Enabling Visibility for Warehouse and Yard Operations

ESSENSIUM

EPS^{TM} RTLS

Typical Applications and Benefits

The long range and high accuracy of this tracking solution, both indoors and outdoors, provides high process visibility into warehouse and yard operations. This enables various applications and competitive benefits for users:

- *Full Visibility*

  The EPS™ installation provides continuous visibility into the location of tracked vehicles and goods across the warehouse and yard installation.

- *Easy Integration into WMS*

  The open API allows the EPS™ tracker server to be easily integrated into the Warehouse Management System, or Yard Management System, of the end user. This then can provide full visibility into the location of all goods in the storage facility.

- *Locate Equipment Quickly*
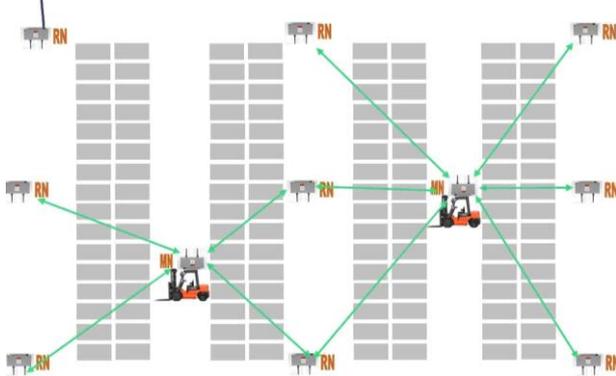
  The system enables the quick location of goods and equipment such as forklifts and stackers, even across large premises and yards stretching several kilometers in length.

- *Avoid Missing Items*

  The continuous tracking prevents situations arising where goods or containers are misplaced. This then yields savings both in terms of the cost of missing goods, and the time involved in searching for them.

- *Error Prevention and Tracking*

  As the WMS system is aware of the location of all goods, along with the active pick orders for each operator, it can identify situations where an operator picks an incorrect pallet. This can then trigger a warning message to the operator, while the transport of the incorrect goods is still tracked and updated correctly in the system.

- *In-Cab Identification*

  An in-cab display can be used to inform the vehicle driver of the identity of goods pallets and containers being approached. This removes a source of operator error, as well as avoiding the process delay and health impacts of operators needing to visually identify or scan the pallets themselves.

- *Security and anti-theft*

  Various security measures can be adopted, such as:
  - Trigger Alarm if vehicle moves outside of authorized zone.
  - Trigger Alarm if vehicle moves outside of authorized time zones.
  - Trigger Alarm if vehicle moves without presence of authorized driver id.
  - Trigger Alarm if sensors are disabled.

- *Workplace Safety*

  Having continuous real-time visibility on the location of all transport vehicles on the premises enables a number of safety applications, including:
  - **Pedestrian Zones** can be defined, with alarm signals or even automatic vehicle braking being activated if a vehicle enters a Pedestrian zone.
  - **Speed and Height Limits** can be defined and enforced for various zones.
  - **Proximity Detection** can be used to trigger warnings and to slow or stop vehicles operating within preset distances from each other.

EPS^{TM} RTLS

- *Lean Logistics and Six Sigma*

$$6\sigma$$

EPS^{TM} provides high visibility which enables the implementation of Lean and Six Sigma programs to improve the quality and optimize the process flow within the warehouse and yard management operations.

- *Action Replay*

An integrated application can use the data from EPS^{TM} to enable a ´fast forward´ replay of all tracked vehicle and goods transport movements.

- *Detection of Process Bottlenecks*

The action replay mode can be used to visually detect process bottlenecks in the daily operation of the warehouse or yard. Alternatively, the database of tracked movements can be used to enable automatic software analysis of the logistics process and identification of process bottlenecks and optimization opportunities.

- *Virtual Tagging*
  - o *Tag the Carrier, Track the Goods*

Multitude of Tags   **Minumum of Tags**

"Goods located in Zone B"   *"Goods located at X,Y,Z coordinate"*

The high accuracy and range of this system means that it can also be used to implement a mode of virtual tagging where the identity and location of all goods are tracked without the need for additional tags on the goods themselves. This yields additional savings due to the reduction in labor and material costs associated with tagging the individual goods or pallets.

- *Tracking of ´Untaggable´ goods*

The Virtual Tagging mechanism also enables the tracking of goods such as dry bulk, where physical tagging is not possible.

- *Vehicle Service Control*

By providing an accurate record of all vehicle movements, the system can be used to generate reminders for usage-driven service needs.

- *Driver Training and Evaluation*

The ´action replay´ functionality can be a valuable feedback tool during driver training activities, as well as enabling the ongoing evaluation of both regular and temporary staff.

- *Pick-Order and Pick-Time Optimization*

By being aware of the location of all goods on the premises, and the forklift or other vehicles, the WMS system can identify the optimum pick orders for each operator.

- *Damage Prevention*

The system records can be used to identify the vehicles and drivers involved following the detection of collision damage to goods or infrastructure on the premises.