

AWIMS.

warehouse management system

AUTOMHA

THE AUTOMHA SOFTWARE

SEAMLESSLY INTEGRATES
WITH THE COMPANY'S MANAGEMENT
SYSTEMS

CONTROL

AND **FLEXIBILITY**

FOR YOUR WAREHOUSE
AND YOUR BUSINESS

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1. What is a WMS?

WMS is the acronym for **Warehouse Management System**. This software automates the **management, control** and **optimisation** of **complex warehouse and distribution systems**.

The main goal of each WMS is the **management and optimisation of the warehouse internal systems**. Through **IT algorithms** aimed at managing both the basic logistic systems elements, such as the management of the quantity and stock, as well as the complex and integrated strategic management of production flows.

AWMS MANAGES:



WAREHOUSES:

- **MANUAL/RADIO FREQUENCY**
- **SEMI-AUTOMATED**
- **AUTOMATED**

AWMS is the Software Suite for the management of all types of warehouses. Manual with radio frequency, semi-automated using Autosat® and fully automated.



REMOTE OPERATIONS

Access all the functions of your warehouse, including remotely, with no limitations.



MOBILE DEVICES

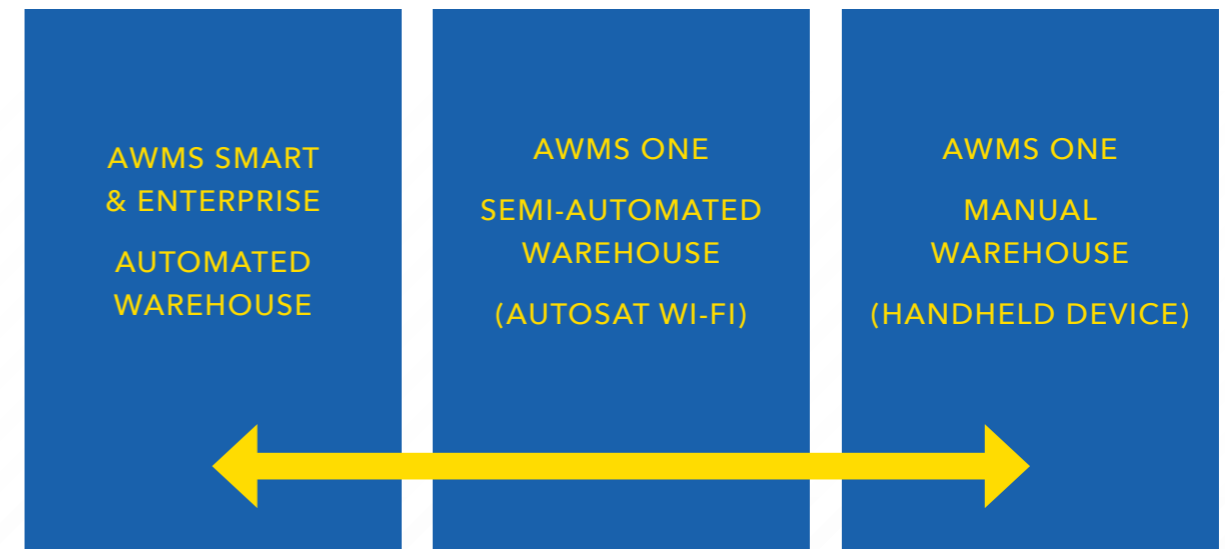
The world of your warehouse at your fingertips. Manage and analyse the main automation KPIs directly from your smartphone.

2. AWMS, Automha's WMS

AWMS is Automha's software suite, developed entirely in-house by the Automation & Software department, made up of highly qualified engineers in innovation and the automation of processes.

AWMS is a program based on a Microsoft IIS web server software; **each user can connect to the platform via a simple browser** (Chrome, Safari, etc.) using dedicated credentials. The entire system is based on a Microsoft Server solution updated to the most recent versions.

AWMS is a software suite for managing automated, semi-automated (Autosat Wi-Fi) and manual warehouses. All three sections are managed by AWMS's CORE services shared by the platform applications, so the basic WMS functions can be distributed and inherited by any warehouse.





AWMS consists of a core service that can **manage any type of automated warehouse**, with the associated handling logic and storage missions.

Semi-automated warehouses mean warehouses handled by **Autosat® Wi-Fi**, the latest-generation shuttle designed for the automated storage of pallets of different depths in a traditional drive-in shelving system.

Autosat® guarantees high-density automated storage to optimise the use of the entire warehouse. **Manual warehouses can also be managed by AWMS**, thanks to the support of Android or Apple **handheld devices**, where the warehouse operator can manage manual movements independently, or through missions prompted and programmed by the AWMS server.

AWMS is the heart of the WMS shared by the Automha Software Suite.

3. The benefits of AWMS

- **ERP (Enterprise Resource Planning) software interface** - AWMS is designed to interface with any customer ERP. Thanks to its extreme flexibility, it can be expanded by verticalising entire functions quickly.
- **MRP (Material Requirements Planning) orientation** - the software performs all the basic functions of an MRP, a single software for the complete management of all internal material flows in transit, to and from the warehouse.
- **MES (Manufacturing Execution System) interface** - AWMS is designed to interface with all MES platforms.
- **User-friendliness** - the simplified and dynamic interface allows operators to interact quickly and seamlessly with the warehouse.
- **Comprehensive and customisable reporting** - with SCADA and integrated HMIs.
- **Integrated SCADA** - AWMS is the only WMS on the market which includes Supervisory Control and Data Acquisition software.
- **Best practices preconfigured for each specific sector** - promptly customised and implemented on your WMS.
- **Flexibility for your warehouse** - AWMS adopts and adapts processes to meet all specific needs.
- **It increases performance and decreases costs** - AWMS can independently identify opportunities for improving the service and increasing performance while decreasing costs.
- **WhatsApp**  - stay connected with your warehouse in real time. Receive customised notifications about your most important KPIs directly on your smartphone.
- **TeamViewer Assist AR Tablet**  - every company is provided with tablets to view **the augmented reality** of the system. If the operator needs support, he/she can connect to Automha's service department by video call. With the support of Team Viewer Assist AR, the service department then sends data, text and tag annotations of real-world objects with 3D reference markers that remain anchored to the objects even when the camera moves away from them.
- **Total reliability** - AWMS can manage all types of warehouses, from the simplest manual to semi-automated and even the most complex automated systems.
- **Access your warehouse from any device** - you can access your warehouse using the AWMS app from any device and perform specific storage operations.



4. Compliance VDI 3601

Deciding which WMS software to purchase is very difficult given the choice of systems with different performance levels and without the support of unambiguous and certified parameters to assess the quality of functions and service. Which is why we have created **shared guidelines that describe the functions of an WMS in detail and distinguish between basic and advanced functions**. The goal is to define a common background that can be identified in an architecture of flows and strategies, unambiguous and shared terminology and abbreviations.

These guidelines are based on the German VDI 3601 directive.

VDI stands for **Verein Deutscher Ingenieure**, a German association of a team of honorary engineers and experts who process the best technological findings every year.

At the heart is the basic structure of the software (**CORE**), while the **ADDITIONAL FUNCTIONS** are visible on the side.

The model proposed highlights the relations and flows that generally exist between the different parts of the warehouse system.

VDI 3601 is a unique guideline in its field, which is increasingly gaining in importance and becoming widely accepted. Nowadays, all the figures involved in the intralogistics market increasingly request adherence to this model.

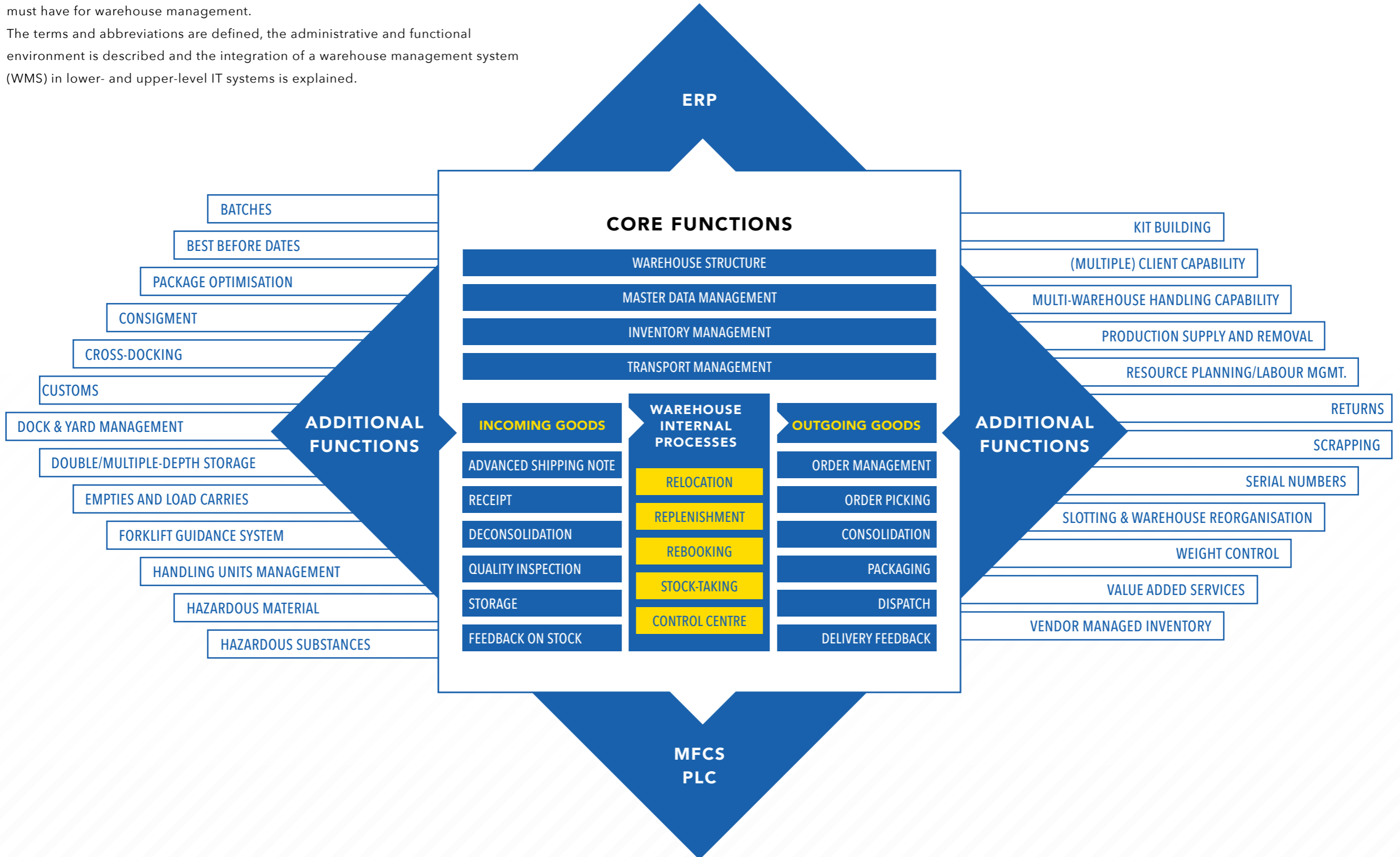
Automha decided to create AWMS based on the VDI 3601 guideline.

AWMS is VDI 3601 COMPLIANT

AWMS is compliant with the VDI 3601 standard

The standard describes the task and performance areas that each WMS program must have for warehouse management.

The terms and abbreviations are defined, the administrative and functional environment is described and the integration of a warehouse management system (WMS) in lower- and upper-level IT systems is explained.



5. The functions

A wide range of functions that fulfils all the management requirements of the logistics chain.

AWMS offers multiple levels of functionality and is equipped with several modules that provide a high degree of flexibility and customisation in order to make it easy to integrate the software into warehouses of all types and sizes.



1. INBOUND

AWMS **STREAMLINES INBOUND PROCESSES** FROM ORDER NOTIFICATION BY THE COMPANY'S MANAGEMENT SYSTEM (ERP) UP TO THE PHYSICAL STORAGE OF THE MATERIAL.

- The warehouse **user manually or automatically enters the content of the LU** (Load Unit) by acquiring all SKU (Stock Keeping Unit) barcodes etc., thus creating a new LU;
- By means of links to external services (defined as L3), the LU and its content are recognised from **information shared on the internal network of available management** systems;
- If the goods cannot be identified, AWMS **identifies and singles out the LU** in question via specific menus and deals with any identification process and the creation of new labels;
- Inbound order identified by the shipping document, ERP inbound planning, suppliers order reference;
- Internal handling in the management of LUs, between areas on the ground, manual shelving and fully automated warehouse shelving;
- **Blind receipt of LUs** with storage management of unidentified material, typically combined with subsequent specialisation flow in the specialised area;
- **Other LUs of the same kind quickly entered in succession**, a task that would otherwise have to be done manually and normally associated with manual inbound orders;
- Inbound orders with handling reason within the same warehouse or to areas on the ground;
- **LU label printing management**;
- Label printing management for article codes or direct content of the LU;
- Dispatch by Inbound to production/shipping;
- If material is missing on inbound to create a kit, the user receives a **warning** and can request **forced kitting management** or send a reservation to the warehouse with indications of the quantities for each kit.

2. STORAGE

AWMS ALLOWS YOU TO **CUSTOMISE THE POSITIONING RULES** BASED ON A SERIES OF CONDITIONS THAT CAN BE SELECTED.

The storage rules include different configuration possibilities:

- By SKU;
- By categories;
- By supplier;
- By owner;
- By hazard rating;
- By product features;
- By material status;
- By expiry date/batch;
- By weight;
- Cross-Docking for direct procurement needs from Inbound areas if there is no stock in the warehouse;
- Consolidation and compacting of the material in order to achieve very high saturation percentages and avoid physically empty/logically full issues.

3. REFILLING

AWMS AUTONOMOUSLY, OR MANUALLY, CONTROLS THE QUANTITIES OF ARTICLES STORED IN THE WAREHOUSE, DECIDING TO REPLENISH THE WAREHOUSE ACCORDING TO THE PRODUCTION SCHEDULE, THUS **OPTIMISING SHIPPING TIMES AND CLASSIC OUTBOUND ORDERS**.

- The user can **define the refilling task independently**;
- **Automatic refilling plans** are created for articles with understocking thresholds;
- Automatic refilling plans can be created by estimating production requirements based on production demands interacting with MRP, MES or ERP;
- **Refilling through the study and analysis of the customer's data history** with the option of creating useful stock refilling patterns in order to increase total saturations.

4. OUTBOUND

AWMS MANAGES THE OUTBOUND FLOW OF GOODS FROM THE WAREHOUSE, BOTH TO PRODUCTION OR SHIPPING, OR OTHER SPECIFIC AREAS.

- **Outbound planning management by L3;**
- Outbound processing with stock optimisation management strategies with LIFO (**Last In First Out**) and FIFO logic (**First In First Out**);
- Storage in the warehouse or in areas reserved on the ground for exclusive or dynamic use of shipping areas;
- The user can decide to independently **extract one LU for picking** or full extraction by selecting it from the stock;
- L3 external software programs (ERP, MES, MRP MII) control the start of outbound order execution; AWMS checks the basic conditions and ensures the extraction is performed within specific timeframes;
- **Option to cancel** an Outbound or Picking order with the option of making a decision about any LUs already reserved;
- **AWMS accepts any Picking and extraction plan**, even partial, i.e. with insufficient warehouse quantities. At the end of the process, the software can eliminate the list or suspend to execute it again later. The missing quantities for the extraction are released or kept in the list;
- The individual Picking list can be suspended manually or by L3 for warehouse requirements;
- Picking activities are queued and managed in order to increase total outbound throughput. Grouping missions or in specific areas on the ground can be organised;
- If there are several outbound areas, AWMS can decide which areas to **re-route the individual missions to** in order to ensure that outbound processes are balanced; the same process is also carried out in the event of a fault;
- **The warehouse is pre-configured** to achieve performances specifically for individual outbound orders.

5. PICKING

AWMS MANAGES PICKING FLOWS ACCORDING TO STANDARD RULES, OR ON THE BASIS OF RULES OPTIMISED ACCORDING TO SPECIFIC BUSINESS NEEDS.

- Picking to **kill all pallets**;
- Kitting function for **creating specific LUs** for typical production use;
- **Automatic receipt** of picking plans from ERP or L3;
- Option of performing picking and refilling on different SKUs (on multi-reference LU);
- **Picking plan shared between users** according to location, user specialisation or for balancing purposes only;
- Lock on the picking quantity to “mask” it from additional picking.

6. INVENTORY

AWMS ALLOWS PERFECT **CONTROL OF STOCK** INVENTORIES AND CHANGES IN THEIR STATUS.

- **Inventory on manual call** of a specific LU, with the option of quantity adjustment by a user with higher privileges;
- **Inventory on manual call** of a specific article code, batch, with the option of quantity adjustment by user with higher privileges;
- **Warehouse layout** with LU positioning;
- Optional **L3-controlled** or manual realignments.

7. SCADA

SUPERVISORY CONTROL AND DATA ACQUISITION IS THE **VIEWING SYSTEM FOR SYSTEM AUTOMATION**.

- AWMS includes a SCADA closely linked to the logic, so it is possible to view both the logical and physical status of the system on any screen;
- **Overall system view** on a single page;
- **Alarm management**, warning reset management and faults;
- **Management of motors, sensors, faults, encoders, logic missions and physical missions;**
- **Logical data management of LUs** on dedicated areas;
- Database of all alarm history managed by the system;
- Database of active alarms and immediate reset;
- **Simplified graphic interface;**
- **The SCADA system control function** allows the control system to intervene on the process in order to modify its evolution on the basis of pre-established rules or decisions made by the operator.

8. TOOLS

AWMS HAS ADDED FUNCTIONS WHICH ALLOW YOU TO **INDEPENDENTLY CONTROL THE ENTIRE WAREHOUSE MANAGEMENT**.

Basic graphs on the warehouse performance:

- IN OUT REJECT pallets;
- Cyclical values;
- Daily working hours;
- Total saturation and saturation by areas.

Tables summarising:

- Operator times;
- Times per item;
- Downtime/fault per item;
- Percentage of use per item;
- Total use time per item;
- Transfer times.

- **Analysis and customisation of data on Logistics KPIs** with link to external software (Power, BI, etc.);
- **Data analysis and customisation on Automation KPIs** with link to external software (Power, BI, etc.);
- AWMS system log;
- List and path of missions filtered by LU/Mission/Orders;
- **Local encrypted** credentials database;
- Use of company policies **for credentials management** (recommended if Active Directory is running in the company);
- Management console **for managing missions and mission steps;**
- **DashBoard with cameras** on board Automha machinery with real-time vision;
- All data from the cameras are recorded on NVRs for long-term storage of high-definition images and video;
- **Analysis of company history** to define strategies for working on high saturations while maintaining performance in line with defined specifications.

6. AWMS One, Smart & Enterprise

You can choose between three different AWMS software packages: **One**, **Smart** and **Enterprise**.



One is the solution designed for the management of manual and semi-automated warehouses supported by Autosat Wi-Fi.



Smart is the perfect software suite for the most common needs of all automated warehouses.



Enterprise is the full version with every specific function for the most diverse needs.

FUNCTIONS	DESCRIPTION	ONE	SMART	ENTERPRISE
CLIENT WEB INTERFACE	Client for access from any Web browser and any device: PC, Tablet e Mobile.	•	•	•
WAREHOUSE STRUCTURE	Definition of adjoining structure and location providing support for warehouse operation and storage.	•	•	•
GOODS / SKU / BATCHES / USERS MASTER DATA	Management of data from ERP, MES and MRP that can be updated by WMS or ERP.	•	•	•
INVENTORY MANAGEMENT	STOCK table published for external links.	•	•	•
TRANSPORT MANAGEMENT	Management of basic internal handling on manual IN OUT operation.	•	•	•
TEAM VIEWER ASSIST AR TABLET	Fault resolution through augmented reality.		•	•

INBOUND

FUNCTIONS	DESCRIPTION	ONE	SMART	ENTERPRISE
AUTOMATIC BARCODE LU MASTER DATA	The LU (Load Unit) and its content are recognised via L3 from the information shared with the management system.		•	•
MANUAL BARCODE LU MASTER DATA	The warehouse user enters the LU content acquiring all the SKU (Stock Keeping Unit) barcodes.	•	•	•
LU CLARIFICATION	If there are unidentifiable goods, AWMS identifies and singles out the LU in question, managing any identification processes and the creation of new labels.			•
INBOUND FROM SUPPLIER	Inbound order identified by the shipping document, ERP inbound planning, supplier's order reference.		•	•
INBOUND FROM PRODUCTION	Typically internal handling flow in the management of self-generated LUs.		•	•
RECEIPT BY SPECIALISATION (BLIND)	Blind receipt of LUs with storage management of unidentified material, typically combined with subsequent specialisation flow in the specialised area.			•
FAST INBOUND	Once a type of LU is defined, other LUs of the same type are quickly entered in succession, a task that would otherwise have to be done manually and normally associated with manual inbound orders.			•
INTERNAL TRANSFERS	Inbound order with handling reason within the same warehouse or to areas on the ground.	•	•	•
LU LABELLING	Management of LU label printing.	•	•	•
SKU / LU CONTENT LABELLING	Management of label printing for article codes or direct LU content.		•	•
CROSS-DOCKING	Dispatch from Inbound to production/shipping.			•
INBOUND FOR MISSING MATERIAL MANAGEMENT	If material is missing on an inbound order to create a kit, the user receives a warning and can request forced kitting management or send a reservation to the warehouse with indications of the quantities for each kit.			•

REFILLING

FUNCTIONS	DESCRIPTION	ONE	SMART	ENTERPRISE
MANUAL	The user defines the refilling task independently.	•	•	•
ON UNDERSTOCKING AND PROCUREMENT PLANS	Automatic refilling plans are created for articles with understocking thresholds.		•	•
REFILLING BY MRP OR MES (L3)	Automatic refilling plans are created on the basis of the quantities for production requirements by following the production demands controlled by MRP, MES or ERP.			•
SATURATION STRATEGY	Creation of refilling patterns to increase total warehouse saturations.			•

OUTBOUND

FUNCTIONS	DESCRIPTION	ONE	SMART	ENTERPRISE
OUTBOUND ORDER MANAGEMENT	Management of outbound orders by L3.	•	•	•
STOCK FIRST STRATEGY	Outbound with strategy to manage the optimisation of stock with LIFO and FIFO logic.		•	•
MANAGEMENT OF DEDICATED SHIPPING AREAS	Useful for further accelerating the outbound functions in the event of delayed extraction or trigger extraction.		•	•
MANUAL PICKING ON LU IDENTIFICATION	The user can decide to independently extract one LU for picking or full extraction by selecting it from the stock.		•	•
MANUAL ORDER EXECUTION	On receiving an extraction from L3, the user can choose when to extract the LUs and to which destinations.	•	•	•
EXTERNAL TRIGGER ORDER EXECUTION	L3, or other external software, trigger the start of the outbound order; AWMS checks the conditions and performs the extraction within specific timeframes.			•
OUTBOUND / PICKING ORDER CANCELLATION	Option to cancel an outbound or picking order with the option of making a decision about any LUs already reserved.	•	•	•
EXTRACTION OR PARTIAL PICKING	At the end of the process, AWMS can eliminate the list or suspend it to complete/execute it again later.		•	•
PICKING SUSPENSION	The individual Picking list can be suspended manually or by L3 for warehouse requirements.		•	•
SIMULTANEOUS EXTENDED PICKING	Picking activities are queued and managed in order to increase total outbound throughput.			•
OUTBOUND MISSION AUTOMATIC BALANCING	With several outbound areas, AWMS can decide where to re-route individual missions in order to ensure the balance of outbound orders; same procedure in the event of a fault.			•
PRE-CONFIGURATIONS FOR OUTBOUND ORDERS	The warehouse is pre-configured to achieve dedicated performance for individual outbound orders.			•

PICKING

FUNCTIONS	DESCRIPTION	ONE	SMART	ENTERPRISE
PICK TO KILL	Picking to kill all pallets.	•	•	•
PICK FOR KITTING	Kitting function to create specific LUs for typical production use.			•
PICKING PLAN	Automatic receipt of picking plans from ERP or L3.	•	•	•
PICKING & REFILL	Option for Picking (on multi-reference LUs) and Refilling on different SKUs (Stock Keeping Unit).		•	•
PICKING BY WORK GROUP	Picking plan shared between users according to location, user specialisation or for balancing purposes only.		•	•
RESERVED QUANTITY PICKING	Lock on the picking quantity to "mask" it from additional picking.		•	•

INVENTORY

FUNCTIONS	DESCRIPTION	ONE	SMART	ENTERPRISE
BY LU	Inventory on manual call of a specific LU, with the option of quantity adjustment by a user with higher privileges.	•	•	•
BY AREA	Inventory on manual call of a specific LU, with the option of quantity adjustment by a user with higher privileges.	•	•	•
BY SKU/BATCH	Inventory on manual call of a specific code with the option of quantity adjustment by a user with higher privileges.		•	•
GRAPHIC DISPLAY SITUATION WAREHOUSE STOCK	Warehouse layout with LU positioning.		•	•
L3 OR MANUAL REALIGNMENTS	Optional L3-controlled or manual realignments.		•	•

SCADA

FUNCTIONS	DESCRIPTION	ONE	SMART	ENTERPRISE
GENERAL MONITOR	Function to view the entire system on a single page. Alarm management, warning reset and faults.		•	•
AREA MONITOR	Management of motors, sensors, faults, encoders, logic missions and physical missions. Logical data management of LUs on dedicated areas.		•	•
ALARM HISTORY	Database of all alarm history managed by the system.		•	•
ACTIVE ALARMS	Database of active alarms and immediate reset.		•	•

TOOLS

FUNCTIONS	DESCRIPTION	ONE	SMART	ENTERPRISE
	Basic graphs on the warehouse performance: <ul style="list-style-type: none"> IN OUT REJECT pallets Cyclical values Daily working hours Total saturation and saturation by areas 			
BASIC KPIS AND GRAPHS	Tables summarising: <ul style="list-style-type: none"> Operator times Times per item Downtime/fault per item Percentage of use per item Total use time per item Transfer times 	•	•	•
ADVANCED KPI LOGISTIC MOTOR	Analysis and customisation of data on Logistics KPIs with link to external software (Power, BI, etc.).			•
ADVANCED KPI MOTOR AUTOMATION	Data analysis and customisation on Automation KPIs with link to external software (Power, BI, etc.).			•
USER LOG AND CONTROL	AWMS log system.		•	•
MISSION HISTORY	List and path of missions filtered by LU/Mission/Orders.		•	•
LOCAL CREDENTIALS	Local encrypted credentials database.	•	•	•
ACTIVE DIRECTORY CREDENTIALS	Use of company policies for credentials management (recommended if Active Directory is running in the company).		•	•
MANUAL INTERVENTIONS ON MISSIONS	Management console for managing missions and mission steps.		•	•
BASIC REAL TIME VISION CAMERAS	DashBoard complements Automha's on-board cameras with real-time vision.		•	•
CAMERAS WITH VIDEO HISTORY IN HIGH DEFINITION	All data from the cameras are recorded on NVRs for long-term storage of high-definition images and video.			•
COMPACTION ON SINGLE LEVEL	AWMS automatically generates compaction plans, even if other movements and/or missions are present, which compact the level and optimise warehouse spaces.		•	•
COMPACTION BETWEEN LEVELS	AWMS automatically generates LU compaction plans between levels even if other movements and/or missions are present.		•	•
COMPACTION BETWEEN AREAS	AWMS automatically generates LU compaction plans between different areas even if other movements and/or missions are present.		•	•
RULES FOR SPECIFIC SATURATIONS	Analysis of company history to define strategies for working on high saturations while maintaining performance in line with defined specifications.	•		•
MULTI-LANGUAGE MANAGEMENT	The software is automatically set to the user's browser language.		•	•

* Upon request it is possible to enable the application to manage manual and automatic commands of the Autosat through a Wi-Fi tablet.

7. Hardware Requirements

OPERATING SYSTEM

- WINDOWS 2016 Server o more recent
- Updated and correct

SERVER HARDWARE

- Minimum 4 Core Intel CPU
- OS Partition 300 Gb
- Hard disk SAS 15K Raid 5
- 16 Gb Ram minimum
- No. 2 ETH 1 Gbps
- Connection to TeamViewer
- Connection to VPN
- IIS

DATABASE SYSTEM

- SQL Server 2016 standard or more recent and installed
- SQL Server Data Partition 500 Gb minimum
- SQL Server Management Console

The fault-tolerance system depends on the client's network; if implemented, it is important to respect asynchronous replication between nodes.

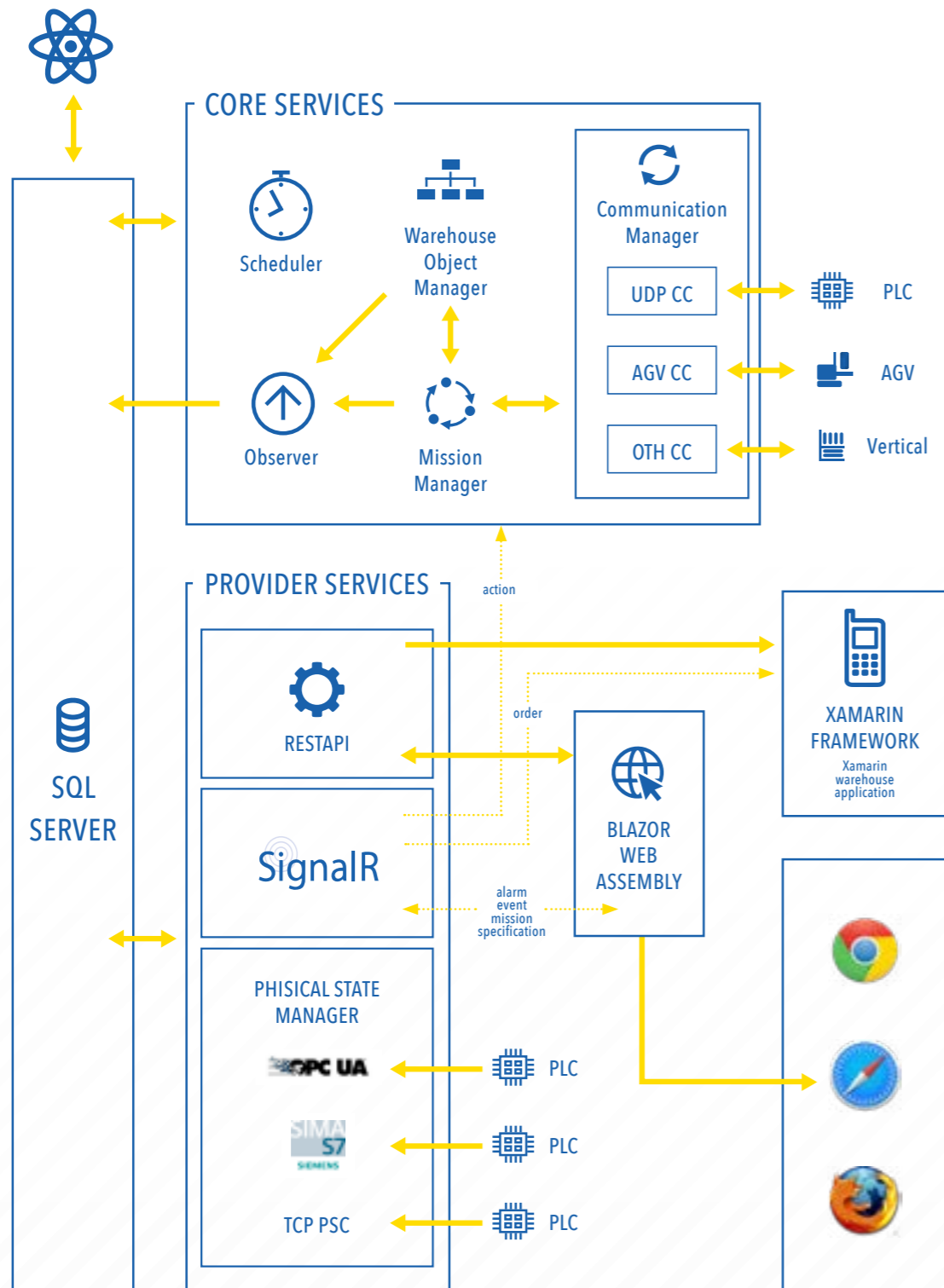
CLIENT SYSTEM

- Windows Windows 10 Client for Desktop or more recent
- Chrome web browser
- Connection to port 80 or 443 to AWMS Server

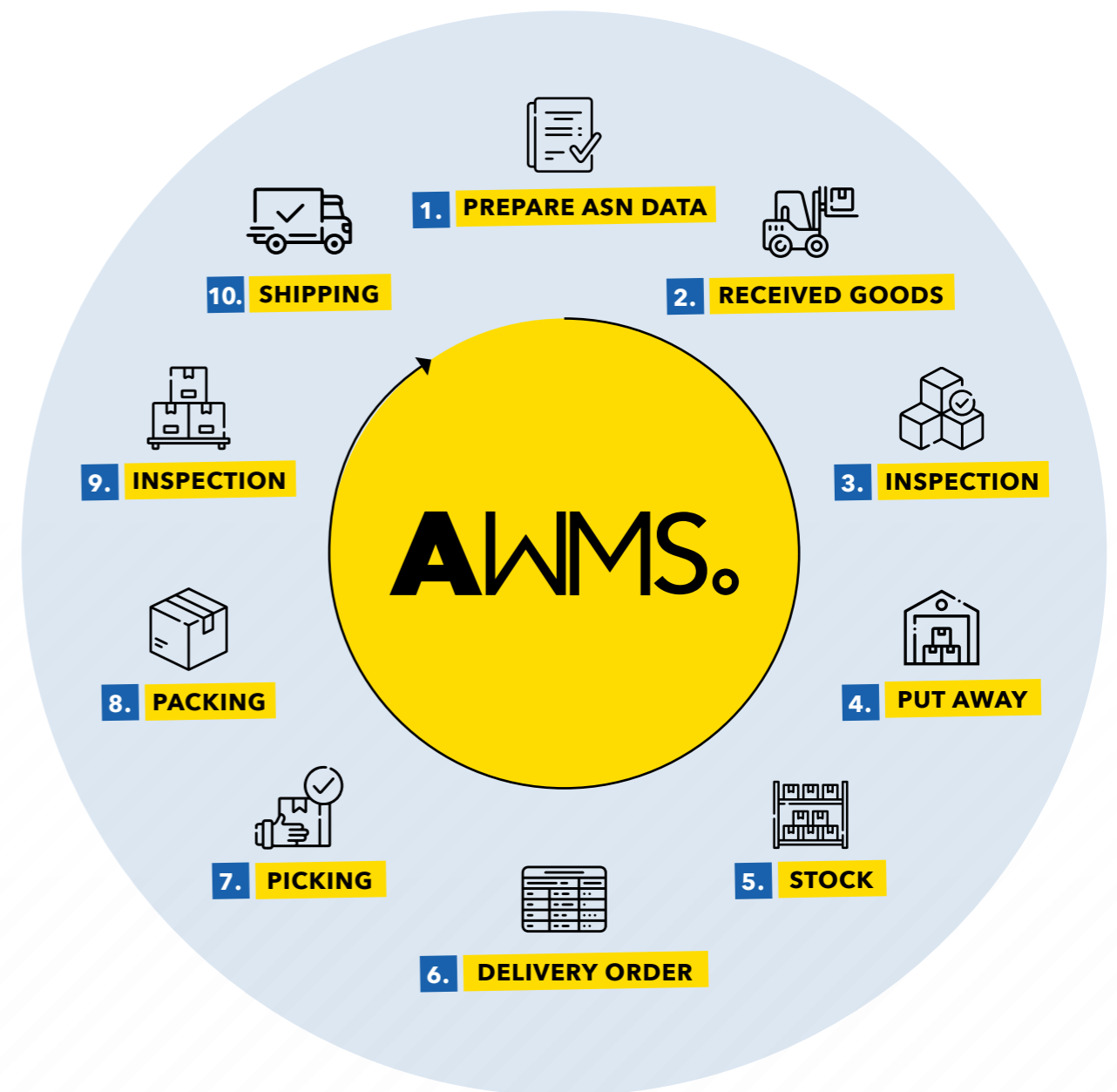
8. Partners and certifications



9. Software Architecture



10. AWMS Overview



**AWMS OVERVIEW
TO YOURS**

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