Systore

Our propetary software

SYSTEM Logistics

A MEMBER OF THE KRONES GROUP

Systore

Warehouse Management and **Control System (WMS + WCS).**

Entirely **designed and developed by System Logistics.**

Flexible because is based on a **modular structure**, easy to implement, configure and upgrade.

Easily interfaced with existing WMS, ERP systems and other IT processes.

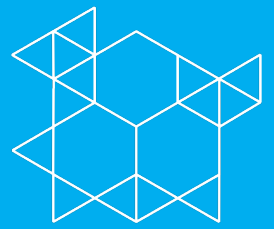
Web Based interface, consistent on mobile or handheld devices.

FOOD

BEVERAGE

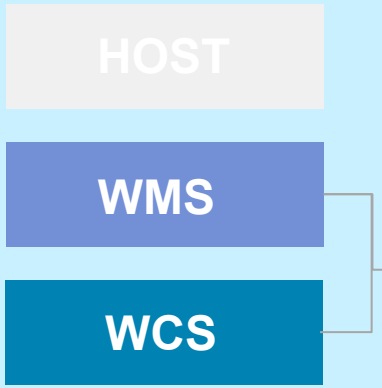
COLD & FROZEN

GROCERY



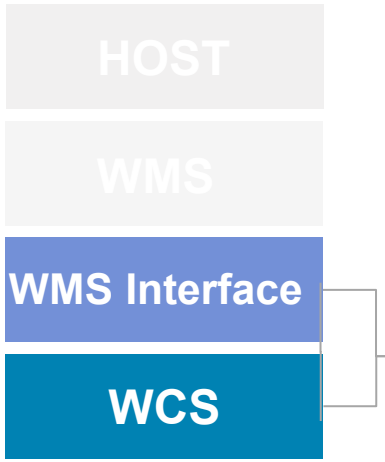
ARCHITECTURE

Systore WMS-WCS Architecture Options



WMS and WCS by SYSTORE

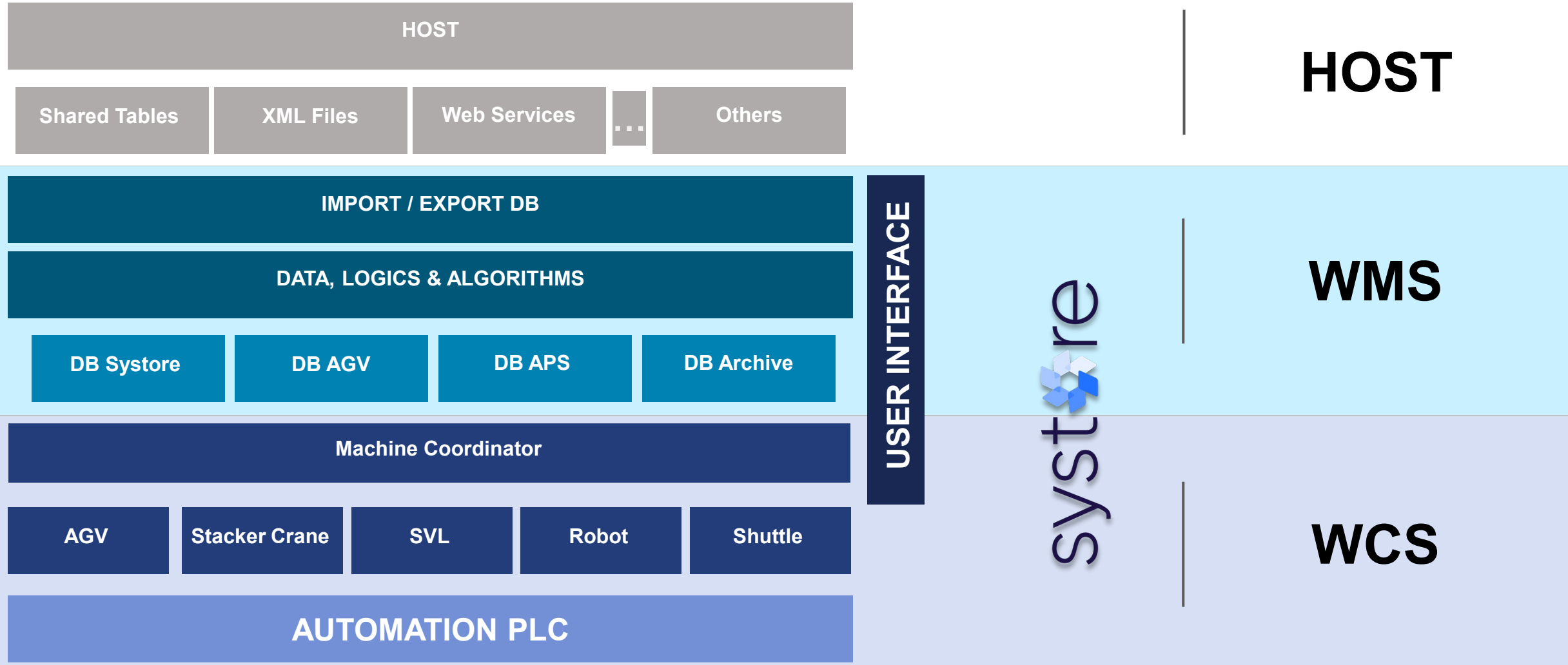
- The customer Host acts as an Order Manager, issuing the inbound/outbound orders
- Systore is responsible for storage decisions
- Warehouse is a “black box”: Host knows “what” is stored, but not “where”
- Systore is responsible for all optimizations and performances

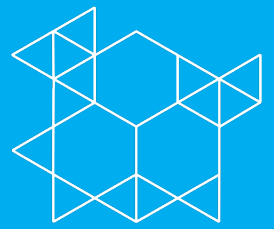


WCS by SYSTORE - WMS by Customer

- The customer WMS is responsible for storage strategies, general optimizations and performances
- Systore is responsible for machine optimizations and performances

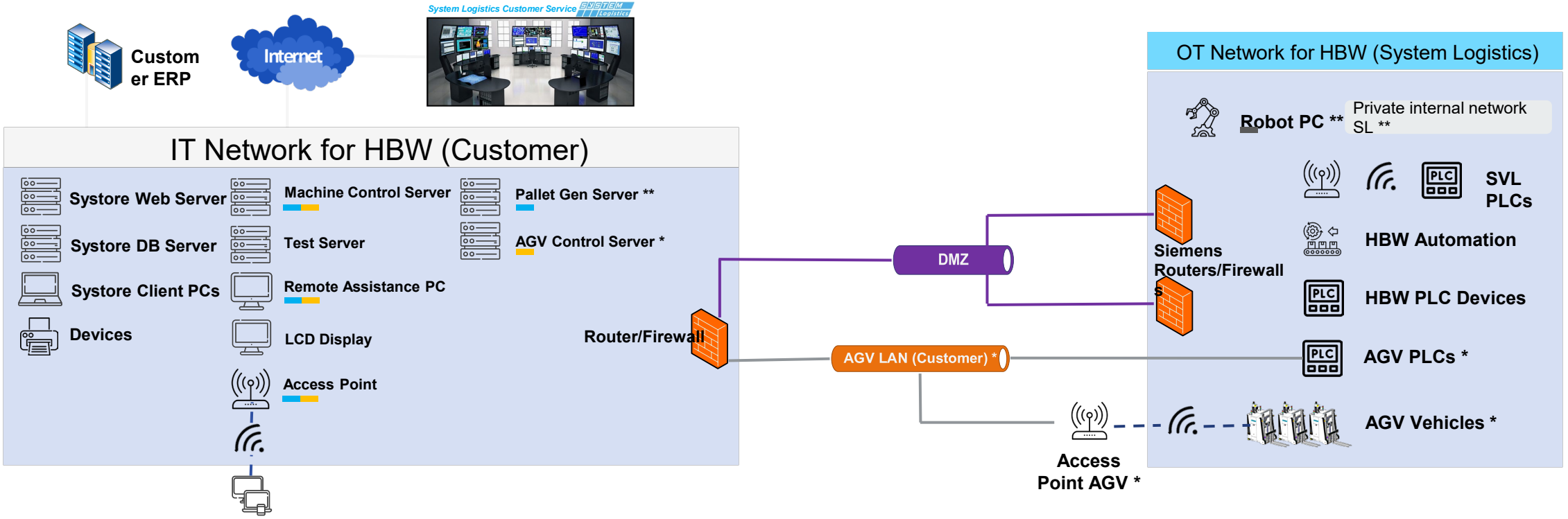
Systore WMS and WCS Architecture





NETWORK

Systore Network (Detailed Layout)



During the installation phase, the SL technician's laptops and tablets must reach the OT network and AGV (if present) devices

Legend

- Connection with OT network required
- Connection with AGV network required
- Connection with IT network required

** Only if the system foresees the presence of AGV vehicles*
*** Only if the system foresees the presence of an APS device*

Systore Technologies

ENVIRONMENT & OS

Microsoft Windows Server 2022
Standard Edition, 64 bit
(Database server)

Microsoft Windows Server 2022
Standard Edition, 64 bit
(Control machine server)

Microsoft Windows 11
(all other PCs)

TOOLS & LANGUAGES

Microsoft Visual C#

Microsoft Visual Studio 2019

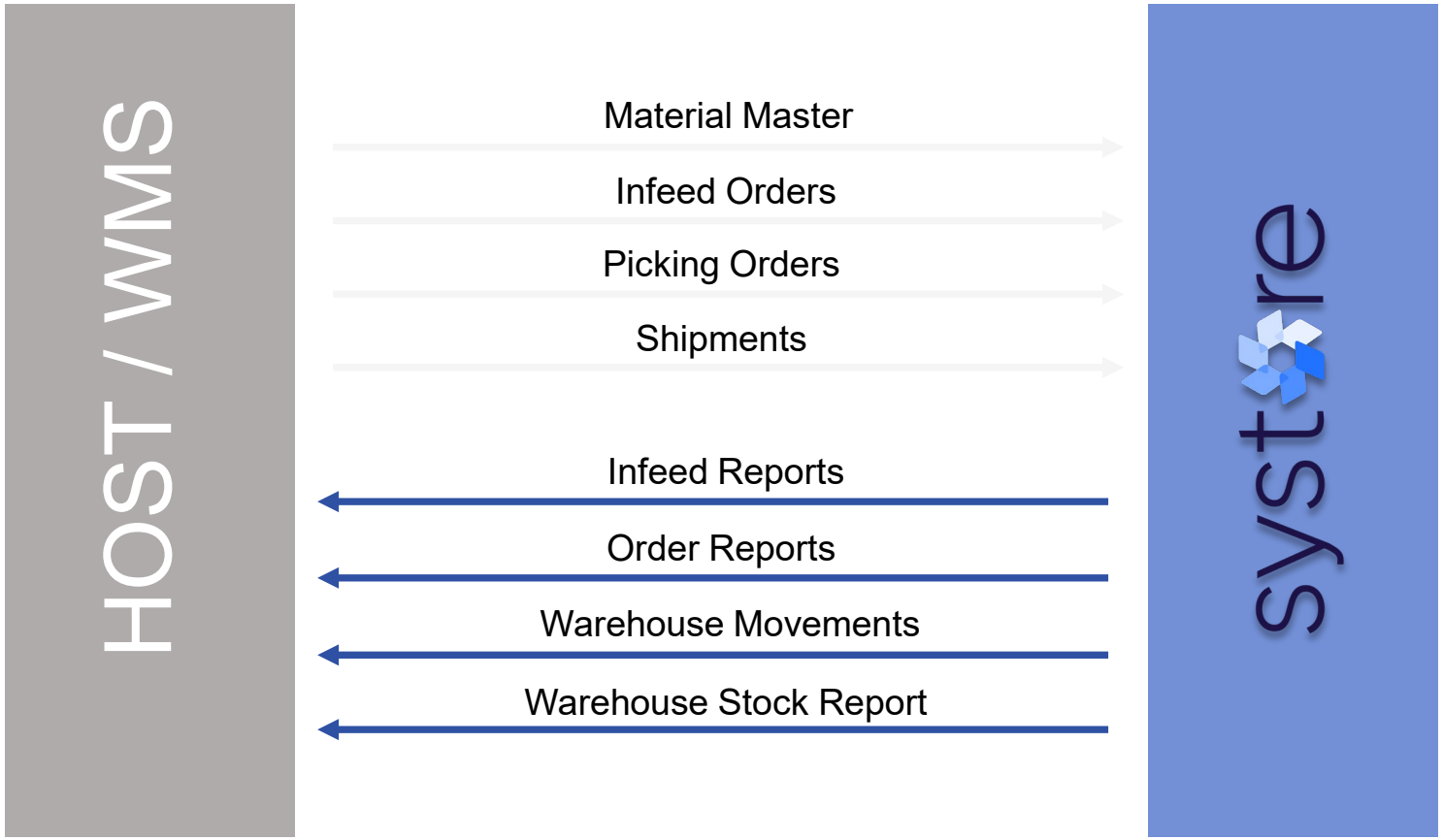
Microsoft SQL Server 2022

Microsoft ASP.net

The programming software for the PLC applications is determined by the PLC's manufacturer and for System Logistics it's Siemens.

WMS
ERP CONNECTION

Systore Standard Data Flows



Systore ERP (or WMS) Connection

Different integration technologies available
(Shared Tables, Web Services , XML, RFC, IDOC, Text Files …)

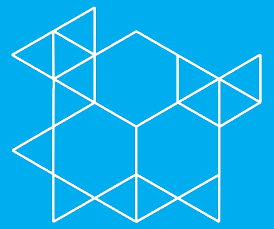
Customized set of Data Flows

Each Data Flow is a unidirectional flow

Customized information for each Data Flow

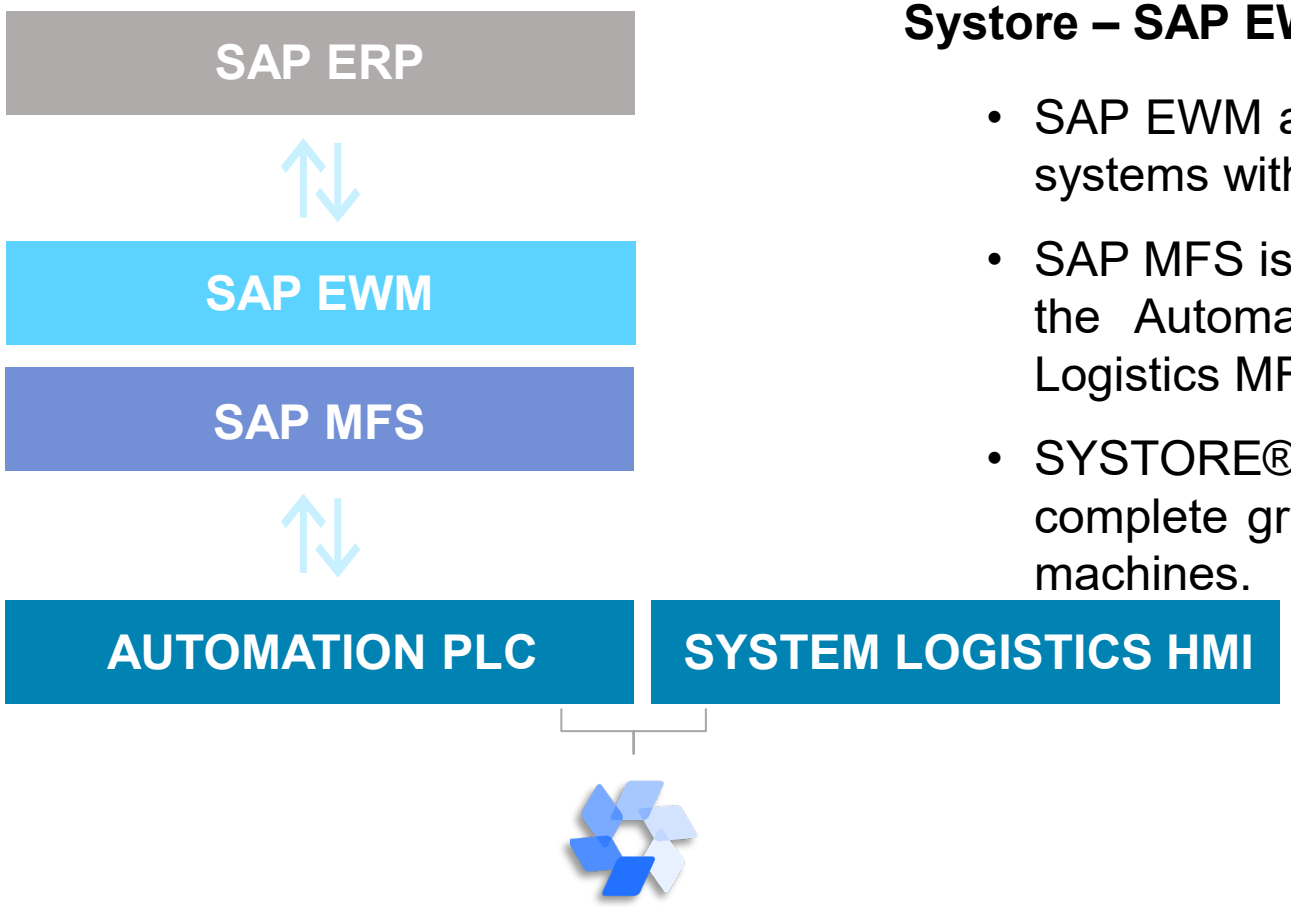
LOG Table for data-exchange events

DATA EXCHANGE FEATURES



SAP EWM MFS

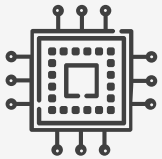
Systore - SAP EWM MFS



Systore – SAP EWM

- SAP EWM and Automation PLC are two independent systems with their own processes and logics.
- SAP MFS is the interface between the SAP EWM and the Automation PLC, which replaces the System Logistics MFS.
- SYSTORE® provides PLC Automation and a complete graphical user interface to interact with the machines.

Systore - SAP EWM MFS



SAP EWM

- Storage bin accurate inventory management
- Storage bin determination for incoming goods
- Stock retrieval for outgoing goods
- Stock transfers
- Physical inventory
- Management of orders, picking, refilling, shipping … generating “missions” for SYSTORE®

SAP MFS

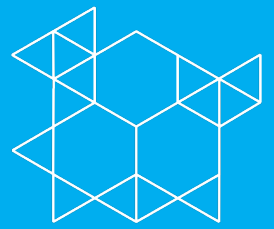
MFS is out-of-the-box feature in SAP EWM to control the movement of fully automated Warehouse.

MFS supports automation by the feature mentioned below.

- MFS enables a connection to an automatic warehouse to SAP EWM without the need for an additional warehouse control unit.
- SAP EWM communicates directly with the control level.
- MFS can be configured in such a way that warehouse tasks are subdivided into smaller tasks.

SYSTORE

- Management of all the machines executing the “missions” sent by EWM
- Machines missions' execution
- Graphical interface (HMI)
- Diagnostics
- Machines’ statistical data



WMS FUNCTIONALITIES

Systore Functionalities: WMS

Infeed procedures and storage criteria

Outfeed orders management, immediate requests and algorithm for material selection

General Functionalities like inventory, user roles, diagnostics and reports

Data Exchange with Host with different integration technologies available

Systore Functionalities: Infeed

INFEED ORIGINS

- Direct connection to external line
- Infeed from Forklift Bay
- Infeed from AGV Bay
- Product refilling

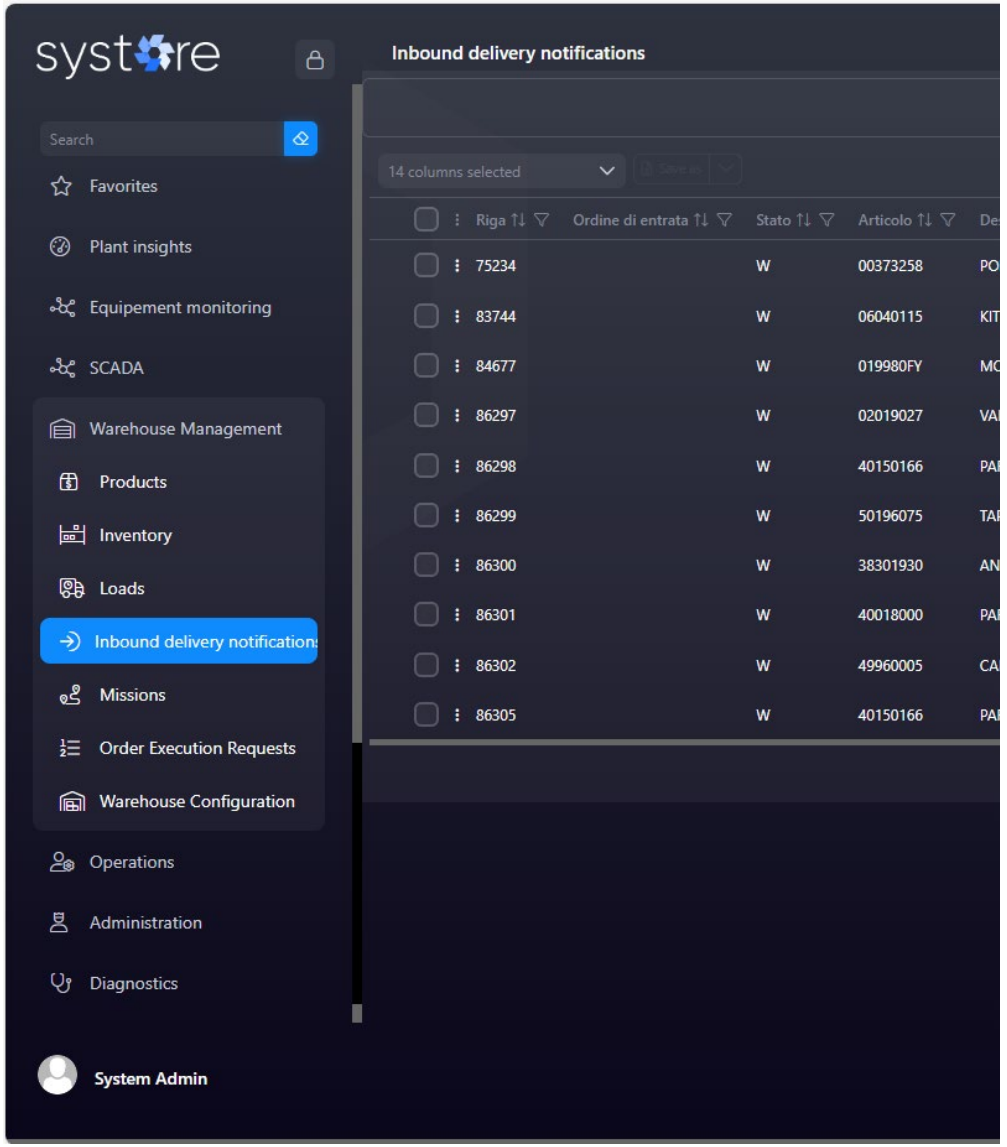
INFEED MODALITIES

- Manual barcode reader
- Automatic barcode reader
- Infeed Orders
- Manual data input

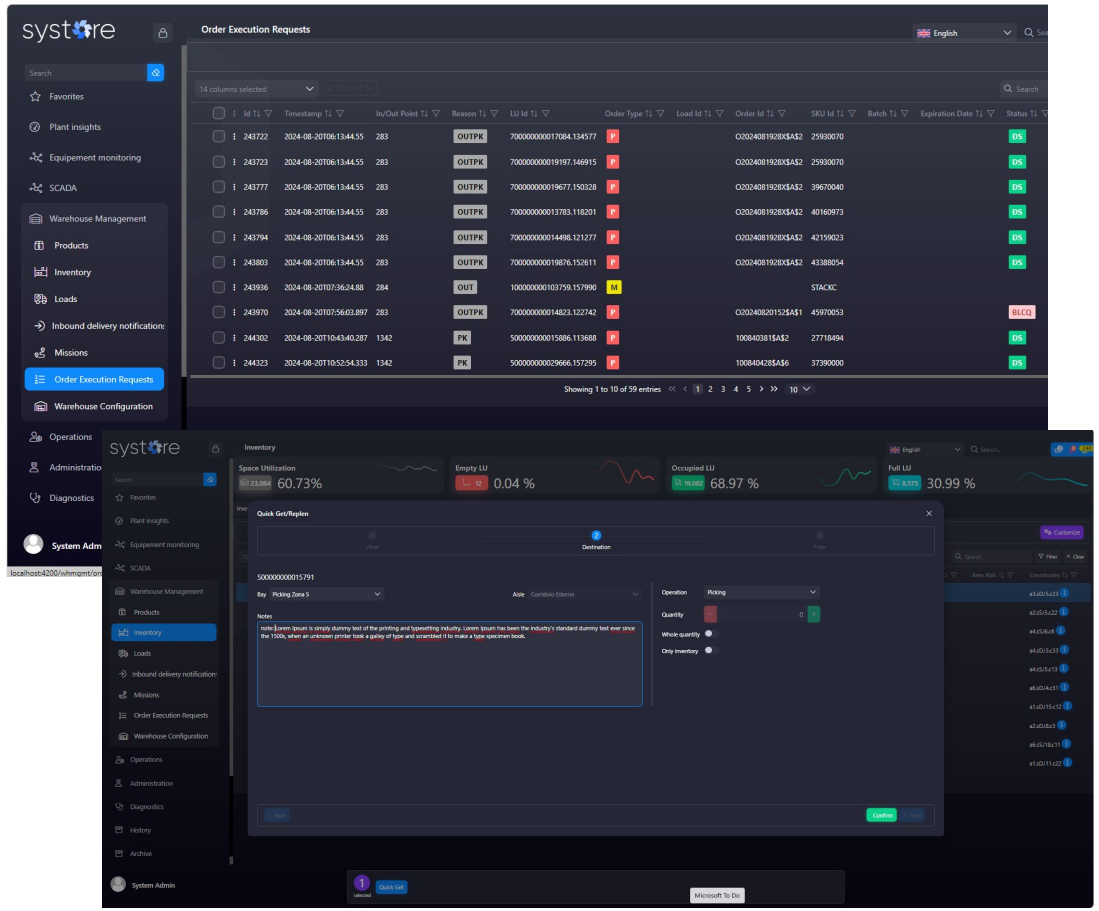
INFEED ALGORITHM

Store in rules

- Availability of free cells in the warehouse
- Availability of cells already containing the same SKU (same batch/lot)
- Balance of the same SKU in the aisles (AGV, FRS, Stacker Crane, Manual)
- Workload of the machines



Systore Functionalities: Outfeed



IMMEDIATE REQUEST

These are typically done directly on SYSTORE® dialog on the PC of the picking bay, to fit urgent needs or unplanned and unplannable by Host

- Immediate by SKU
- Immediate by LU

OUTFEED ORDERS

Orders are the mechanism by which Host controls the retrieval of products with a common destination

Orders are the mechanism by which Host controls the retrieval of products with a common destination

OUTFEED ALGORITHM

Store out rules

- **FIFO**: SYSTORE® selects the oldest LU in term of manufacturing date time
- **LIFO**: SYSTORE® selects the newest LU in term of manufacturing date time
- **FEFO**: SYSTORE® selects the oldest LU in term of expiry date time
- **VOLUME**: SYSTORE® selects the emptiest LU (if present in stock)
- **LU positions**: In case of multi depth cells, it is selected primarily the LU in front

Systore Functionalities: Shipment

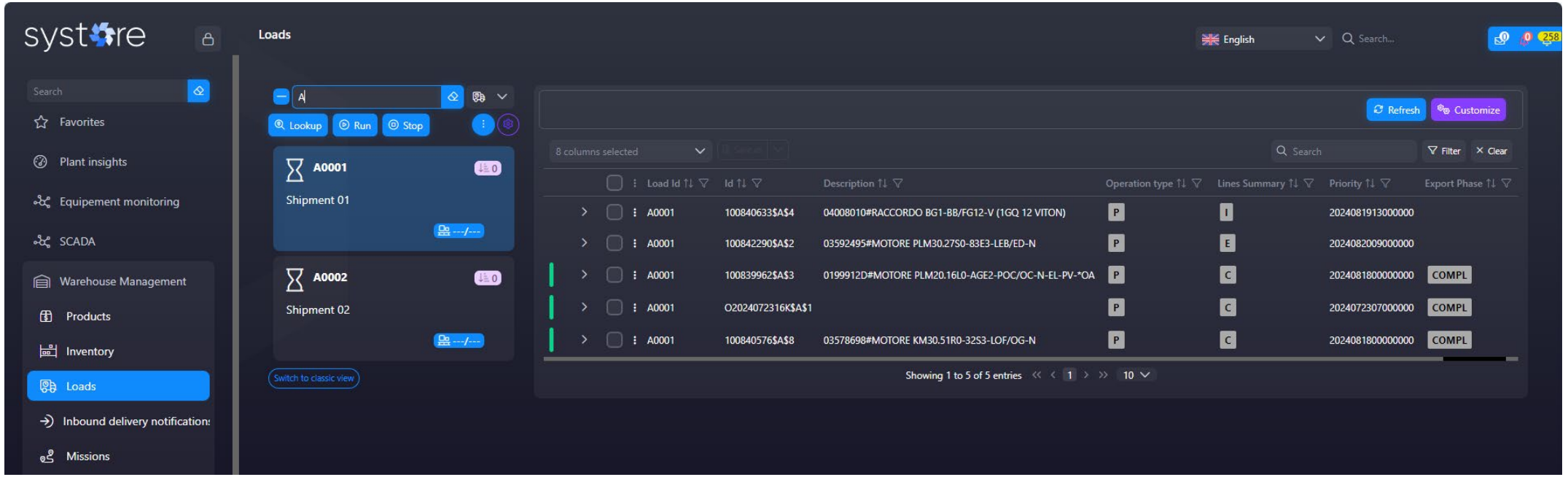
SHIPMENT

SYSTORE® considers a **shipment** to be a logical grouping of multiple outfeed orders which leave the plant on the same truck.

The execution of a shipment consists in moving towards a shipment bays all the shipping units belonging to current orders and shipment.

SYSTORE® allows to:

- Create a new shipment
- Set the priority for orders and LU
- Launch a shipment
- Release LU from orders and shipment



Systore Traceability and Maintenance

MAINTENANCE

Track a maintenance activity with «Trip» button, saving all data

Export data

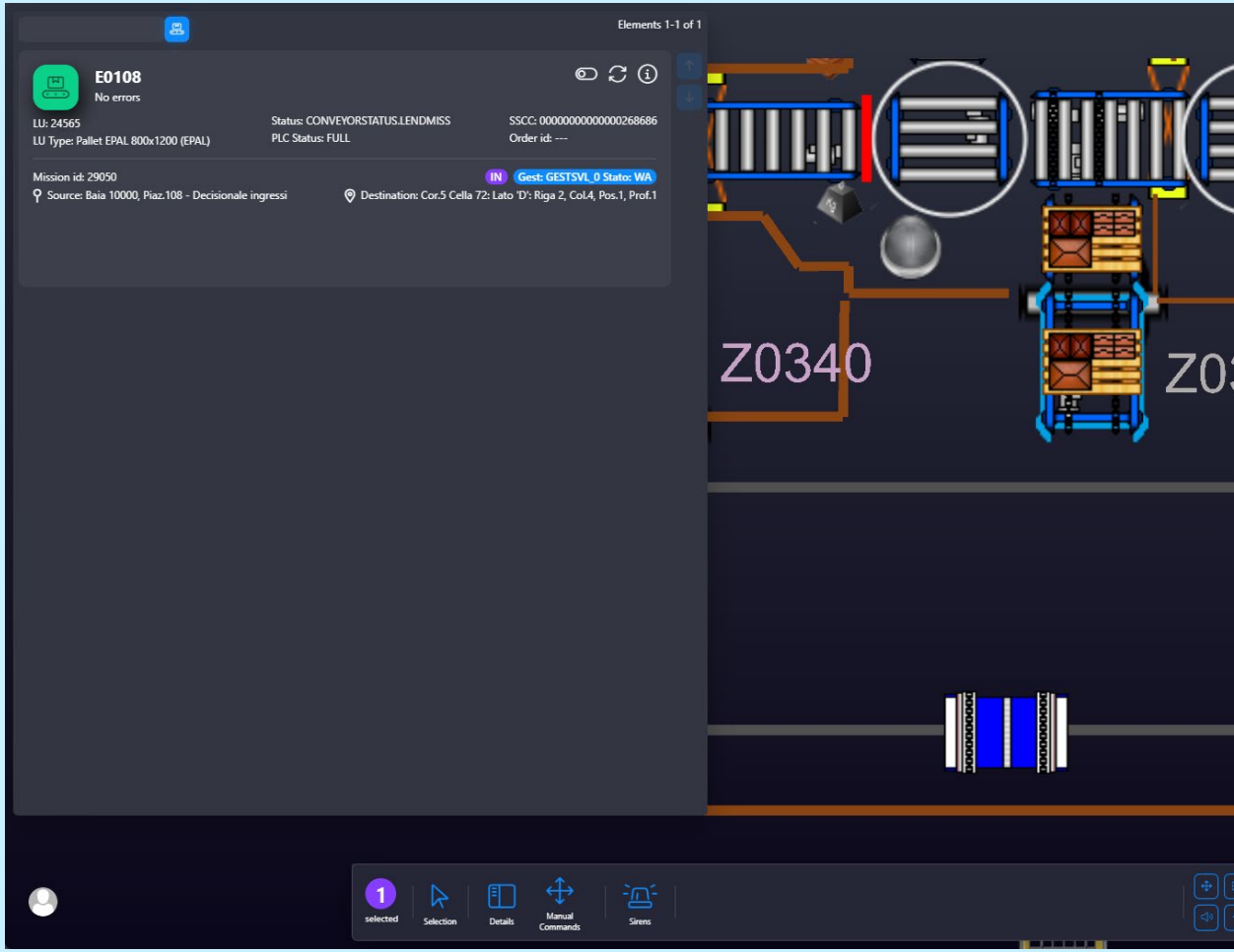
Observe in the «Historical» section the Kms/Cycles elapsed from the last maintenance activity tracked («Trip»)

Observe Km/Cycles elapsed from last maintenance in «RunTime» Section

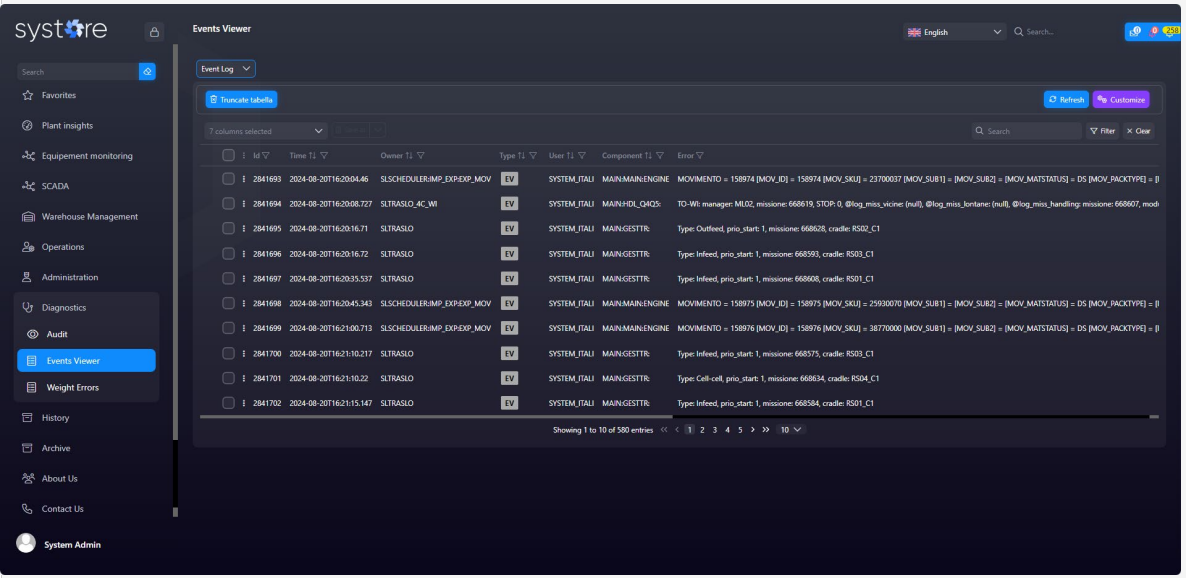
TRACEABILITY

SYSTORE® holds a robust and safe traceability of all the material moved and stocked with the automatic warehouse letting to search and identify the product by main characteristics:

- LU type
- SSCC or Pallet ID
- SKU
- Batch/Lot
- Manufacturing date
- Expiry date
- Storage positions
- Material status (blocked, quarantine, damaged, available…)



Systore Diagnostic



WMS DIAGNOSTIC

- Corridors situation
- Loading unit statistics
- Corridors statistics
- Mission Log
- Order Log
- Order History
- Level 2 Log
- Event Log
- Work Log
- Audit Log

WCS DIAGNOSTIC

- Availability calculation and reporting
- Errors log
- Statistical data for each element
- Electrical diagnostic (ASI)
- PLC communication

Systore Visualization System

PLANT LAYOUT

SYSTORE® includes a visualization system fully integrated and advanced.

It allows the integration and the visualization of 3PE machines

Manual command with exclusive access to each zone.

MACHINE CONTROL

Most of the plant can be controlled using Tablet PC.

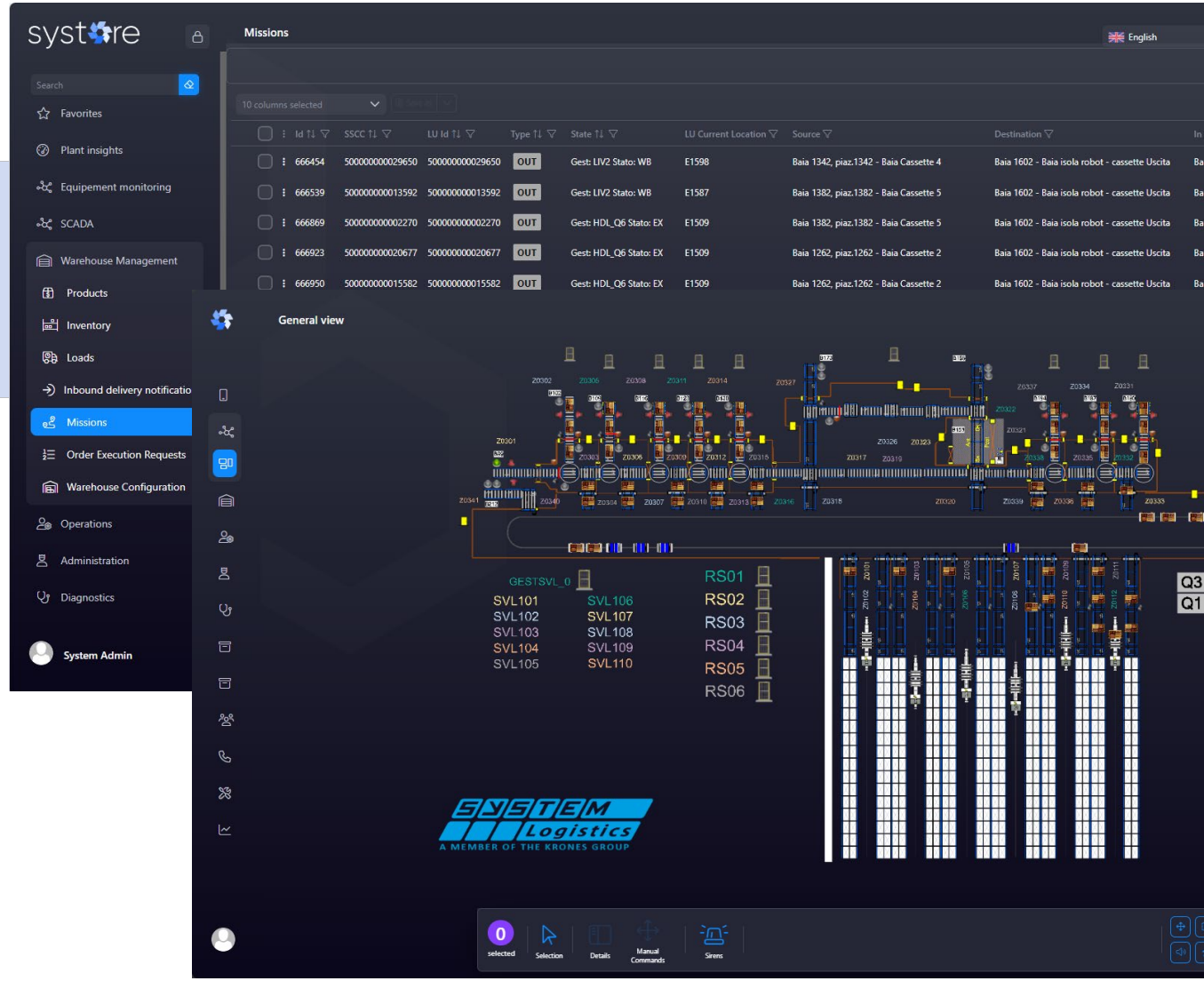
Automatic and manual commands; «Stop» and «Power On» buttons to start or stop the machines.

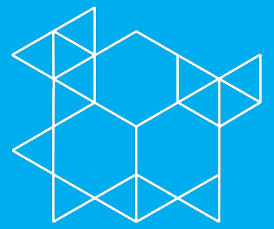
User and Roles configurable structure to allow specific commands for specific user on specific machine.

MISSION MONITORING

SYSTORE® allows to view and filter every mission, in progress or completed, throughout the whole plant.

Each Load Unit being handled is always associated with a mission, that contains various data related to the transfer movement





AGV

AGV

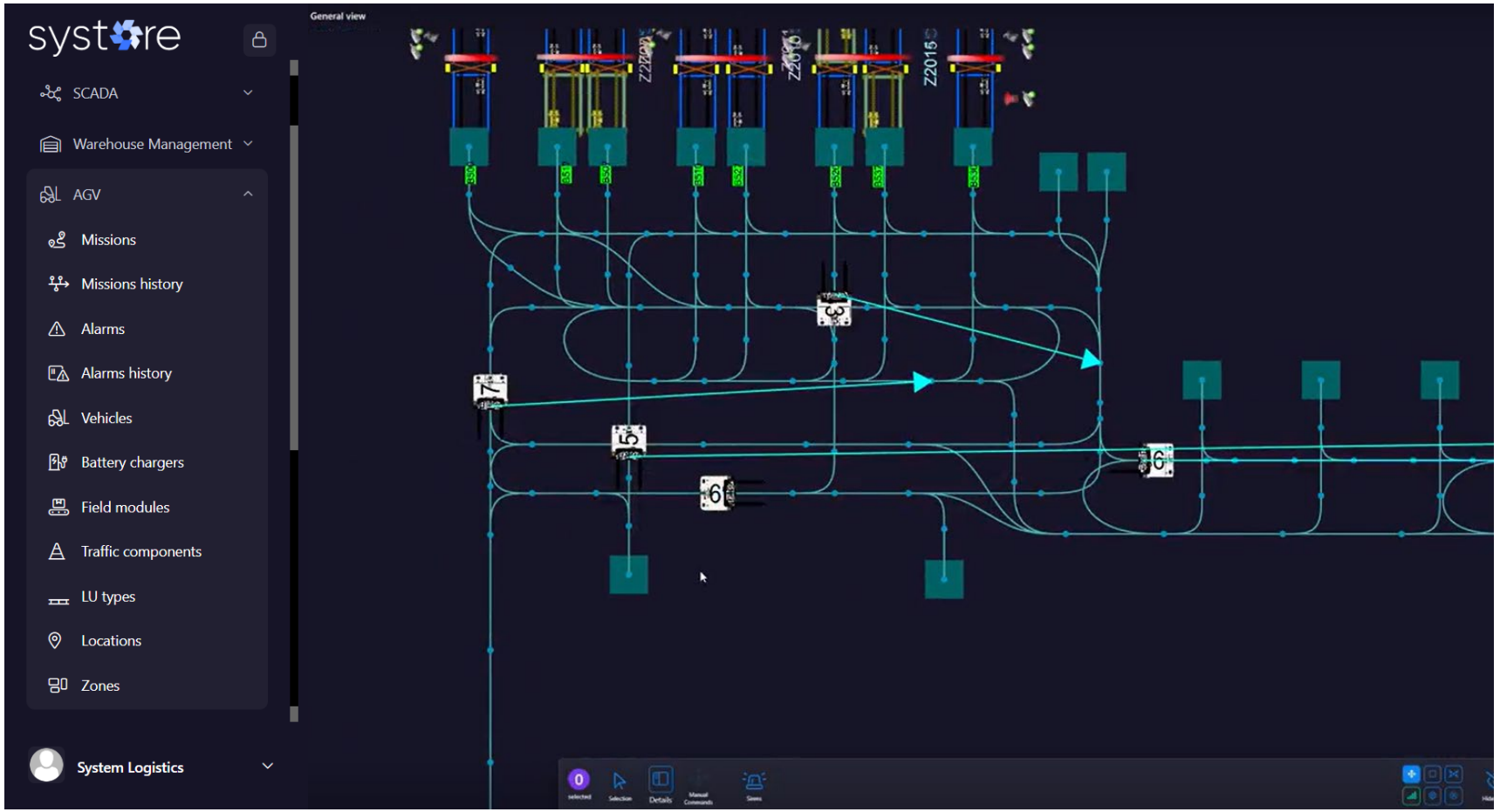
- AGV Live Layout
- Mission Manager
- Traffic Manager
- Field Collector

AGV LIVE LAYOUT

AGV LIVE LAYOUT

All AGV functionalities can be accessed through the Systore integrated interface:

- Automatic and Manual mode
- Parameters configuration
- AGV routing and their status on real time (operations, alarms…)
- AGV machinery diagnostics (Battery Charger, lines…)
- Active and Historical information
- Alarms triggered by the AGVs during their operativity



Mission Manager, Traffic Manager & Field Collector

MISSION MANAGER

The Mission Manager is the main component of Systore AGV, capable to:

- Generate transport missions for AGVs
- Coordinate AGV movement (pick up, drop off…)
- Dynamically distribute vehicles workload and tasks
- Diagnose the automation machinery related to AGV system
- Set the automatic/manual mode

The Mission Manager can be integrated with Systore WMS or directly to external ERP systems (TCP/IP protocol).

TRAFFIC MANAGER

The Traffic Manager is a component of SYSTORE® AGV used to route and coordinate the AGV vehicles.

This module is capable to calculate the best route for each AGV, according to their position and availability (route optimization).

The Traffic Manager also analyzes the warehouse layout and paths to prevent deadlock situations.

Traffic Manager exchanges messages with each AGV vehicle in real time to track its position and status (battery charge, vehicle operations…).

FIELD COLLECTOR

The Field Collector is a SYSTORE® module capable to read/write data directly on automation PLC:

- AGV / line interface (pallet ready, line full, SSCC code…)
- Automatic doors management
- Traffic lights
- Fire alarms
- …

The Field Collector can be easily connected to the automation PLC, and it natively supports different PLC protocols (Omron, Siemens, Allen-Bradley…).

Integration with third party machineries

HANDSHAKE

Low-level interface (handshake) between the machines and the AGV vehicles guarantees a correct and safe loading and unloading operation.

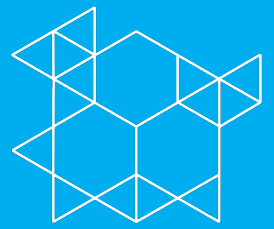
This is done by a dual pair of TXv/RXv, TXm/RXv transmitter/receiver photocells.

PLC INTERFACE (OPC UA)

PLC data exchange is managed by the **Field Collector**, which relies on a data exchange via PLC using the **OPC UA protocol** (Siemens, Rockwell) for the data transfer and tracking of the Loading Unit, like:

- unique identifier (SSCC/Pallet ID)
- pallet type
- product, quantity, batch, etc.

This data can be supplied directly from the line via PLC protocol or come partly from the line and partly from the customer's ERP (line must provide pallet type and unique identifier).



Systore Pocket

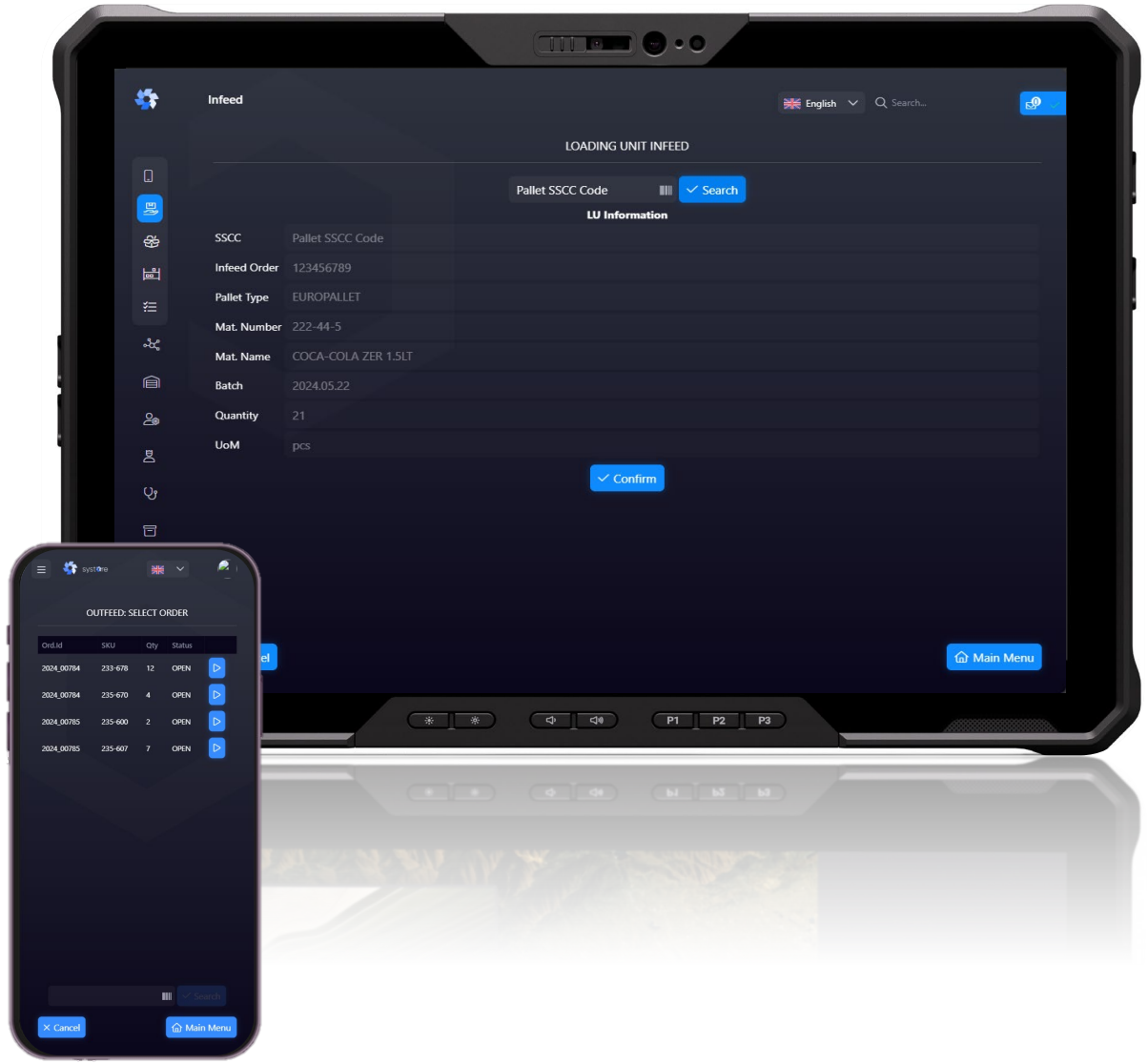
Systore Pocket

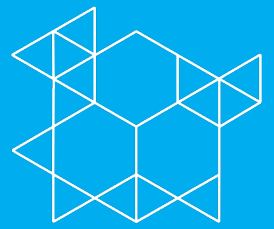
SYSTORE POCKET

SYSTORE® Pocket is a component of SYSTORE® designed for portable devices connected via Wi-Fi.

Created with a simple, intuitive, UI for both vertical and horizontal screens, it supports operators in different manual activities:

- Barcode reading
- Goods acceptance
- Warehouse Infeed
- Picking
- Inventory
- Truck loading
- …





Systore WMS optionals

Systore WMS Optionals

SYSTORE QA

Quality Assurance environment is an instance, functionally equivalent to the production environment, that can be used to support the quality and strength of software changes

QA environment allows to:

- test and validate new release on ERP
- test SW changes in SYSTORE® Level 2
- test changes in the interaction SYSTORE® - ERP/HOST
- increase the security and the trust in new procedures
- provide the best support for additional training

ADVANCED MAINTENANCE

With **Maintextra** functionality is also possible:

- Define maintenance intervals
- Have access to maintenance historical data done on each module.
- Add, modify or delete customized maintenance activities

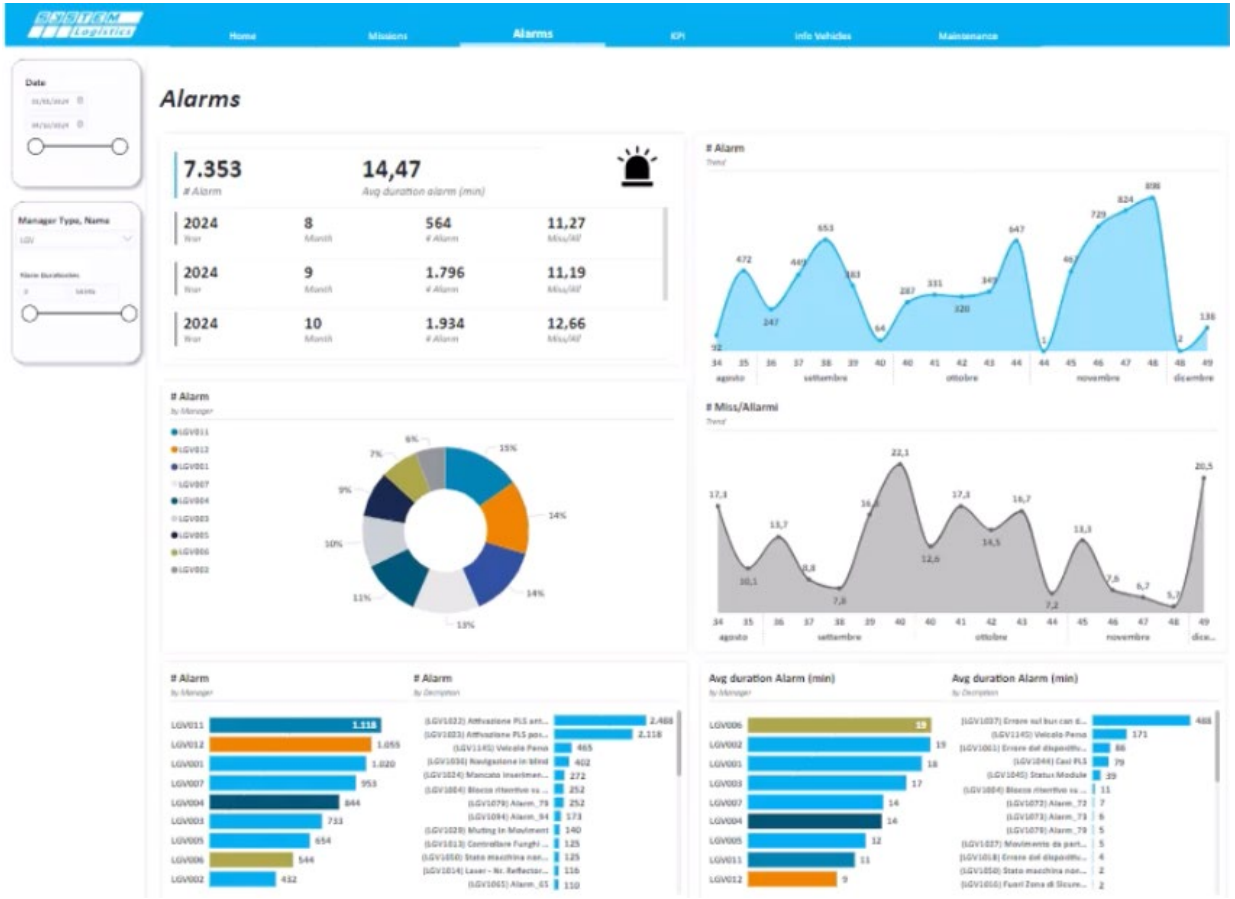
Systore WMS Optionals

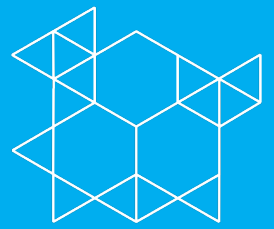
BUSINESS INTELLGENCE

Systore OneView: Measure, load and plot

OneView allows to:

- **Effective Communication**: data can be shared with all stakeholders, promoting a common understanding of plant performance
- **Efficient Analysis**: dashboards provide a comprehensive view of plant performance
- **In-depth Analysis**: dashboards can be used to analyze historical data to identify trends and patterns
- **Data-driven Decisions**: dashboards provide operators with the information they need to make informed data-driven decisions





Cyber security

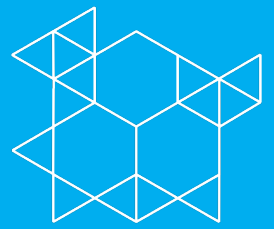
Cyber security

CYBER SECURITY

- ✓ IEC 62443
  SL is moving in this direction to reach the security levels appropriate to the proposed solution and to the operating environment based on SL assessment.
- ✓ ISO27001
  Certification from January 2026 and already planned activities throughout 2025 to comply with the NIS2 directive

Penetration tests and Audits foreseen during compliance with the security levels of 62443 appropriate to the proposed solution and the operational context based on SL's evaluation.

The roadmap will cover next two years in line with REGULATION (EU) 2024/2847 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL.



OneView

Objectives

Efficient Analysis

Dashboards provide a comprehensive view of plant performance.

Data-driven Decisions

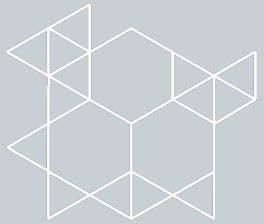
Dashboards provide operators with the information they need to make informed data-driven decisions.

Effective Communication

Data can be shared with all stakeholders, promoting a common understanding of plant performance.

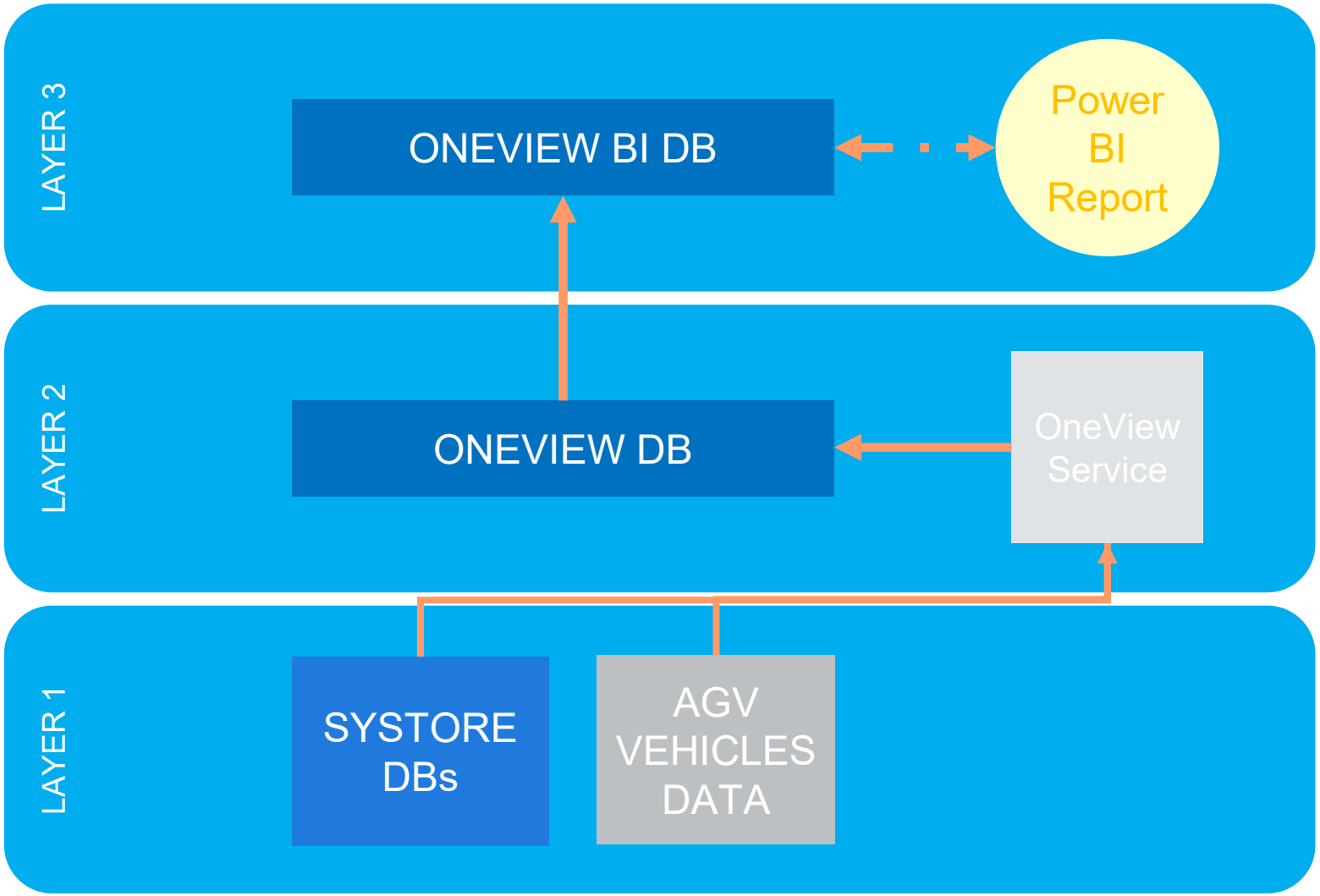
In-depth Analysis

Dashboards can be used to analyze historical data to identify trends and patterns.



IT Infrastructure

IT Infrastructure



Requirements

To ensure optimal performance and integration with industrial systems, the OneView platform requires a specific set of hardware and software components.

Hardware Requirements

- 8 vCPU
- 16 GB RAM
- 500 GB HDD
- It is suggested to have a dedicated server for OneView

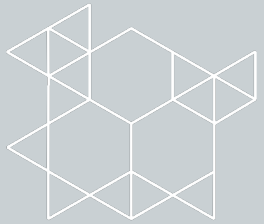
Software Requirements

- Operating System: Windows Server 2022
- Database: SQL Server 2022
- Framework: .NET 8

Connectivity and Integration

- Connection to Systore History database
- Access to AGV (Automated Guided Vehicles) *
- Access to AGV Supervisor database *
- Communication interface with vehicles *

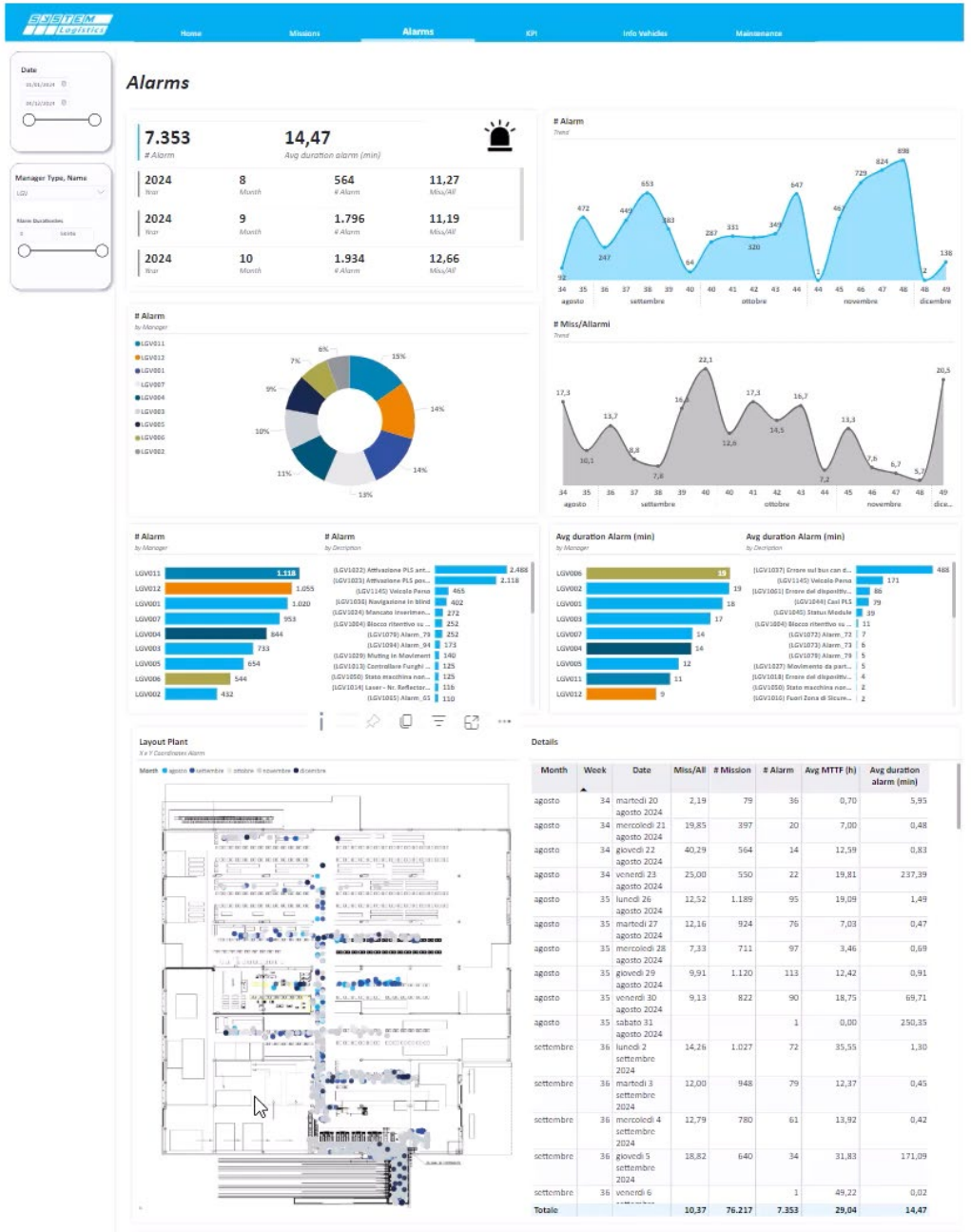
** Only if AGV Vehicles are present in the plant*



UI

Alarms

- Alarms indicate potential issues that require prompt attention to prevent downtime, accidents, and product damage.
- By analyzing alarm data through comprehensive data visualization techniques, we can gain valuable insights that drive proactive improvements.

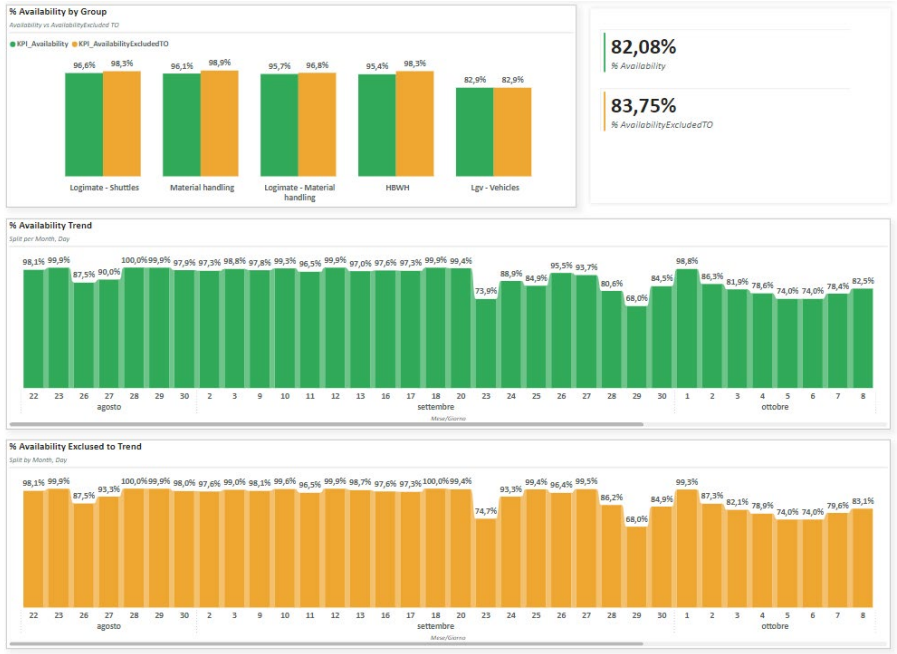


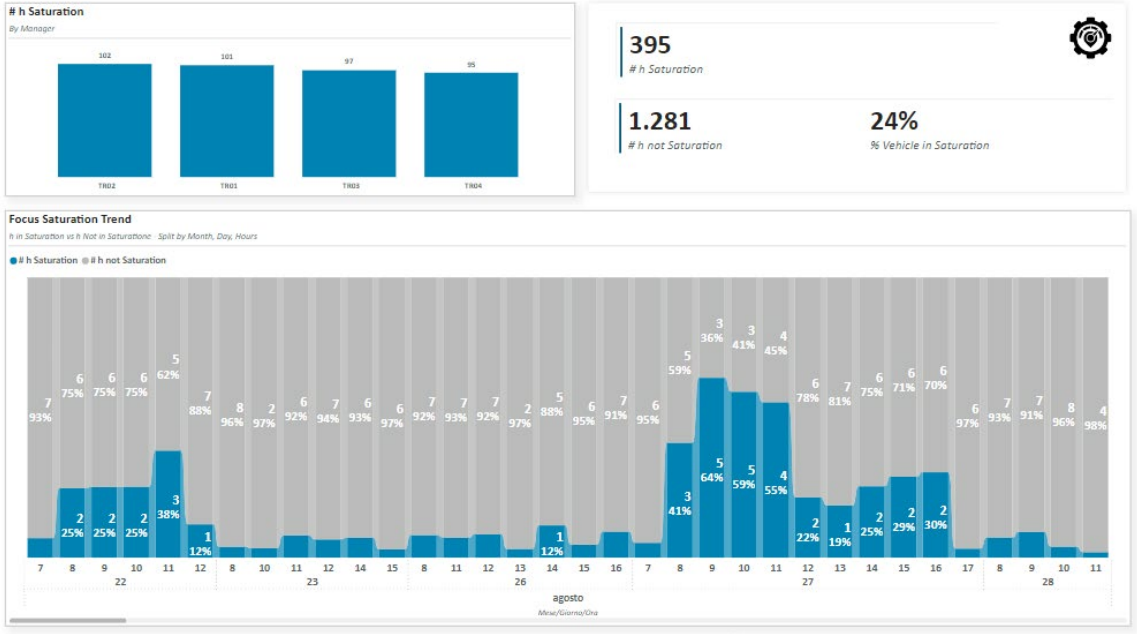
Missions

- Missions are tasks or cycles completed by a machine or production line, and act as a key performance indicator (KPI) reflecting the plant's efficiency and productivity.
- By analyzing mission’s data, we can identify areas for improvement, optimize resource allocation, and ultimately enhance overall plant performance.

Availability & Saturation

- The saturation provides valuable insights into the machines' performance, enabling technicians and managers to identify areas for improvement, optimize production schedules, and minimize downtime.

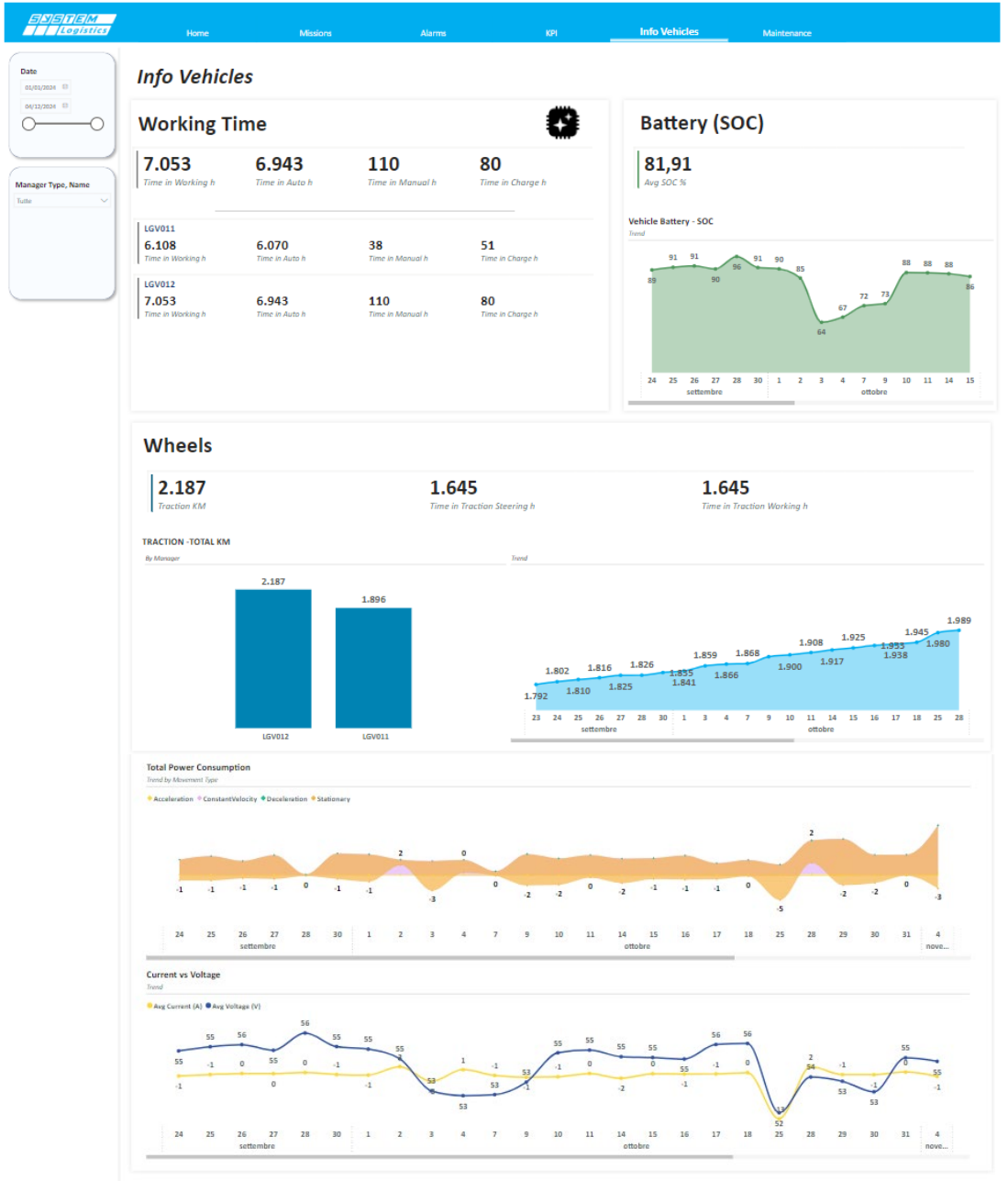


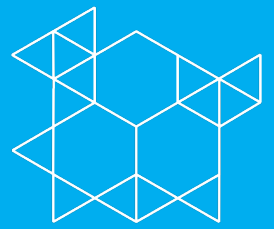


- The saturation provides valuable insights into the machines' performance, enabling technicians and managers to identify areas for improvement, optimize production schedules, and minimize downtime.

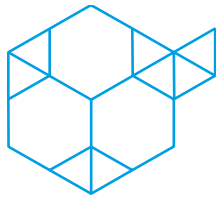
Info vehicle

- By collecting data on AGV operations, you can monitor their performance in real-time. This includes tracking metrics like working time, battery usage, and traction total km, for example.
- Data collected from agvs can be used to ensure that they are operating within the set parameters, maintaining the quality of operations.
- By leveraging data analytics, you can transform raw data into actionable insights, leading to more efficient, safe, and cost-effective agv operations.





THANKS FOR YOUR ATTENTION



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