Jungheinrich Warehouse Navigation

Increase your warehouse productivity up to 25%

↑JUNGHEINRICH®

It's built for

Advantage 1:
The entire warehouse benefits.

Increased efficiency for the entire logistics system
- Up to 25 % increase in throughput and efficiency with Warehouse Navigation.
- Automatic and precise approach to the racking position specified by the warehouse management system (WMS) along the quickest route. With optimum acceleration and braking – the maximum truck speed can be fully utilized.
- No searching or back-tracking.
- No manual barcode scanning for stacking and retrieving.

Very high level of process security
- Automated processes virtually eliminate errors.
- Stacking and retrieval operations are always performed at the right locations.
- The WMS inventory is always up-to-date.

your operators.

Easy integration with the WMS

- The Jungheinrich Logistics Interface facilitates simple integration of the Warehouse Navigation into the existing IT system landscape.
- The Logistics Interface is installed as middleware on the radio data terminal. It creates a connection between the WMS and the truck.
- No functional changes to the WMS required.
- Changes to the warehouse topology are not required.

Improved ergonomics for the operators

- Significantly less strain on the operators, who no longer have to search for items.
- Relaxed operation as ancillary jobs such as searching and scanning no longer apply.

Enhanced protection of the overall system

- Less rack and product damage since the forks are automatically positioned at the rack level.
- Since RFID transponders are embedded in the ground, the technology is not sensitive to damage or signal interference.

Energy savings

- Optimized movements help minimize the amount of energy used.
- Reduction of the warehouse lighting is possible by illuminating the target position using the order picking spotlights.
- The automatic stacking procedure saves time and energy when retrieving a pallet.

## Advantage 2: Maximize productivity with a simple command.

1. **The warehouse management system (WMS)** transmits the next rack location to be reached to the Logistics Interface on the truck terminal.

2. **The Logistics Interface** translates the data and passes it directly to the truck controller. The truck now knows the next position to be reached.

3. **RFID Transponders in the floor** communicate the precise, current position within the aisle to the truck.
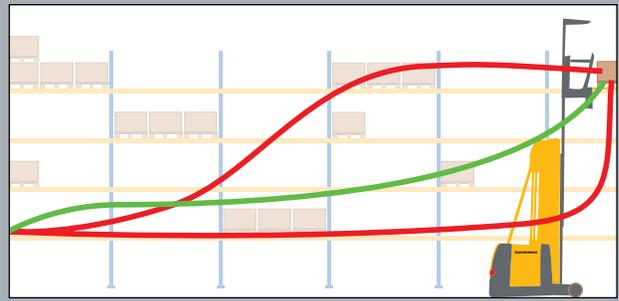
■ 28 seconds – fastest route using Warehouse Navigation
■ 36 seconds – common routes

The comparison –
with/without Warehouse Navigation:

The optimized approach with Warehouse Navigation achieves time savings of up to 25 %. The green curve proves this: In the shortest time and over the shortest distance, with as little time wasted as possible.

The Bathtub Effect
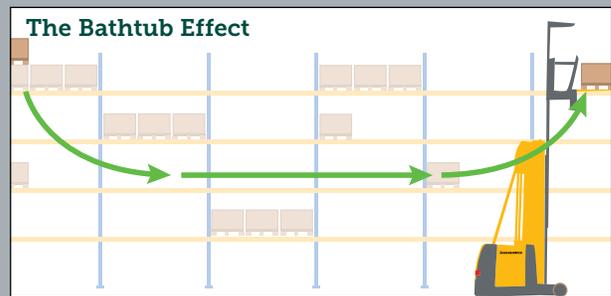
■ most efficient route

Intelligent destination approach:

The truck controller calculates the quickest way to the target position. All processes required for positioning, such as travel route, speed, lift start, and lift height are performed in an optimized manner via simple thumb activation of the travel control.

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4. A simple command by the operator activates travel.

5. The truck calculates the optimal path and travels automatically and precisely to its destination using the fastest, most efficient route.

6. Positioning lights illuminate the target location upon arrival directing the operator to the correct side and gives them better visibility.

7. A simple command initiates the automatic stacking or retrieval of the pallet.

8. The Logistics Interface sends a confirmation automatically to the WMS, saving the operator from scanning.

9. And on to the next job. The WMS transmits the next rack location to be reached to the Logistics Interface on the truck terminal.
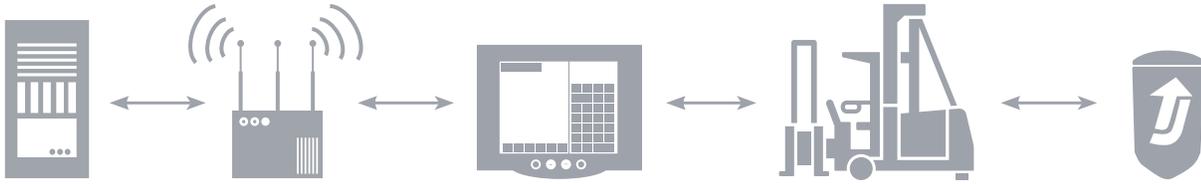
Advantage 3:
Easy connection of the trucks to your existing IT systems.

The WMS server transmits the position of the next racking location to be reached to the truck terminal via the WLAN. The Logistics Interface translates the data and passes it directly to the truck controller.

Consequently, the truck now knows the next bay to be reached. The truck positions itself within the aisles using the RFID transponders in the floor and is therefore aware of its current location at all times.
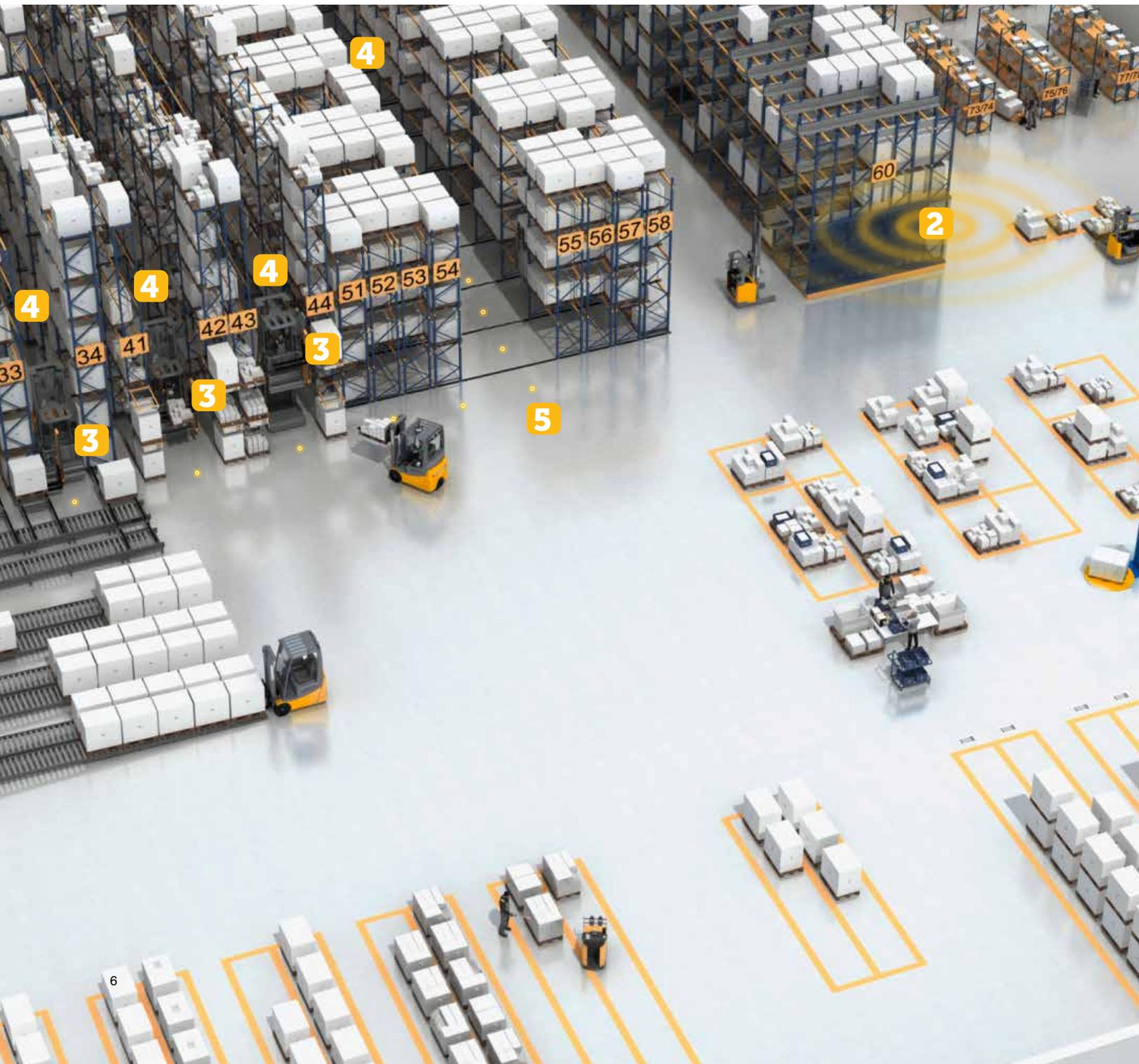
1 WMS server **2** WLAN access point **3** Radio data terminal **4** Truck **5** RFID transponders

LOGISTICS INTERFACE

Advantage 4:
Our extensive offering of turret trucks and order pickers can be outfitted with Warehouse Navigation.

Turret Trucks

2/1

EKX 514 / 516k / 516
Man-up turret truck - 80 volt
Up to 3,500 lbs. capacity
Up to 708" lift height

EKX 410 / 412
Man-up turret truck - 48 volt
Up to 2,600 lbs. capacity
Up to 404" lift height

EKX 514 / 516k / 516 (freezer package)
Man-up turret truck - 80 volt
-22°F to +28°F

EFX 411 / 414
Man-down turret truck - 48 volt
Up to 3,000 lbs. capacity
Up to 354" lift height

Order Pickers

2/1

EKS 414s
High level order picker - 48 volt
with open platform
3,000 lbs. capacity
Up to 492" lift height

2/1

EKS 412s
High level order picker - 48 volt
with auxiliary mast
2,200 lbs. capacity
Up to 492" lift height

2/1 = Qualifies for 2 Shifts On 1 Charge
Guarantee

*Product shown may be different than the actual configuration based on market requirements.

Jungheinrich Warehouse Navigation
Since 2009

Warehouse Navigation includes

Function	EKX	EKS	EFX	Description
Intelligent destination position control	•	•	•	Prevention of incorrect, time-consuming journeys. Example: For standard entry in the drive direction in a dead-end aisle, the truck identifies that the last storage locations in this aisle can only be approached in the load direction and notifies the operator accordingly when the job is assigned.
Entry direction	•	•	•	The truck identifies which direction the truck is facing when entering the aisle and automatically compensates for the route measuring differences in the positioning.
Automatic aisle detection/stop for incorrect entry	•	•	•	Entry into an aisle that does not match the job order is prevented and the operator is notified visually in the display. Wrong journeys and incorrect positioning are avoided.
Automatic stacking procedure	•		•	Once the truck arrives at the designated pallet location, the operator issues a command to pull or put away pallet automatically. This improves efficiency and process security.
Positioning accuracy: Horizontal +/−1.2" (30 mm)	•	•	•	Stacking and retrieval of pallets. The positioning accuracy depends on the transfer and collection of the pallets. Adjustments are possible if the pallets were not centered when loaded.
Positioning accuracy: Vertical +/−0.2" (5 mm)	•		•	Positioning accuracy for pallet stacking operations with and without load.
Positioning accuracy: Vertical +/−0.8" (20 mm)		•		Positioning accuracy for pure order picking mode.
Pick-by-Light	•	•		For use with order picking. Upon arrival at the rack location, a mast-mounted spotlight will illuminate the pick position on the correct side of the truck. This shows the operator which side of the truck to pick from, as well as giving them better visibility to the pick location.
Stack-by-Light	•			For use with full pallet handling. Upon arrival at the rack location, an overhead guard-mounted spotlight will illuminate the pallet position on the correct side of the truck. This shows the operator which side of the truck to pull or place the pallet, as well as giving them better visibility to the rack location.
Full pallet movement vs. order picking mode	•			Based on the type of order sent by the WMS, the truck approaches the designated location accordingly: - full pallet movement: the truck arrives with the forks positioned to engage the pallet - order picking: the truck arrives with the operator compartment positioned at pick location

Warehouse Navigation Processes

Function	EKX	EKS	EFX	Description
Full pallet movement	•		•	Full or partial pallet put away and retrieval. A "relocation" order can also be sent for a two-stage retrieval and stacking order.
Order picking	•	•		The truck arrives with the operator compartment positioned in front of the desired location for easy retrieval of loose cases/pieces from the racking.
Empty pallet collection	•			In mixed applications with full pallet movement and order picking, pallets which have been emptied during the course of the shift can be collected systematically.
Position detection	•	•	•	The WMS can check the current truck position at any time. If the truck is within the VNA system, the position is reported back to the WMS.
Location / order confirmation	•		•	Confirmations can be sent back to the WMS automatically at the completion of an order which was initiated by the WMS. This saves the operator from scanning the rack label at each location.
Delete order	•	•	•	Deletion of an active order can be initiated by the WMS.

Technical Connection Ways

Standard interface options	WMS to LI	LI to WMS	Description
ASCII file transfer	•	•	Text files are exchanged between the WMS and the Logistics Interface. With web-based WMS clients, the needed files can be directly generated with a JavaScript command which is embedded in the websites of the WMS client.
TCP/IP telegram	•	•	The WMS server or WMS client can transmit data to the Logistics Interface via a standard socket connection.
Webservice with WSDL (SOAP)	•	•	Jungheinrich provides a standard WSDL. In this WSDL a function call is defined which accepts any text and reports a call confirmation.
Database exchange table	•	•	Supported database systems are MS-SQL, Oracle, SQLite and MS-Access.
REST Interface	•	•	Jungheinrich provides a REST endpoint, to which multiple clients can connect
Telnet	•		Wavelink TE Client emulation software must be used. Supported Telnet protocols are IBM5250, VT220 and VT100.
Keyboard buffer		•	The reply data is written into the keyboard buffer of the radio data terminal.

Offline solutions (no connection to a WMS)

Standard interface options	Description
Touch screen entry	The operator can enter the next rack location to be reached on a custom graphical user interface (GUI) developed by Jungheinrich.
Entry via barcode scanner	The operator can scan a barcode containing the next rack location to be reached on a custom graphical user interface (GUI) developed by Jungheinrich.

WHO IS
Jungheinrich?

THE LEADING ELECTRIC
LIFT TRUCK MANUFACTURER

Our name may sound strange – JUNGHEINRICH (Young-Hine-Rick).
But it's a name you should know. We're the world's leading brand of electric lift trucks. While others are new to electric, our 5th generation technology and more than 60 years of electric lift truck design experience allow us to deliver two shifts on one charge – guaranteed – for greater productivity.

Strong Local Support And Expertise.
» 340+ dealer locations throughout the US, Canada and Mexico
» 24-hour parts delivery guarantee
» Industry's only 1,000-hour service intervals

Run 2 Shifts on 1 Battery Charge – Guaranteed
Never stop a shift to charge, and take your operations to a higher level.
» Guaranteed to run 16 hours on a single battery charge
» No interim charging
» No battery changing
» No additional battery needed
» Offered on several Jungheinrich models

JUNGHEINRICH

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