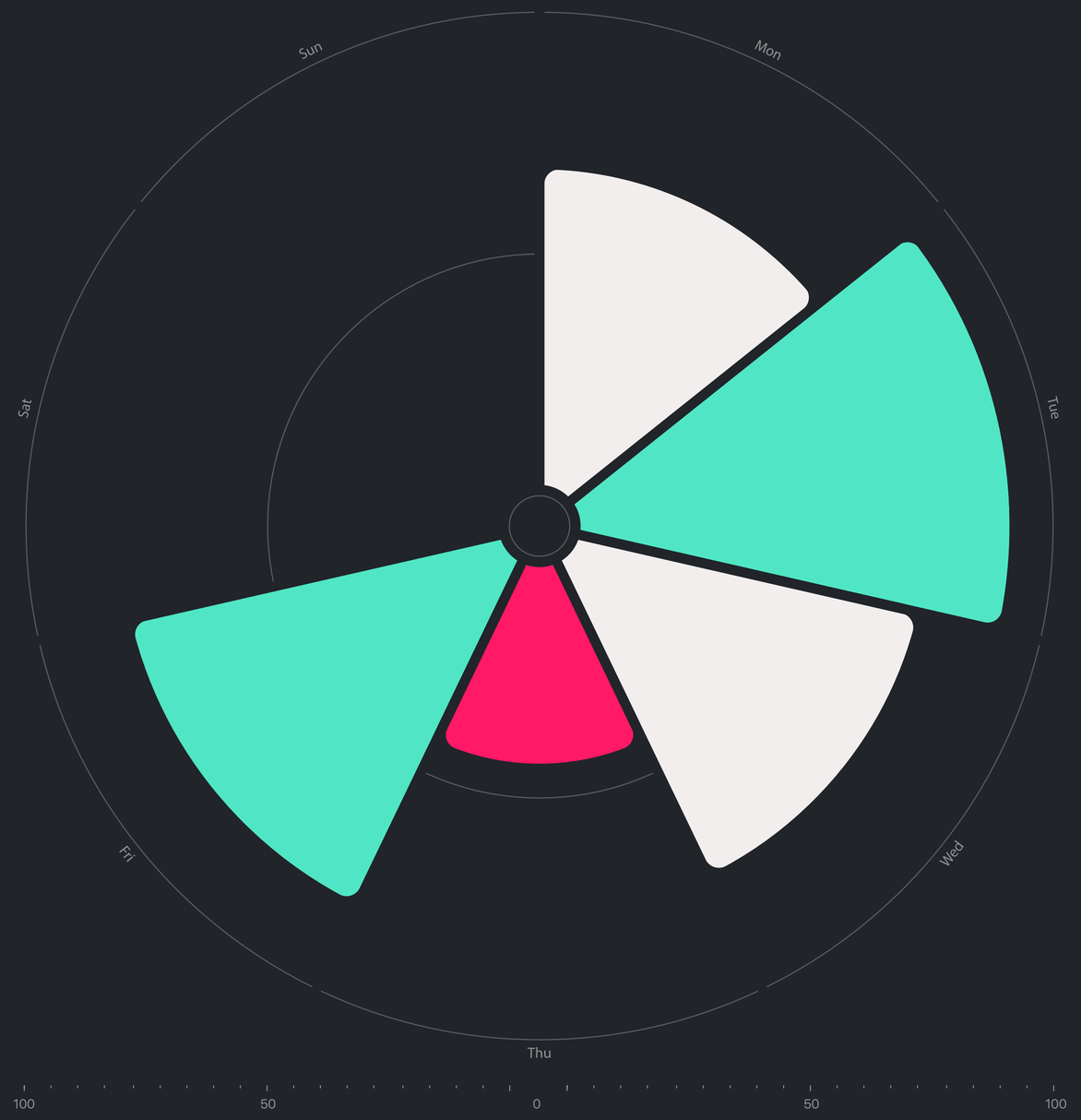
Schneider Electric
LMS Life

Next Generation
Line Monitoring System



Starting Point

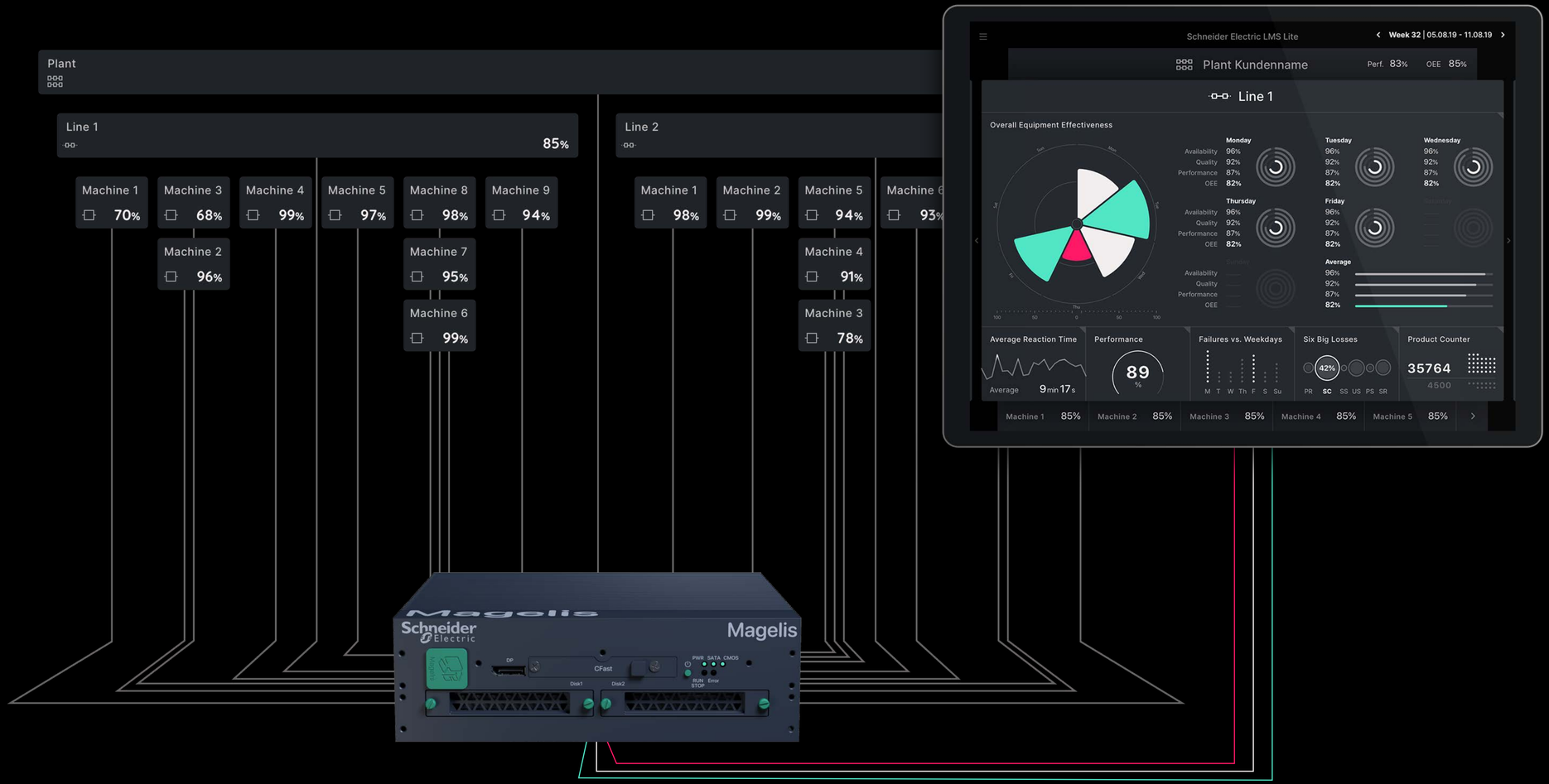
Context

- Line monitoring system for smart data processing
- Industrial IoT application
- Collection and analysis of plant, line and individual machine production data
- Evaluations of OEE, performance, downtimes, etc.
- Target group: Plant and shop floor managers
- Support in determining potential for error reduction and production optimization

Design Challenges

- Visualization of complex processes and bulk data
- Individual requirements for various types of analysis results
- Navigation in a complex plant structure
- Conception of usability-optimized analysis tools and features
- Application for a wide range of monitor sizes and touch devices

Industrial production environment



User Experience

Principles

– User-centered approach, optimized for the individual requirements of the user groups
– Rapid access to all information levels using intuitive navigation principles and gesture control
– Quick overview of important analysis topics via customizable dashboards
– Drill-down principle to switch from plant via line to the machine level
– Continuous monitoring of all aspects of the production process
– Analysis topics are bundled in widgets and are modularly applicable
– Easy to understand visualization of data via specialized infographics

Global Background Level
With menu, settings, time range filter

Plant Level
With client logo, plant name, widgets, etc.
Cumulated data and evaluation

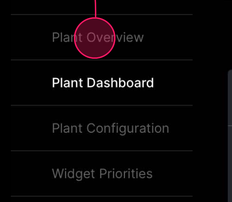
Line Level
With current production, line name, widgets, etc.
Horizontal navigation between several lines

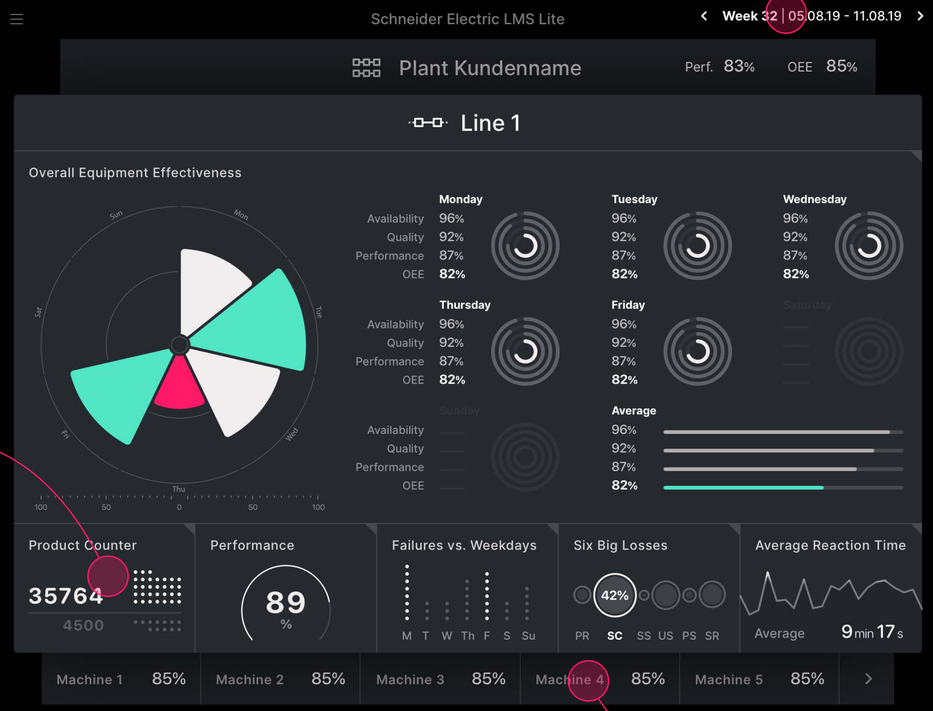
Machine Level
With lower-level single machines,
Current performance, widgets, etc.
Horizontal navigation between several machines

User Experience

Principles

– Setup of plant structure and configuration of dashboards
– Access to certain time frames and historical data via date picker control
– Easy-to-read data via customizable trends and specialized infographics
– Quick recognition of correlations and error reasons through smart filters
– Further research options via cross-links and compare functions
– Clear visualization of the plant structure





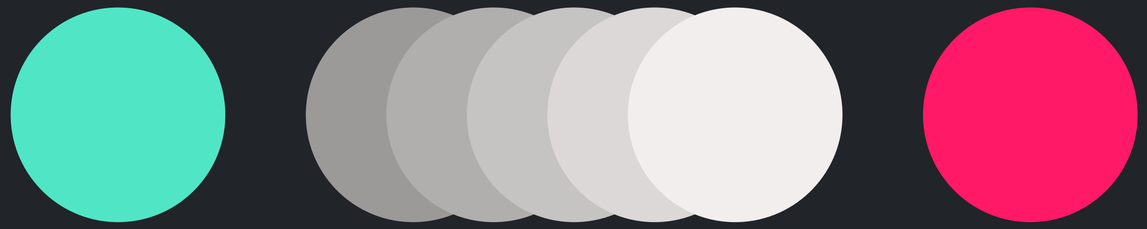
Interaction Examples

Design System

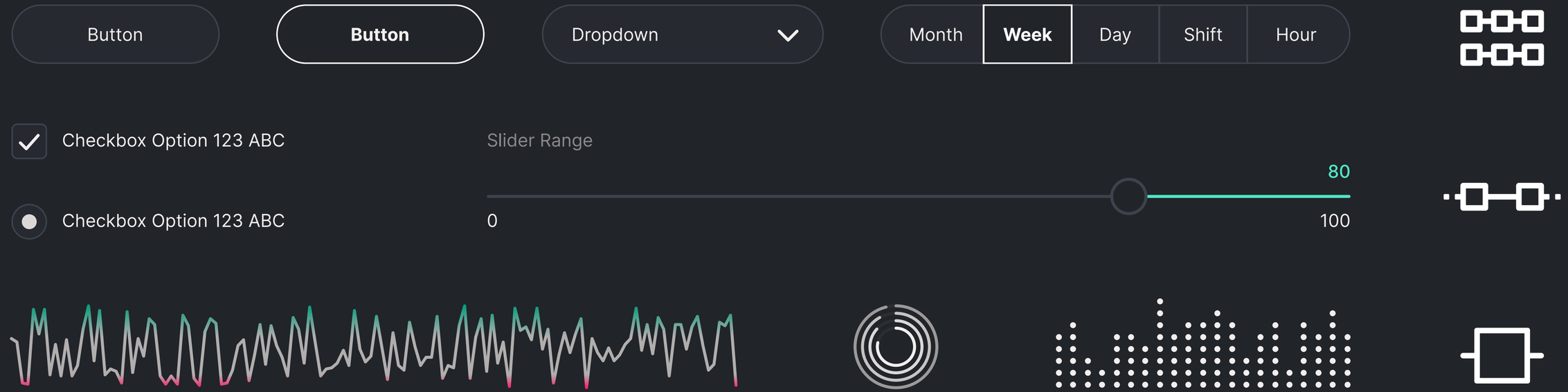
Principles

– Esthetic and reduced graphic style, focused on the visual information
– Simple structures and clear contrasts
– Consistent color concept for quality structuring of all key-performance-indicators
– Functional and self-explanatory controls
– Individually selected, easy-to-read trends and infographics
– High quality overall appearance

Color Code



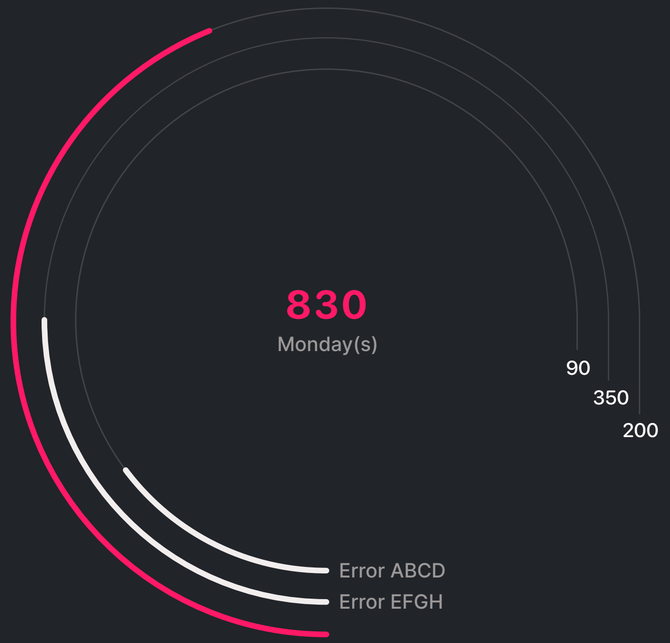
Controls, Icons, Graphic style

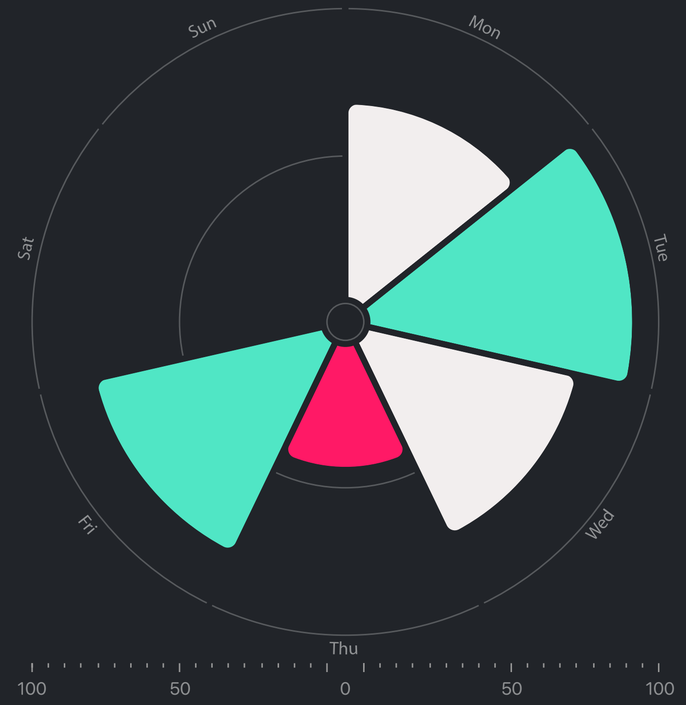


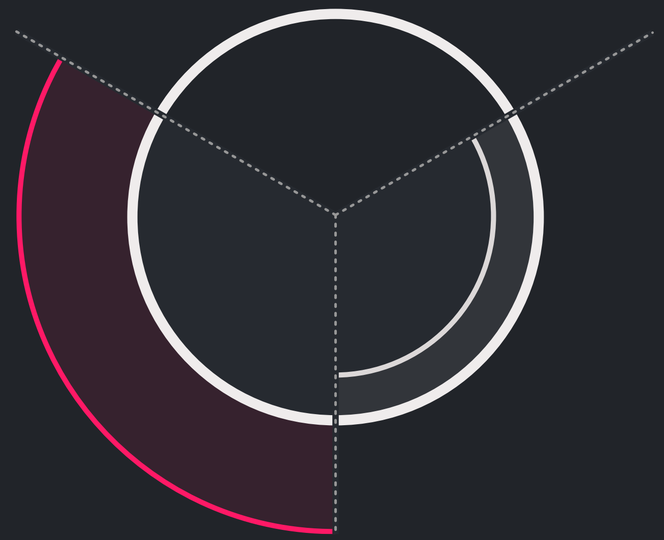
Infographics

Principles

– Numerous visualization types, individually selected for each analysis topic
– Display appearance optimized for required information content
– Various levels of detail, depending on application
– Flexible display sizes and responsive adaptation to available screen resolution







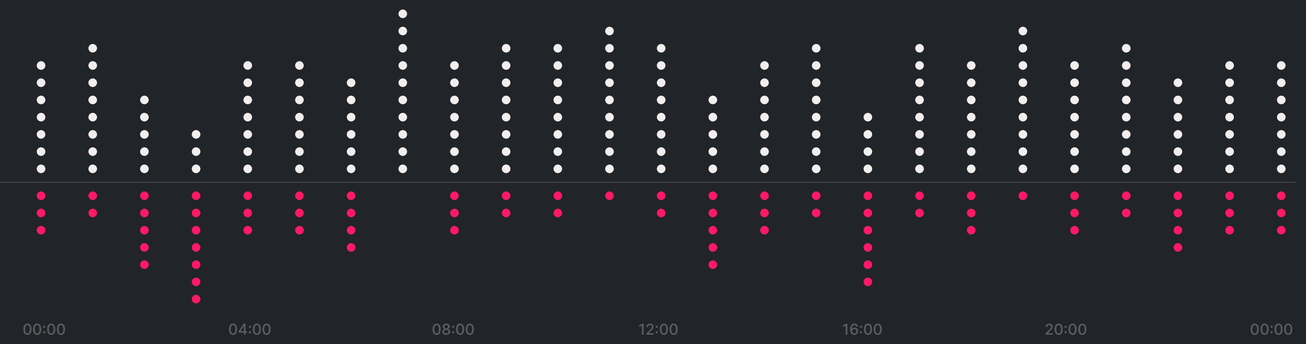
Infographics example for failures vs. weekdays,
Overall Equipment Effectiveness and average waiting time

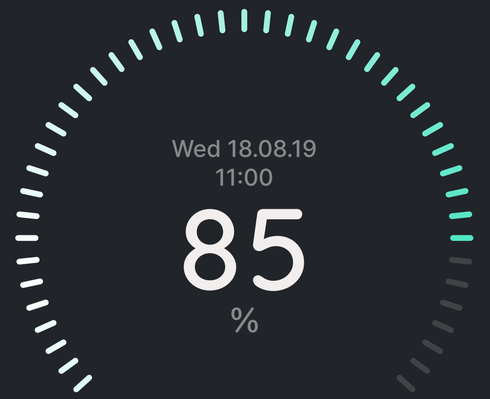
Infographics

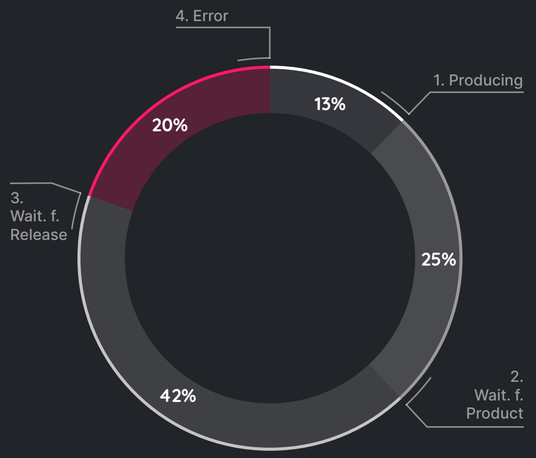
Principles

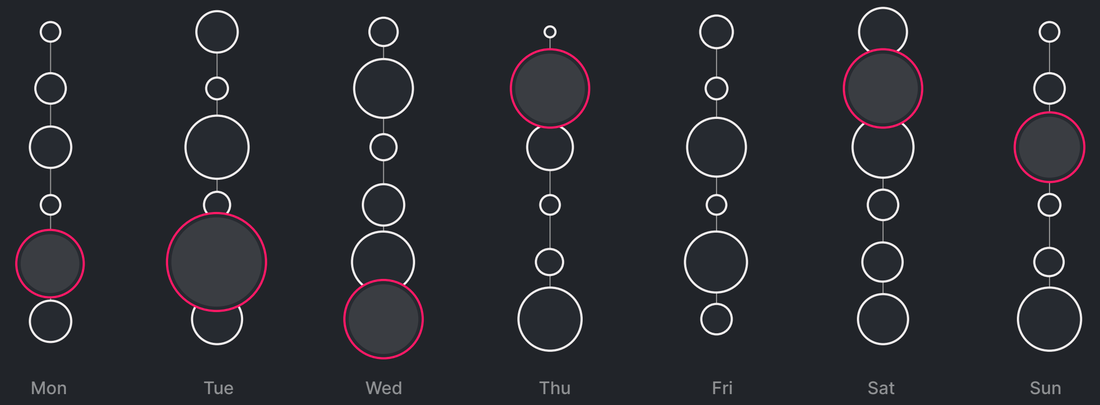
– Consistent graphic style with simple and clear geometric shapes
– Characteristics are enhanced by establishing animations
– Limits and visual highlights can be configured by the user

73.3%
26.7%







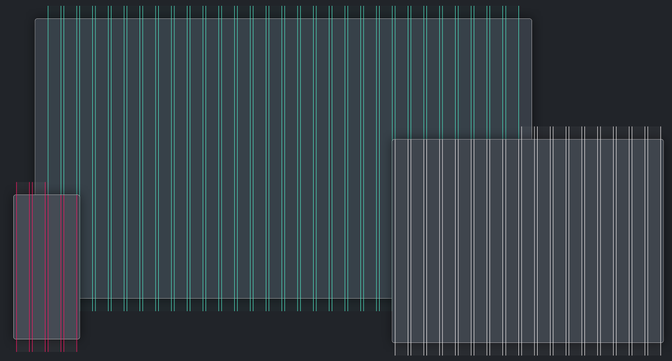


Infographics example for Product Counter, Performance,
Machine State Recorder and Failures vs. Weekdays

Responsive Design

Principles

– Developed with the latest web technology
– Designed for multiple device types and panel sizes
– Applications: master control displays, PC workstations through to tablets and smartphones
– Mouse as well as touch-optimized operation
– Numerous multi-touch features
– Scalable, responsive behavior of framework, widgets and infographics
– Grid-based application automatically adapts to device types and screen resolution



Multi-device column grid system

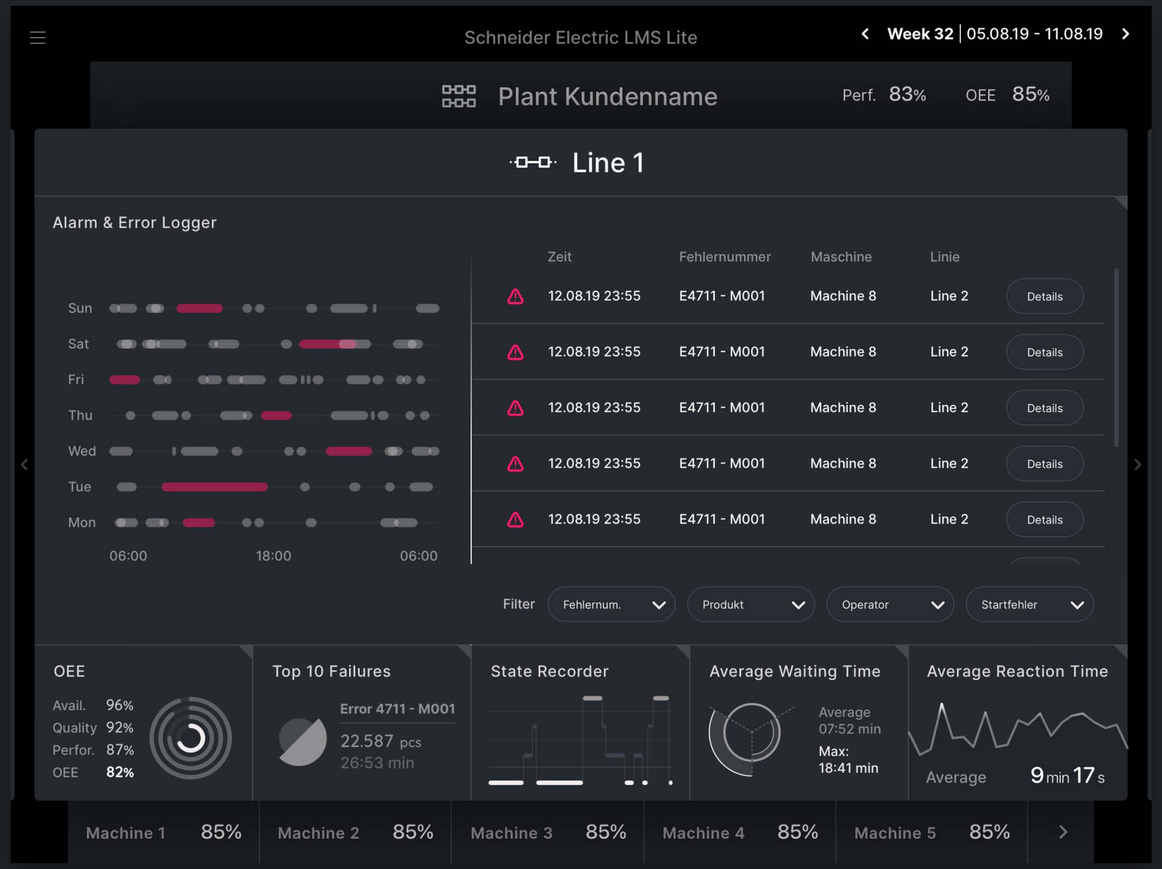
Device overview

Features

Additional Functions

– Integrated contextual help
– User and access management
– Light theme for printing of reports
– Screensaver with characteristic OEE visualization

– Customizable client branding, plant structure and dashboard configuration
– Entry point for paperless office approach
– Expandable widget library
– Admin tools for system setup and commissioning



Overall error management and evaluation

Advanced widget customization

Structural overview of complete plants and lines

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