SmartStock.WMS

Warehouse Management System

High Performance **Real Time** Warehouse Management Solution

www.smartstock.biz

SmartStock
Warehouse Management System

- **Reliable, robust and high-performance solution for paperless warehouse management based on mobile terminals, bar codes and wireless network.**
- **Unique open system architecture ensures outstanding system flexibility, easy, fast and effective integration into existing ERP system and provides possibility to execute changes in functionality in a flexible and quick way based on user requirements.**
- **SmartStock.WMS increases the warehouse productivity and significantly eliminates the potential risks of errors in execution of all warehouse operations and data entries. By providing accurate, detail and prompt information about all warehouse operations it brings high added value for your logistic decision-making.**

Warehouse Management System (WMS)

WMS deployment in warehouses has been forced by constantly increasing pressure on enhancement of inventory turns, requirements on better warehouse space optimisation, mistakes and confusions reduction in picking and not least also by requirement on increase in operations effectivity and labour productivity. Along with the development of wireless technology enabling on-line interconnection of mobile computer technology with ERP system, there is a significant tendency to shift from paper managed systems to on-line systems based on wireless Wi-Fi network in a warehouse and handheld terminals with integrated barcode scanner.

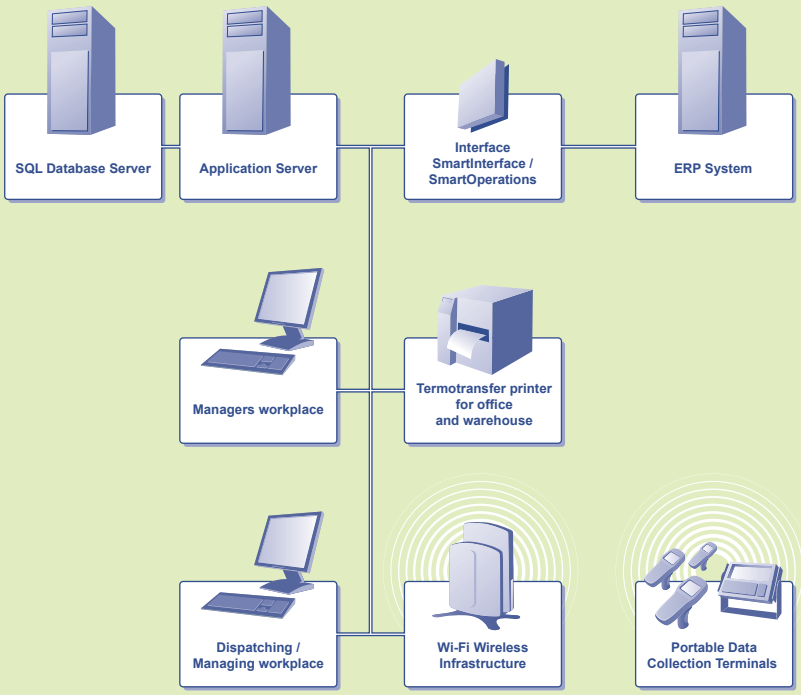
Technology

SmartStock.WMS is a complete solution for on-line paperless warehouse management. System is based on unique identification of each item in a stock by means of barcodes. The barcodes are used also for identification of all warehouse locations and handling units within the scope of movement of goods in the warehouse and also for identification of shipments leaving the warehouse.

Workers in a warehouse are equipped with wireless handheld terminals along with integrated barcode scanner. All instructions and information for transactions in warehouse are received by each worker directly on terminal display and each operation is confirmed by means of scanning the barcode label on goods, racks or pallet. The on-line network connectivity within the warehouse locations is ensured by means of wireless network operating in 2,4 GHz band in compliance with 802.11b Wi-Fi standard. The warehouse signal coverage is ensured by access points that are connected to the fixed ethernet enterprise network.

Security and Reliability

SmartStock.WMS is an independent system operating on dedicated application server or directly on enterprise server. The system requirements are the server operating system Windows 2000/2003, access to database server MS SQL 2000-2005 and the installation of telnet server. The SmartStock.WMS application itself runs as a server application. Telnet client is activated only on handheld terminals and communicates with server application. Thus the own application does not run on terminals. There are no data stored and only the results of the communication with the server application are



img.1
SmartStock.WMS System Architecture

displayed. Along with the transactional data processing and its safe storage on SQL server this is the assurance of outstanding robustness of whole system and high resistance against any loss or data corruption. If the terminal batteries get discharged during the operation or the terminal gets out of range of radio frequency signal it will have no influence on smooth run of application and data storage.

Hardware Independence

System architecture built on telnet server / client is an assurance of independency on suppliers and types of handheld terminals. The application can be operated on any wireless terminal that support telnet, function keys F1 to F10 and the display size is at least 20 character x 16 lines, i.e. Motorola, Intermec, LXE, Teklogix, HHP, Datalogic.

Functionality

The elementary system philosophy has been built on SKU allocation for incoming orders. Allocation can be executed manually, automatically or with regard to defined substitutions of one item by other. This way the system enables stock allocation to sales orders, on-time replenishment of fast-flow locations, possibility of alerting on missing goods or response on specific customer requests eg. minimal required expiration period etc. At the same time the information about the successful or unsuccessful allocation is available immediately. The system provides also the information why the stock allocation was not successful.

Almost all operations in the warehouse are executed with the support of handheld terminals: receiving, SKU allocation, put-away, replenishment of fast-flow locations, picking, packaging, shipping, cycle counting and stock taking, unwrapping, repacking and other service functions.

The necessary part of SmartStock.WMS is a SmartReport module that provides complete overview over all orders being executed in the system and overview over current real time warehouse status. Thus provides very important information for order process management and management of warehouse operations.

Warehouse configuration, rules settings, parameters settings, access rights settings including warehouse module settings are carried out in an administrator‘s SmartAdmin module.

Flexibility

The important feature of a modern IS is the capability of adaptation to user processes. This counts especially in the case of Warehouse Management Systems because logistic processes and user business practices are characteristic by vast variability of requirements on system functionality and differ markedly from customer to customer also within the same industry. SmartStock.WMS in this respect offers vast and unique flexibility. SmartStock.WMS has been projected as an open system that enables not only effective integration into each business information system but also extraordinarily flexible and fast change of functionality and thus quick response on customer requirements. Its fundamental philosophy has been built on the existence of the development core which documentation is available for implementation and development partners. In this way it is possible to change or add the required functionality on the implementation level in a very effective way. There are unified tools for creation of packing lists, address labels and other tags included into the system. There is a possibility to execute these changes on implementation level and user level as well.

Integration Into ERP System

SmartStock.WMS has been built on the state-of-the-art Microsoft .NET platform. This kind of unique system architecture enables outstanding system flexibility and fast implementation into existing ERP system independently on the platform the ERP system has been built. For the system function it is necessary to ensure mutual communication with ERP system. In direction out of the IS are imported the instructions and the information for picking, purchase orders for received goods control and the changes in the stock items database. Into the IS are exported data about the goods actually picked, goods received and inventory differences.

The communication with the system SmartStock.WMS can be executed through basic XML interface providing data about all warehouse operations. The other possibility is to use the set of interface functions in the form of .NET DLL libraries.

Ergonomy

The system layout has been highly subordinated to the requirement on application control simplicity from the handheld terminal. Extraordinarily complex business logic of the server application has been transformed into easy and clear instructions on the terminal display. Thus the operating staff is not burdened and overloaded with unnecessary information.

SmartStock.WMS Benefits

Accurate And Intime Order Fulfilment

SmartStock.WMS provides advanced tools for order process management and management of stock allocations for these orders. Stock allocation runs continuously and automatically according to defined rules including rules for substitutions and further with regard to serial numbers, lot codes or period of expiration. The system provides also possibilities for executing manual stock allocation and thus enables to allocate all available stock in a warehouse to orders without regard to defined rules.

A warehouse dispatcher keeps at disposal a precise information about the status of particular orders and level of order processing. In real time he/she can immediately find out which part of the order and how many items have been already allocated, picked, packed, shipped and also she/he gets the information about workers who currently work on a particular order.

Dispatcher disposes of advanced and simple tool how to manage processing of particular orders effectively and the way that these orders are prepared for shipping completed and in assigned time. Each warehouse operation is immediately recorded and the check of its correctness is executed simultaneously. This way the order is picked on-time, precisely and also without errors as could be the goods mistakes, incorrect amount of pieces or incorrect lot codes or wrong entry of period of expiration.

Real Time Exact Warehouse Inventory Control

All warehouse operations and goods movements are recorded by the system in real time and at the moment when they have arisen.

User keeps at disposal absolutely exact data about the goods status on a warehouse including serial numbers, lot codes or period of expiration. System monitors not only the exact current location of particular item but also the carriers (pallets) on which the goods has been located.

A user disposes of accurate and on time data about all warehouse operations, orders status, goods present in a warehouse or workers working loads. SmartStock.WMS offers advanced tools that support creation of variety of statistics and reports over current and historic data.

It is possible to track and evaluate the performance of individual workers, monitor the goods flow through a warehouse, goods velocity and the average balances, as well as analyse particular warehouse processes or warehouse working load and its specific locations.

Accurate and real time warehouse inventory control minimises the risk of loss and any risk of theft. Further the SmartStock.WMS ensures that the goods will be picked on time without any loss due to expired duration or guarantee period of particular goods. Last but not least the system supports accurate material planning, effective warehouse space utilisation and thus facilitates optimal resource allocation bound in stock, machinery or amount of people working in a warehouse.

Optimisation of Warehouse Operations

SmartStock.WMS optimises all warehouse operations with regard to maximal effectivity and simplicity of all operations. The system can be set up in a way that it thoroughly leads the warehouser while executing the warehouse operations. It is also possible that the operations are managed by warehouser but also at the same time system controls if the operation was executed correctly and with respect to defined rules. Consistent control of all warehouse operations eliminates the risk associated with human factor.

SmartStock.WMS offers complete set of advanced tools for warehouse process optimisation and effective processing of particular warehouse functions eg. executing batch orders, wave picking, cross-docking etc.

Real Time Paperless Warehouse Operations Management

SmartStock.WMS records all operations executed in warehouse in real time and based on this information generates the electronic documents about the goods movement in a warehouse. The system is completely paperless, eliminating all the errors associated with paper being lost, damaged, misplaced or misfiled by manual data entering from paper documents. Further system eliminates costly archiving of paper documents.

Labour Productivity Increase

SmartStock.WMS manages all warehouse operations with regard to maximal effectivity and simplicity of all operations. Thus together with control of all executed operations and precise warehouse stock control significantly enhances the labour productivity.

SmartStock.WMS enables to track and evaluate performance of individual workers and in case of any mistake it is easy to trace responsible person. Individual responsibility and clear system leads to increased workers motivation and further increase in labour productivity.

Modules Win32

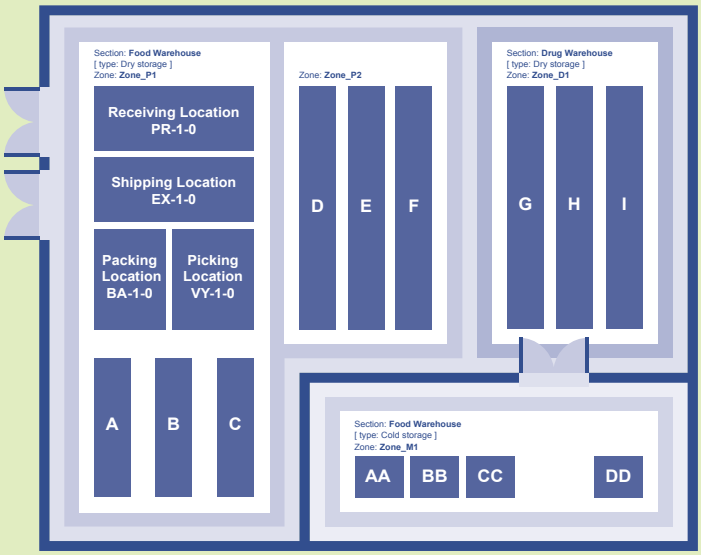
SmartAdmin Module

SmartAdmin Module serves for parameters settings, SmartStock.WMS system configuration and for rules settings for particular operation. SmartAdmin module serves also for creation of three-dimensional 3D warehouse model with all warehouse, receiving, packaging and shipping locations. Simultaneously it serves for definition of particular sections and zones, determination of optimal access routes and reference points for put-away and goods allocation with respect to goods velocity. From the user level it is possible to execute any changes in warehouse configuration eg. adding new racks, change racks location, temporary blocking of appointed warehouse locations etc. in a very flexible way.

The area of a warehouse can be divided into sections and zones. The partition on sections enables to define warehouse locations with specific storage conditions. On each stock card there is a given information in which section is permitted to store the particular goods. The sections can be defined as eg. dry storage food warehouse, cold storage food warehouse, dry storage drug warehouse. In this way it is ensured that each goods has been put-away on the right location according to pre-defined rules. Independently on warehouse partition on sections it is possible to define the dividing into zones. For each defined zone you can assign access rights to certain workers who can work in given zones only. The input orders are than divided into single sub-orders according to sections or zones definition and the whole order is consolidated from particular sub-orders in the packaging location.

SmartReport: dispatcher / manager module

The manipulation with entry data for picking (incoming orders) can be executed by dispatcher through SmartReport module. Dispatcher has the possibility to combine many orders into one wave / batch that will be than processed as one order, to change the order priorities, to plan the order picking on specific time or let the orders pass through this module automatically and transparently to be processed in SmartStock.WMS. Simultaneously the module provides information about all operations in a warehouse, status of particular orders, level of order processing, status on goods receiving, inventory discrepancy information, information about workers working load. All orders present in the system can be seen here. The module offers the possibility to monitor in-process orders and their status of processing along with the information about percentage of order processed and workers who work on the particular order presently. This module enables to insert the orders directly into the system too.



img.2
Warehouse Partition into Zones, Sections and Locations

Terminal Functions

Goods Receiving

Receiving can be executed with or without the control against the document imported from ERP system (eg. purchase order). Operating staff scans particular packages or single pieces by scanning the barcodes and stows the goods on pallet marked with barcode and pertinently enters the data about the amount of goods from the keyboard. If there is a flag defined in the stock card for serial number tracking, lot codes or period of expiration the operating staff will be requested to enter this information from the terminal keyboard or by scanning the barcode carrying this information. As far as the full pallet shipments are equipped with pallet tag with information according to EAN128 standard, the receiving can be executed simply only by scanning all barcodes from the tag. All given information are decoded automatically and processed within the scope of pallet receiving. When goods receiving has been executed the data are exported through interface into ERP system.

Crossdocking

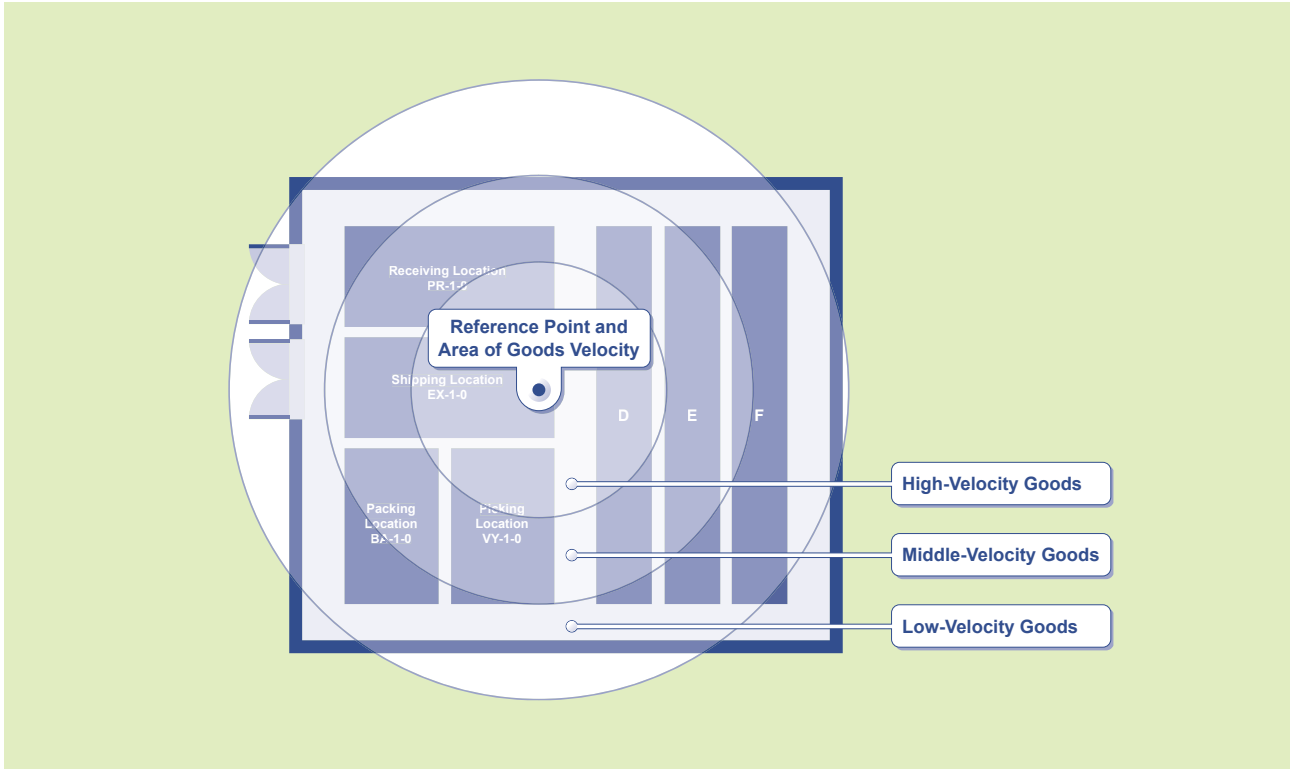
After receiving the goods stays in the receiving location till the moment when is put-away process executed. If the requirement on replenishment of fast-flow locations or order for fulfilment of goods allocated in the receiving area arises, the goods is preferentially picked away right from here and the put-away process will be skipped. The suitable goods for cross-docking can be booked and blocked by the system or can be assigned by dispatcher within the framework of receiving. Thus the goods remains in receiving location until it is picked for particular order.

Put-Away

The goods location in the warehouse is determined by the system either automatically by warehousing rules (section) and in relation to how often the goods must be re-stocked. During put-away process the warehouse staff scans the bar code from the pallet (carton) and according to instructions moves it on given location. The put-away correctness is confirmed by warehouse staff by reading the barcode from the label on the rack. The second put-away method enables to let the selection of warehouse location on warehouse staff who only by scanning the address from the rack notifies the system where the goods has been stored. Also in this case the defined rules for put-away are checked.

Replenishment

The system supports two types of replenishment – regular and emergency. Regular replenishment is activated once or more times in a day, depending on the pre-set configuration and generates orders for locations replenishment, based on their minimum and maximum capacities. Emergency replenishment is generated on



img.3
Respecting Goods Velocity in a Warehouse

regular basis in case that the system contains an order which has to be completed and there is not requested article on a replenishment location. In both cases the warehouse staff will receive the instructions on terminal display about the pallet with requested article, from where and where it shall be replenished into order.

Kitting

The kitting function enables assembling of components into kits. Kit represents a set of items, components of varying quantities, that supposed to be picked from the inventory as a whole. SmartStock.WMS supports import of sets, kits, from ERP system, kits marking with product labels and further handling with such a newly created sets. System provides kit tracking during its entire flow through the warehouse, detailed definition of kit´s parameters, configuration of obligatory and optional kit items and specify the item´s sequence. Within the kitting function, it is possible to create so-called dynamic kits, that represents the kits with the same identification but different content.

Picking

Picking can be executed by single orders or by batch orders as well. A batch order may contain any amount of single orders that from certain reasons have been grouped effectively together into a batch. One of the reasons can be a requirement on picking of several orders at given time eg. for certain carrier or haulage line. Another reason for grouping orders into batches is significant productivity increase at processing of many smaller orders that moreover contain the same items. In case of single order processing eg. of 5 orders it would mean to execute 5 routes from shipping location to a warehouse and back and 5 selections of the same item from a warehouse. In case of batch order processing it is possible to group all 5 orders into one batch (manually or automatically according to defined rules) and to pick the complete batch at the same time. During the packaging process the entire picked batch is divided correctly into single orders and each order is checked and packed separately.

By selecting a choice of picking in the terminal menu the all available orders and batches will be displayed on terminal screen along with a parameter of the order scale. These orders will be imported from ERP system and can be further modified within the dispatcher module. The operating staff will be prompt on a terminal display about new orders and according to their access rights they can sign up for particular orders. In case the order was divided according to sections or zones into several sub-orders, only such items of the order will be displayed to the particular warehouse staff that comply with his/her access rights set up and have not been processed yet. At the moment there can be any amount of warehousers signed up for one order fulfilment as far as they have the access rights set up to the given zone. Also anybody of the warehouse staff has a possibility to sign off from the order execution eg. at the moment he/she gets the order with higher priority. The orders in the stage of processing are displayed on the terminal screen along with a flag and information about its percentage fulfilment.

Packing

Within the scope of picking each order or suborder are directed to a particular packing location. The completeness of whole order can be checked here optionally. Than the packing list gets printed to be included into the packing and the whole order is packed.

Shipping

After the whole order is packed the shipping process follows. The address labels get printed on the termotransfer printer along with data about the consignee, order number, shipping note number, weight or any other by user optional data. Each consignee can theoretically use different format of labels with different information. Than the cartons / pallets are moved to the transit location and definitely shipped out of the warehouse. Within the framework of truck loading the data like truck licence number, driver name etc. can be added to each shipment. Than the data about the shipped goods are exported into the ERP system.

Cycle Counting

Cycle counting is a regular, routine procedure which you use to count a limited amount of stock, according to date or bin. Cycle counting function continuously generates the tasks for inventory counting on given warehouse locations and it can be performed at any time, concurrently with all other warehouse operations. On each stock card you can enter the counting interval for this item. While respecting this interval the system for each item generates the order to count this item in concrete warehouse location at the moment when the amount of such item gets near to zero. The warehouse staff will be prompt to enter the actual amount of goods on terminal display at given warehouse location, the system compares it with presumed status and generates the report about the discrepancies between the inventory reported by the system and the actual inventory stored in the warehouse. These discrepancies are to be solved and to be accepted by the worker with given authorization and access rights. The tasks for cycle counting are generated automatically. They get stored into database and can be executed by the workers at any time eg. during the period when there are no other tasks in the system. The data about the inventory discrepancies are exported into ERP system.

As a cycle counting record can be also considered a control inquiry on the quantity status at the moment when the pallet is empty.

Version	Easy	Express	Enterprise
Number of concurrent users license in basic price	3	3	5
Number of printers license in basic price	3	3	3
RECEIVING			
PO receiving	●	●	●
Non-PO receiving	●	●	●
One-step put-away	●	●	●
Putting goods on-hold until quality check		●	●
Pallet receiving according to UCC/EAN-128 labels	●	●	●
RMA processing	●	●	●
Crossdocking			●
Product label printout support	❍	❍	●
PUT-AWAY			
Staff-directed put-away		●	●
Put-away rules verification		●	●
System-directed put-away			●
Put-away from the pallet to multiple locations		❍	●
ALLOCATION			
Allocation with respect to lots, expiry dates and serial numbers		●	●
Automatic goods allocation by orders after receiving			●
Substitution			●
Multiple allocation strategies		●	●
PICKING			
Multiple pickers on the same order at the same time	●	●	●
Supermarket picking (without purchase order)	●	●	●
Packing and shipping within the picking		●	●
Multiple picking strategies	●	●	●
Unpacking support		❍	●
Replenishment by order, emergency replenishment			●
Min-Max replenishment			●
Wave picking			●

Version	Easy	Express	Enterprise
PACKING AND ASSEMBLING			
Goods assembling before packing	●	●	●
Packing list printout	●	●	●
SHIPPING			
Truck load record	●	●	●
Weight calculation		❍	●
Bill of delivery / packing printout	●	●	●
Shipping label printing	●	●	●
Unique labels/ packing slips / bills of delivery for each purchaser / forwarder			●
OTHER WAREHOUSE OPERATIONS			
Inventory moving		●	●
Stock and pallet information	●	●	●
Location information		●	●
Putting goods on-hold for re-use in warehouse and consequent enabling		❍	●
Kitting			●
INVENTORY CONTROL			
Lots, expiry dates and serial numbers record	●	●	●
Pallets record	●	●	●
Location record		●	●
SKU / packsize	●	●	●
Full-warehouse inventory counting	●	●	●
Cycle counting	●	●	●
Detailed recording of all executed warehouse operations	●	●	●
History and reporting	●	●	●
Cycle counting on location with near-zero status	●	●	●
Size, colour and version support			●
Products with variable weight / length			●
Returnable containner tracking		❍	●
GENERAL FEATURES			
Max. number of concurrent users	8	8	∞
User / operation access rights	●	●	●
Multiple warehouse / building support			●
Multi-zone, multi-sector support			●
Multi-company / 3PL support			●

Legend:

- ● part of the version
- ❍ can be purchased on demand

Barco
Barcode Solutions

Barco, s.r.o.
Okruzni 741, 686 05 Uh. Hradiste
Czech Republic

tel.: +420 572 520 052
fax: +420 572 520 032
e-mail: sales@barco.cz

www.barco.cz