



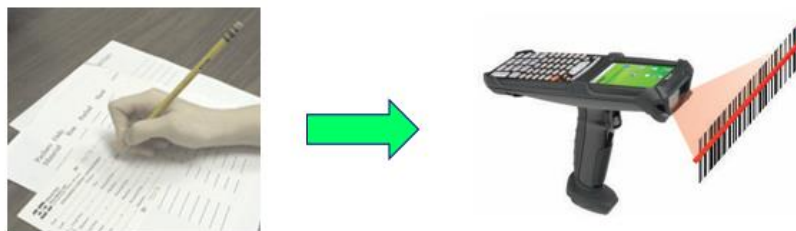
### BellHawk Job and Materials Tracking System (JMTS) Data Sheet



#### Introduction

The BellHawk Real-Time Job and Materials Tracking System (JMTS) is manufacturing software that enables operations managers and their staff to track their inventory and manufacturing operations in real-time in one integrated system.

JMTS is used by a wide-variety of manufacturers, with a special emphasis on those organizations doing short-run, custom or semi-custom, quick-turn production runs. JMTS is used by food, pharmaceutical, and medical device manufacturers, as well as by engineer-to-order organizations in the construction and defense industries. It is also used by repair and maintenance organizations as well as by industrial distributors who do secondary operations such as kitting and assembly.

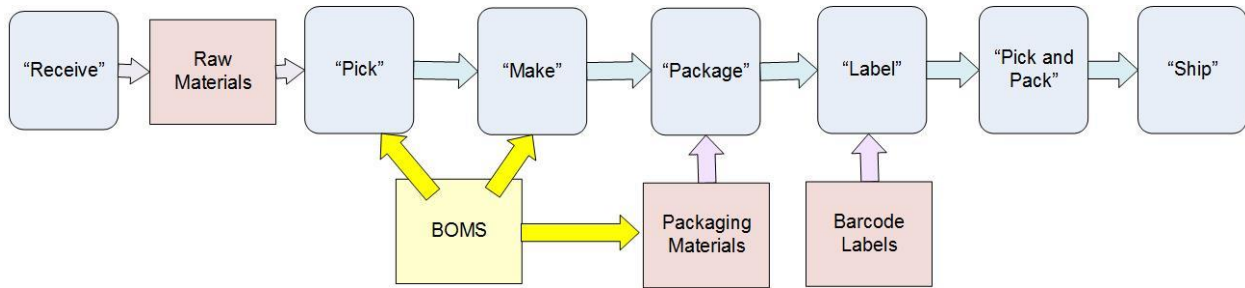


JMTS enables manufacturing and industrial distribution organizations to transition from using paper forms and manual keyboard data entry to track their operations and inventory to using technologies such as barcode scanning and mobile computing for real-time data capture.

BellHawk JMTS also:

- Provides a real-time view of the status of inventory and production operations
- Optionally, integrates full industrial warehouse management capabilities
- Tracks materials by lot and serial number and expiration date and tracks customer owned materials as well as project inventory and assets.
- Tracks WIP materials as they flow from work-center-to-work-center
- Helps prevent mistakes such as using or shipping the wrong materials
- Accurately captures the cost of making each batch of product
- Captures traceability history data as to what materials and parts were used to make each product and who the products were shipped to.

## Overview



JMTS tracks the receipt and put-away of raw materials, their transformation through a sequence of production operations into intermediate and then finished products, and then their packing and shipping to customers. This enables manufacturing organizations ensure that customer orders get delivered on-time and that they have adequate materials on-hand to make those orders.

JMTS integrates industrial warehouse management capabilities, based on the use of license-plate-number (LPN) container tracking principles, with real-time tracking of work-in-process materials as they flow from manufacturing operation to operation, in real-time.

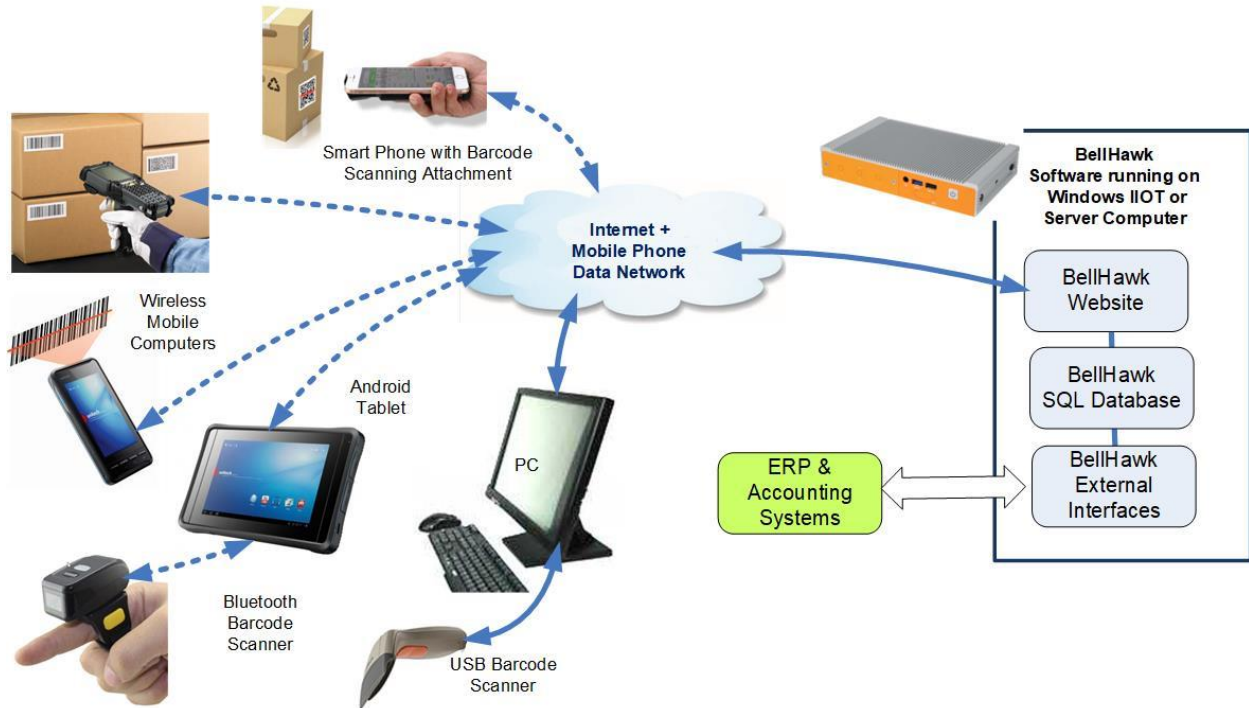
JMTS integrates the capabilities of the JTS Job Tracking System and MTS Materials Tracking System products and adds many capabilities, including the ability to store Bills-of-Materials (BOMs) and routes to make products. These BOMs and routes can be directly entered into JMTS or can be imported from ERP or similar system.

JMTS uses these BOMs and routes to generate work orders to make a specified quantity of product. These work orders can then be used to record the materials used at each stage of manufacture of the products, to track WIP materials produced and consumed by the manufacturing operations, as well as tracking the finished products. This enable JMTS to track the cost of manufacturing each batch of products as well as capturing its materials traceability history.

In JMTS, BOMs can also be used to generate Pick Orders to pick the materials for each manufacturing operation. They are also used to warn employees if they attempt to use the wrong materials to make a product and/or to pick the wrong products from a warehouse or stockroom.

JMTS not only tracks raw, intermediate, and finished goods inventory but it also tracks predicted future inventory levels. It does this in real-time by taking the physical inventory level of each part, adding the quantities on-order on purchase orders or scheduled to be made by manufacturing jobs, and subtracts materials to be consumed on planned manufacturing jobs and/or on ship orders to customers. This results in a time-phased prediction that can be used as the basis of manual or automated reordering of more parts.

## JMTS Technology



The BellHawk JMTS software consists of a specialized website and a SQL server database, which run on a Windows IIOT or Windows Server computer.

With JMTS, data can be collected using any web-browser based device with an integral or attached barcode scanner. No special software is required to be installed. Just point the device's web-browser to the URL of the client's MTS website and start collecting data.

Information collected in the SQL Server database can then be viewed from any web-browser based device, including mobile phones, over a secure encrypted data link, anywhere a user has an Internet or Intranet connection.

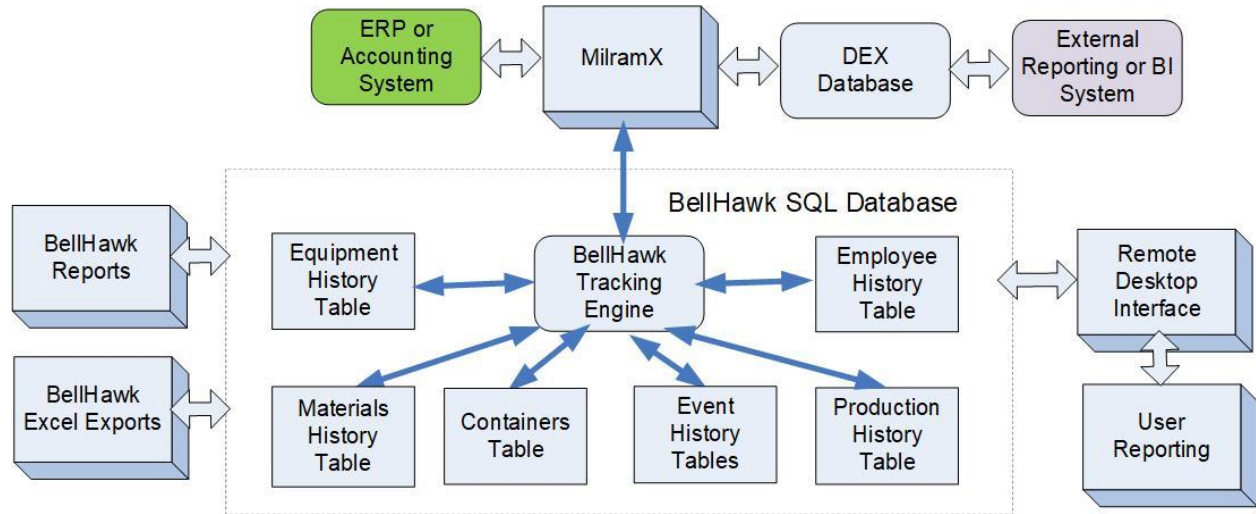
The JMTS software is based on a rules-based expert-systems engine that enables the MTS system to be readily configured and customized for a wide-variety of applications by clients importing rules in the form of Excel spreadsheets.

JMTS does not need the use of a barcode label printer as barcoded work orders can be printed out using an office laser printer. MTS can also use preprinted rolls of LPN tracking barcodes to track containers of material.



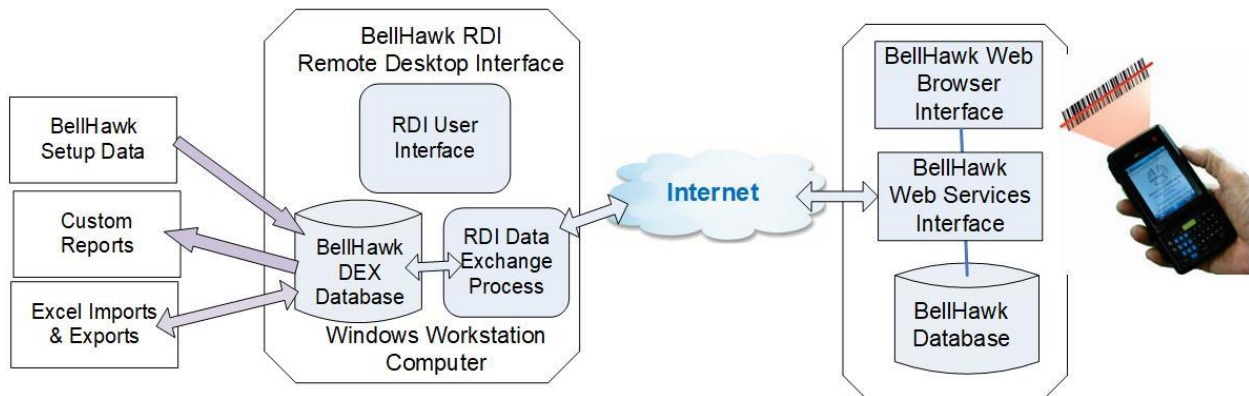
Where printing of custom barcode labels is required, clients may use the optional TAG Barcode Label Printing software in conjunction with barcode label printers to print out barcode labels where needed. Please see the data sheet on TAG for details.

JMTS comes with a set of standard reports, in the form of PDF or Excel exports, which are accessible through its web-browser interface.



For those JMTS users who want to create their own custom reports, a Remote Desktop Interface (RDI) is available.

The RDI software uses the free Microsoft SQL Server Express database server to create and maintain a copy of selected tables within the BellHawk database on a local data exchange database (DEX) on a user's desktop PC. Users can then use Excel to create their own exports from this database or can use third party reporting software, or programs written in a language such as Python, to generate their own custom reports from the DEX database.



With the RDI, data written into the DEX database is exported to BellHawk enabling the transfer of setup data as well as work orders into the BellHawk database from Excel spreadsheets.

Please note that the RDI transfers are run under control of a user program on the user's PC desktop. As such, the RDI is not intended for 24x7 unattended operation. For this, the MilramX-based MDEX system, which runs on a Windows Server computer, should be used.

JMTS can be run stand-alone or can automatically exchange data with a variety of ERP, accounting and other enterprise systems, as well as will systems belonging to supply-chain trading partners. This is typically performed using the MilramX Enterprise Decision Support System (EDS) system which runs on a separate Windows Server computer.

Also please see separate data sheets for the BellHwk Job Tracking System (JMTS) and on JMTS Bills of Materials (BOMS) for details on how JMTS uses work orders and BOMs to track manufacturing operations.

## **JMTS Benefits**

1. JMTS is manufacturing software that integrates real-time production and inventory tracking with a full-range of industrial warehouse management capabilities. This eliminates the need to try to integrate separate job tracking and warehouse management systems.
2. JMTS can work stand-alone or with a wide-range of different ERP and accounting systems. It can be used on an affordable subscription basis, in the Cloud, or can be installed on each client's own computers.
3. JMTS makes it easy for material handlers and equipment operators with limited computer skills or for whom English is a second language to accurately capture production and inventory data by using technologies such as barcode scanning.
4. JMTS provides real-time status information on the progress of customer orders and can provide scheduling guidance to help ensure that customer orders get shipped on time.
5. JMTS enables manufacturers to avoid unnecessary overtime costs, expedited shipping costs, late delivery fees and lost customers due to poor scheduling of work.
6. JMTS provides real-time status of available inventory to enable the use of Lean inventory practices, while avoiding stock-outs and making or buying excess inventory.
7. JMTS helps prevent mistakes such as picking, using, or shipping the wrong materials or materials that have not passed QC inspection or have passed their expiration date.
8. JMTS can track pallets with many different materials, including those with different lot and serial number, loaded onto each pallet. It can then make sure that each pallet gets loaded onto the correct truck for delivery to customers or distribution centers.
9. JMTS uses License-Plate-Number (LPN) container tracking methods which are required for supply-chain integration as well as compliance with Government agency and standards requirements for tracking materials.
10. JMTS tracks performance data, such as how long operations take, as well as test, scrap and rework data. It also tracks QC Test failures including reason codes. This can be used as the basis of Kaizen performance improvement activities.
11. JMTS accurately captures materials traceability event history data to enable rapid detection of the source of defects and minimizes the scope and cost of resultant recalls.
12. JMTS is a CFR 21 Part 11 compliant barcode data capture system for tracking materials. This enables validation to meet FDA requirements for Pharmaceutical and Medical manufacturing applications without paying a million dollars or more for Part 11 compliant software.

13. JMITS can track materials at multiple geographic locations, including in multiple warehouses and stock rooms, on multiple production floors, in-transit on vehicles, and on construction and other field sites.
14. With the licensing of additional modules, the JMITS system can perform as a fully functional Manufacturing Execution System (MES) integrated with a fully functional Warehouse Management System (WMS).

**For more information**

Please see [www.BellHawk.com](http://www.BellHawk.com) for more details.