

CRISTAL

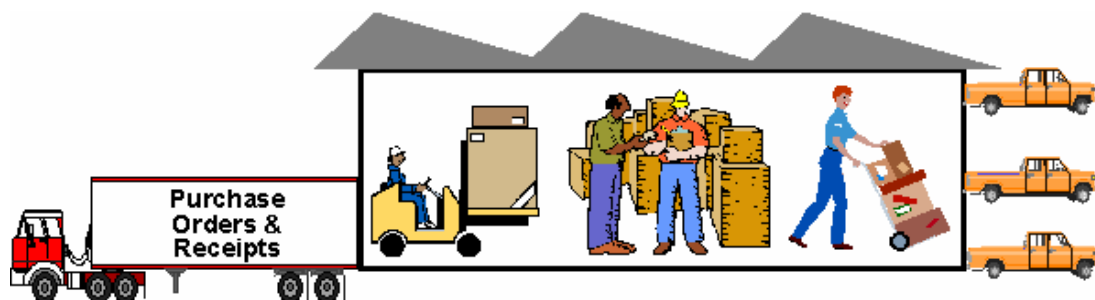
Warehouse Management System

Ease of use

Easy to Maintain

Optimize Productivity

Affordable



Copyright 1999 - 2005

CRiSTAL Solutions Pte Ltd, All Rights Reserved

Website: <http://www.cristalsolutions.com>

Updated: 10 May 2005

Overview

Conceptualised and developed by a team of professional logisticians, **CRISTAL** Warehouse Management System is designed to manage the warehouse operation in accordance to the supporting requirement by the Supply Chain.

Incorporated, as standard, with Product Ownership and Stock Ownership, the system is designed to meet both 3PL and private warehouse operational requirement.

The system is designed as a budget WMS that meet the demand of small to medium size enterprises of a system to help manage their warehouse operation and improve its productivity but without the huge investment that is usually required.

Given the objective, **CRISTAL** WMS is designed to be simple and user-friendly but features-rich so as not to incur hefty implementation and consultancy fee. The database used by the system is Microsoft SQL Server - a highly versatile database that would meet the need of most of warehouse operation. It also helps to keep the maintenance cost down – with the widespread usage of Microsoft products, skilled resources required are readily available. It runs on Windows network, which eliminates the requirement for expensive server.

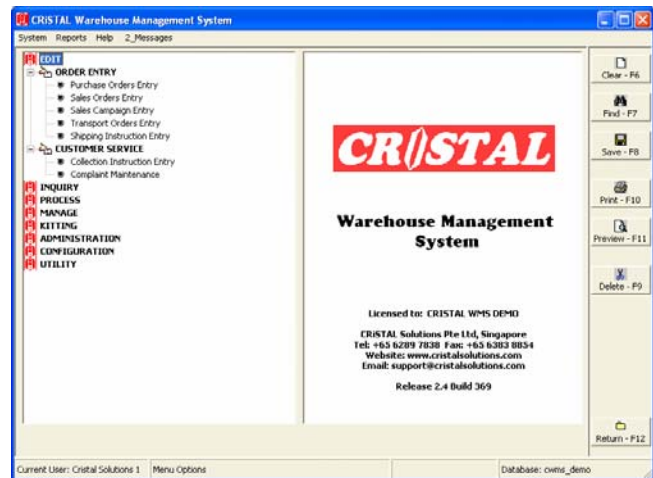
The WMS can be deployed as a paper-based, RF/wireless based or combination of both. The system is proactive – it assigns storage locations are for putaway of pallets basing on rules defined by the warehouse manager. One of the rules is putaway based on dynamic requirement of the products – fast-moving / slow-moving. This would only need the operator to confirm completion of task, thereby reducing the keyboard entry that usually is the primary source of errors. Error level is further reduced with RF equipment or with keyboard wedge scanner, for paper-based operation, and barcode in the receiving area.

RF capability is enabled with IEEE 802.11b wireless network together with Windows Pocket PC based PDA with/without barcode scanner. These substantially reduce the cost of RF deployment.

Users can pick any Pocket PC based PDA – industrialised or otherwise – to implement the **CRISTAL** RF Warehouse module according to their preference and budget.

The functionality of the system includes:

- Receiving
- Cross-docking
- Split Cases
- Putaway
- Load Planning
- Picking (directly from bulk storage or pick faces)
- Scan-Pack (Sort & Pack)
- Replenishment (of pick faces)
- Despatch/Shipping



- Stocktaking and cycle count
- Kitting and Bill of Materials

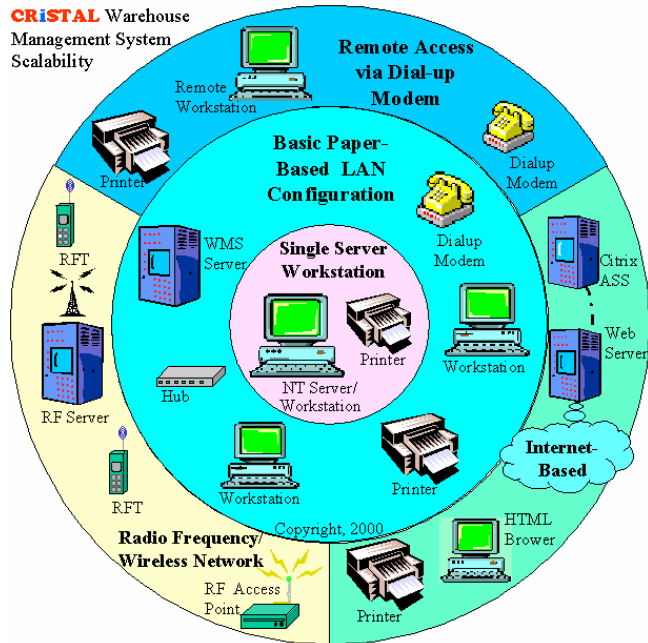
Scalable and Internet-deployable

CRISTAL Warehouse Management System is built based Thin Client Software Architectural concept.

This allows the system to be highly scalable, enabling it to be deployed as a standalone workstation-server, on a Local Area Network or Internet-based Wide Area Network (WAN).

Such scalability minimises the risk that is usually faced by organisation when implementing WMS to enhance their operation.

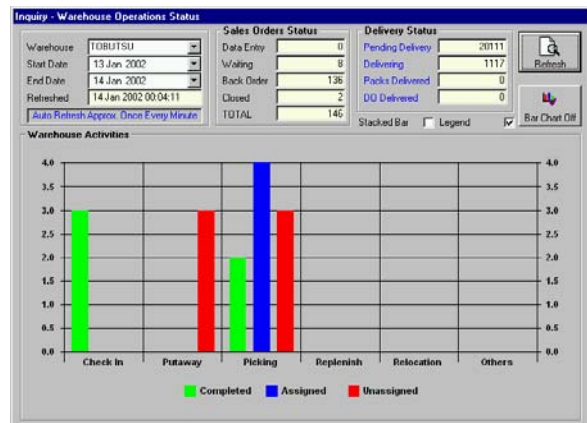
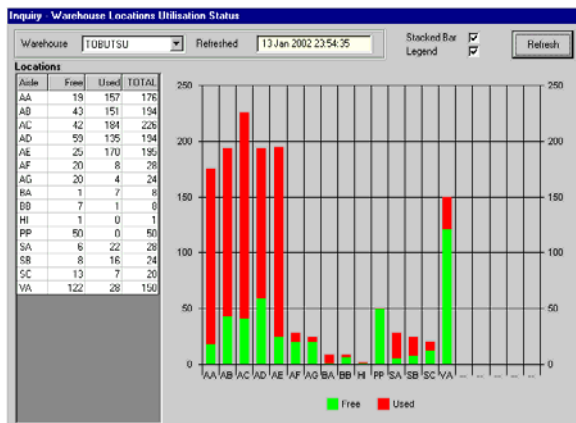
Client can start off with a single workstation and gradually grow the system to manage their warehouses globally via the Internet backbone and allowing their customers to access and obtain real-time information.



Combining the Internet capability with Radio Frequency technology, users, regardless of his physical location would be able to know the latest inventory, order status and place an order so long access to Internet is available.

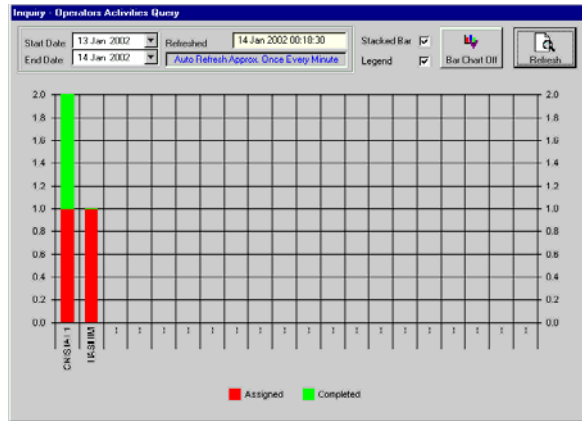
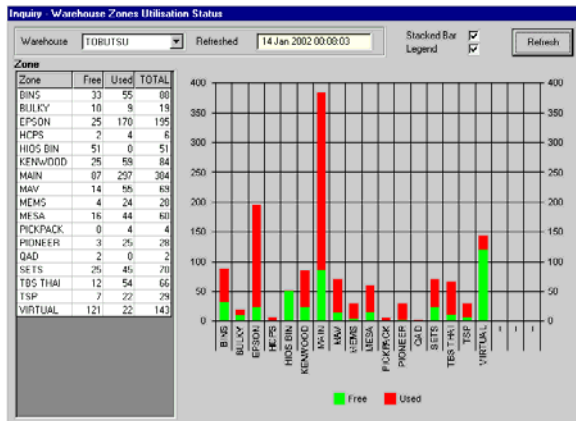
Real Time Monitoring

CRISTAL WMS incorporate real time query on the warehouse activities and utilisation. This enables managers to monitor the warehousing operation on a remote basis.



This real time monitoring displays are refreshed automatically every minute allow the managers to keep track tasks that happening in the warehouse. By changing the period to be displayed, management can query on the number of tasks completed by the operators.

Coupled with Internet deployment, warehouses can be monitored anywhere in the world. Real time status of location utilisation will enable sales people of 3PL operation to make commitment to their clients on space availability without jeopardising the warehouse operation.



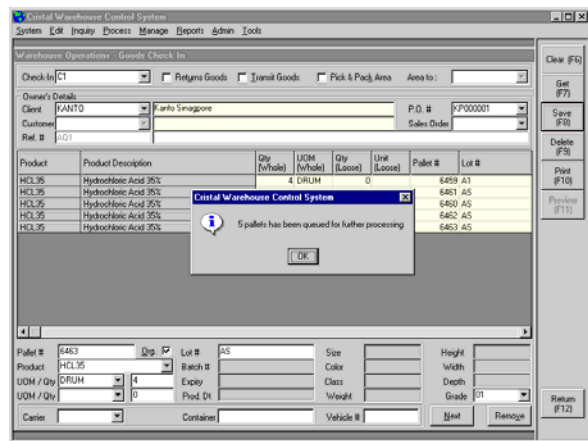
Receiving

Receiving is the single and probably the most important function of any warehouse operation. To minimise receiving error, the system incorporates intelligent feature that enforces discipline in collection of data that is relevant to stock management during receiving.

CRISTAL is designed to overcome the problem usually faced by paper-based operation by track every piece of item placed on a pallet – each pallet is assigned a unique pallet number and its movement in the warehouse is tracked until the item is picked and delivered to a customer.

To facilitate receiving, the system generates receiving barcode label which is then used to tag the goods received using RF terminals or keyboard wedge scanner - a poor cousin of RF terminal but just as effective.

The inventory rotation methodology used is a combination of FIFO and productivity with exception of Use-by Date products, which is on strict FIFO.

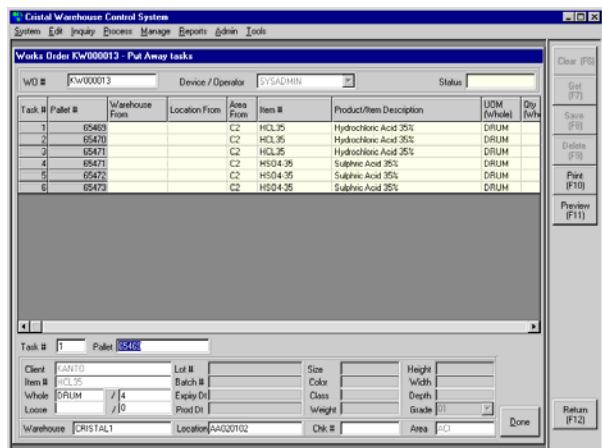


Putaway

Locations for putaway of pallets will be assigned by the system based on the zoning of the pallet locations in the warehouse.

Each item is to be specified a primary and secondary storage zones. The system will then assign locations for putaway accordingly. For convenience of replenishment to the pick faces, pick face of the item is preferably in the same zone as the storage locations.

Warehouse management can zone and re-zone all the locations in the warehouse as and when dictated by operational requirement.



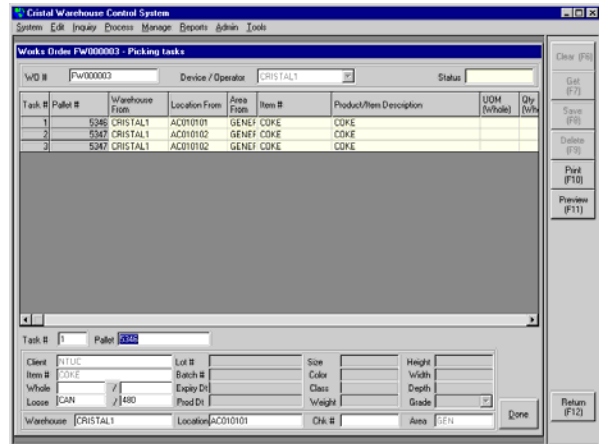
To ensure optimal utilisation of precious warehouse space, **CRISTAL** WMS is designed to also handle multiple items per pallet and multiple pallets per locations.

With the latest release, **CRISTAL** WMS incorporated dynamic assignment of storage location for incoming pallet base on the picking activities or demand of the product.

Picking

Allocation of stock for picking is based on strict FIFO for use-by date controlled item. For non use-by dated product, allocation of stock is also based of FIFO but with overriding based on productivity. That is, if a required quantity is more than the balance in the pick face, the next oldest stock location for picking will be allocated. This is to avoid emptying a pick face and then replenish it. The balance after such picking will then be transferred to the pick face automatically or on the next replenishment.

Loose picking requirement are separated from full pallet picking and pick lists are generated accordingly.

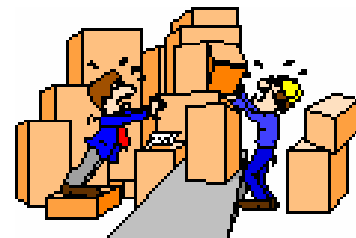


Replenishment

Replenishment is the process of topping up the preferred pick bin or pick face of a product. The process is the key to the productivity of a warehouse where loose picking is the norm.

The system based replenishment level set in the system automatically generates replenishment for pick face when the level is reached or fallen below.

The quantity to be replenished is per specified by the user for the location.



Despatch

After an order has been picked, the cargoes are held in the despatch zone. While its original pallet label identifies a picked full pallet, pallet made of loose picking is to be labelled with a new pallet label. This is to facilitate truck loading.

Inventory in the system is updated only after the delivery manifest is printed for an order.

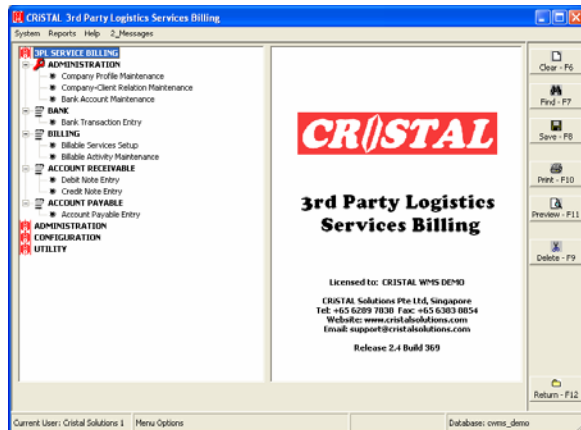


3PL: Product/Stock Ownership

Incorporated with both Product Ownership and Stock Ownership, the system is designed to enable warehouse operation, whether 3PL or private, to meet the ever-changing requirement of today business.

8 different picking methods are incorporated to enable 3PL operators to meet different customer requirement together with the capability to print delivery order in format as required by different customers

Logistics Services Billing



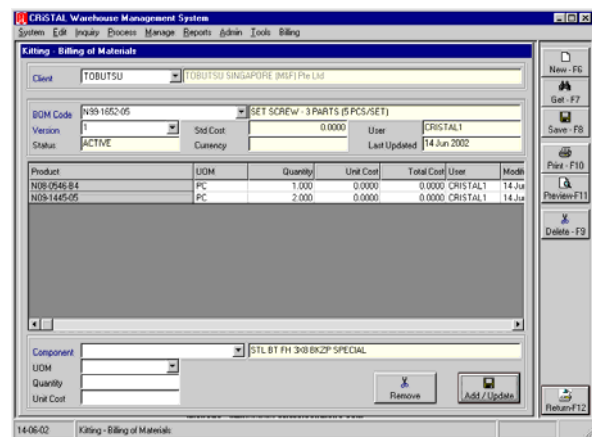
To assist business in the management of its warehousing cost and the 3PL warehouse operators in justifying the billing of logistics services rendered, the WMS incorporated a configurable automated logistic activities based billing module that enable the warehouse management to collect data critical to their Key Performance Indicators reporting and/or purpose of internal accounting or billing of clients for services rendered.

Over 1000 permutations of storage costs is built into the system to provide 3PL operations with the flexibility and competitive tools that is needed in today business.

Kitting

As organisations attempt to get leaner in their operations, they inevitably outsource more and more of their non-core manufacturing functions to 3PL logistic operation. One of the key activities that are frequently assigned is Kitting – the assembly of components into a complete set for production.

To facilitate 3PL in this activity, CRiSTAL WMS incorporate a Kitting Module that enables end-users to maintain the Bill Of Materials that will help them provide the service to their clients.



Reports

The standard CRiSTAL WMS incorporate over 60 different reports templates – all formatted with Seagate Crystal Reports™.

As the requirement of reports by one organisation differing from another, users can use Seagate Crystal Reports™ to format additional required reports.

Users are also given the rights to modify the standard reports that are provided.



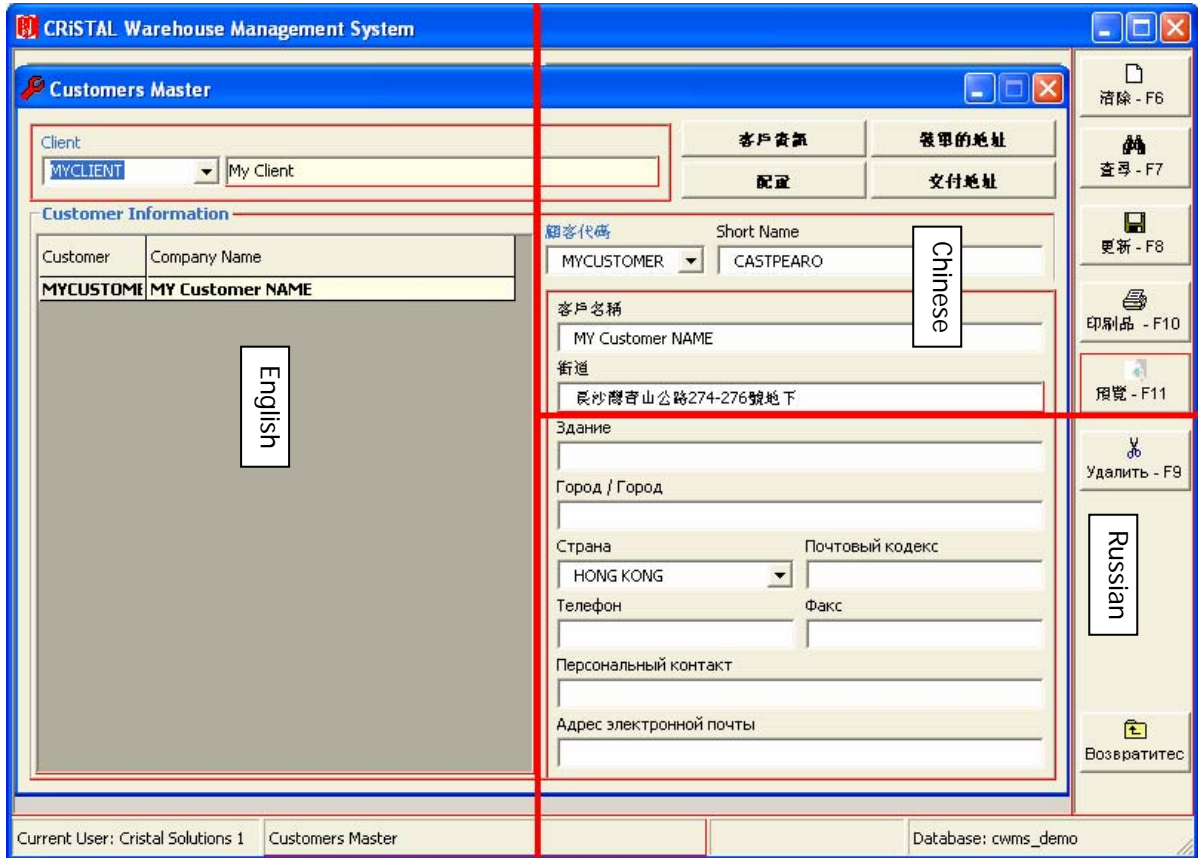
Multi-Language Enabled

CRiSTAL WMS is enabled for multi-languages, including Asian languages such as Chinese, Japanese, Korea and even Russian

Designed with user-definable field caption capability, it allows users to customize and specify the language or terminology that they are preferred. Each user can choose the language to be displayed.

This eliminate the hefty cost that non-English users usually been asked to pay when require screen description to be translated to their native language.

The DIY (do it yourselves) approach, beside reduce deployment cost, also allows users to describe and translate each term in accordance to their preferred terminology.



CRISTAL Suite of Logistics Solutions



Hardware and System Requirement

Server Configuration (minimum)

Pentium 500MHz or better (multi-processors upgradeable) completed with:

- 256 MB RAM
- 2GB hard disk storage preferably with mirroring configuration or RAID 5
- Preferably partitioned into at least 2 Drives – C: & D:
 - With a minimum of 1.6GB for Drive D:
- WINDOWS NT / 2000 / 2003 Server Operating System
- Microsoft SQL Server 2000 Database

A higher end Server is highly recommended for better performance and/or the set up is for more than 5 users and/or Database size of above 1 Gigabytes.

Backup equipment is also recommended in accordance to user requirement.

For more information: please refer

<http://www.microsoft.com/sql/evaluation/sysreqs/2000/default.asp>

Client Configuration

Pentium 200MHz or better completed with:

- 256 MB RAM (Windows NT/2000/XP Workstation) or 32 MB (Windows 98/ME)
- Minimum 15 MB free hard disk space.
- WIN NT / 2000 / XP Workstation OR Windows 98 / ME
- Display driver configured to 800 x 600 pixels



Solutions Pte Ltd

26 Hillside Drive, #01-01

Singapore 548945

Tel: (65) 289 7838 Fax: (65) 383 8854

Authorised Distributor: