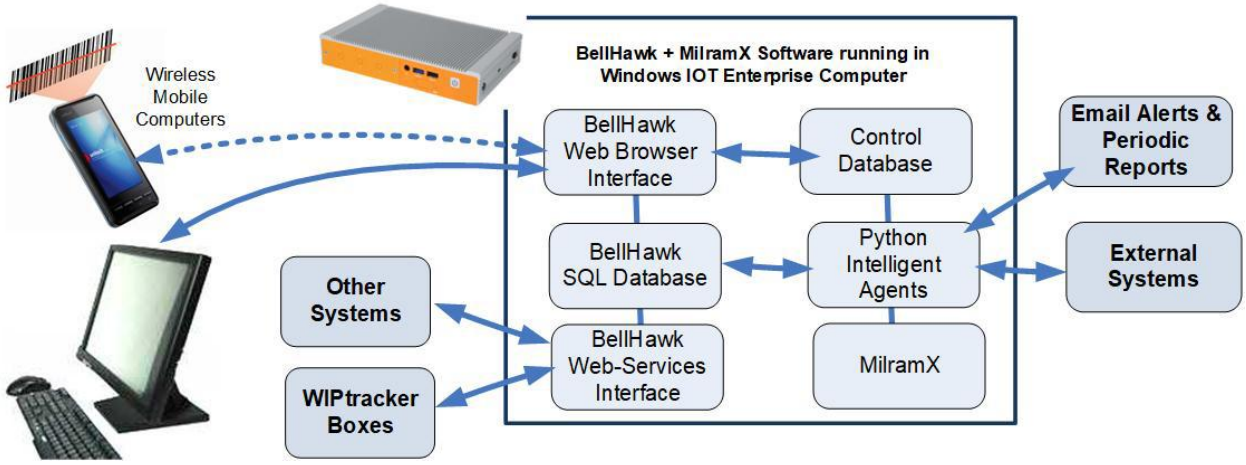
Inside WIPtracker™



WIPtracker is an integrated work-in-process, warehouse management, materials tracking and traceability manufacturing execution system that runs on a small ruggedized Windows IOT enterprise based industrial computer. It comes with all the needed software pre-installed, ready to plug into a local area network in a manufacturing plant or distribution warehouse and start collecting data.

WIPtracker is based upon the proven BellHawk real-time operations tracking software combined with the MilramX intelligent agent software. Over the past decade, this software been deployed in a wide variety of operations tracking applications in industries such as metal and plastics manufacturing, textiles and paper goods, defense, food and pharmaceutical processing, construction and mining.

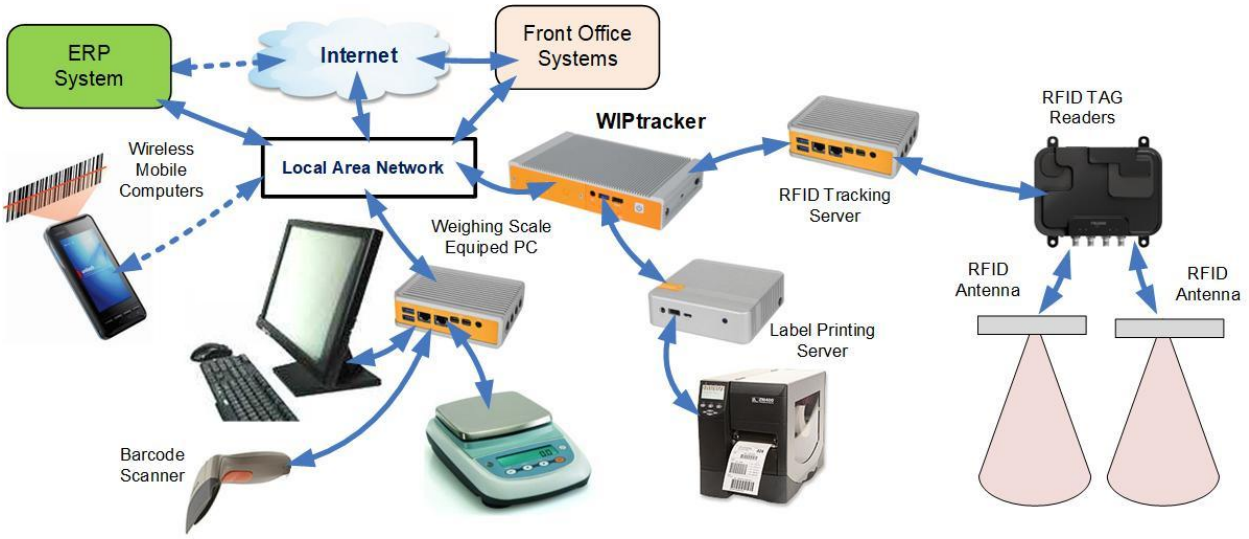
Inside the WIPtracker box are:

1. A copy of the BellHawk SQL database, where all the operational status data is captured, along with orders and operational history.
2. The BellHawk web-browser interface which supports data capture using a web-browser running on a wide variety of PCs, tablets, and wireless mobile computers, equipped with internal or external barcode scanners, to collect and report on operations tracking data.
3. A SOAP/XML encrypted Web-Services interface through which WIPtracker boxes, such as for RFID data capture, and other external systems can securely exchange data with the BellHawk database.
4. A lightweight MilramX system which supports the running of Intelligent Agent Processes (IAPs), based on the contents of the Control Database. Instantiating, scheduling, and monitoring IAPs is controlled through the BellHawk Sys Admin and user screens.
5. MilramX Lite supports the instantiation and running of IAPs written used Python scripts. These IAPs can be used to exchange data with external systems which have a REST interface as well as generating Email alerts when certain events are detected in the

 Copyright © Milramco LLC

BellHawk data. These IAPs can also be used to generate and distribute reports on a daily or weekly basis to a list of people who have subscribed for a specific report.

WIPtracker has a number of companion “boxes”, which run WIPtracker software for barcode label printing on demand, creating a weighing scale station, or automatically monitoring movement of materials using RFID tags. These all communicate with WIPtracker through the BellHawk web-services interface.



It is intended that, as standard, that all data capture devices will all communicate over the plant or warehouse LAN for security and reliability purposes. This is so that operations can continue if the Internet goes down. But, where needed the WIPtracker box can be accessed over the Internet by its companion IOT boxes, provided that the network and internet firewall are setup so that the WIPtracker box has a fixed external IP address, which is otherwise not required.

Likewise, the WIPtracker web-services interface is intended for communications with local systems but again, can be used over the Internet to remotely access the BellHawk database provided that the WIPtracker box has a fixed IP address.

Inside the Box is a Windows 11 LTSC IOT Enterprise Operating System for which Microsoft has guaranteed at least 10 years of support. More important, Microsoft will not automatically update this operating system and possibly crash the system in the middle of a day’s production. Also, this is just the operating system minus all the performance sapping apps with which Microsoft burdens its regular Windows users.

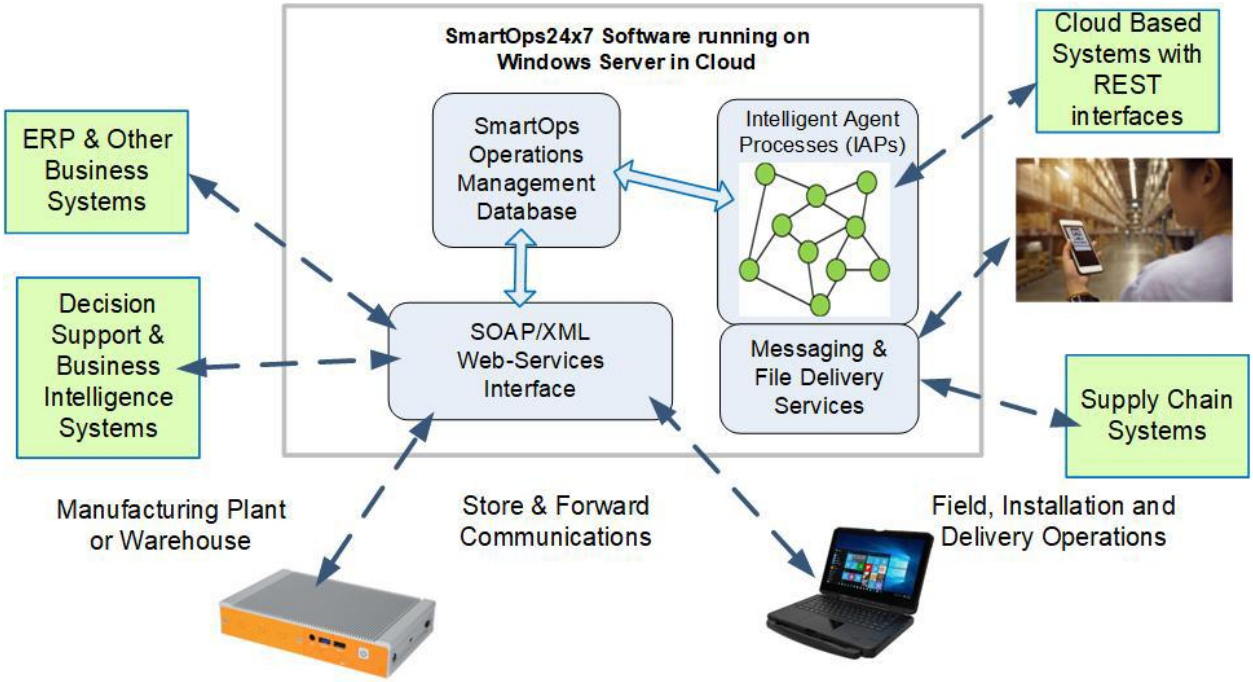
On top of this, WIPtracker runs IIS, which is a very efficient web server, and Windows SQL server, both of which are capable of making use of multi-core processors to make sure that response time to barcode scans and the like is are kept down to about one second, even when there are multiple users.

As standard, we ship WIPtracker with a 6 Core processor which will, under normal circumstances, support about 8 people doing barcode scanning, including database lookups to check for errors, at the same time. For clients with many users, we increase the processor speed and the number of cores to make sure that everyone experiences quick system response.

 Copyright © Milramco LLC

In our experience, shop-floor employees and material handlers get very annoyed if they have to wait more than a second or two for the system to respond. For this reason, we place compute-heavy tasks, such as printing out barcode labels and scanning RFID tags, which could interfere with this response time, into separate IOT computers.

This is the same reason why we run each plant or warehouse on its own IOT computer, rather than trying to get good response time from a server in the Cloud that is shared between many users. This also serves to increase the reliability, with each site having its own computer without relying on the availability of the Internet to run production or distribution activities.



When multiple WIPtracker sites need to communicate with a single ERP system, this can be achieved through the SmartOps24x7 software running on a Windows Server in the Cloud. Here the WIPtracker boxes communicate with an integrated Smart Operations Management SmartOps) database through the Web Services interface of SmartOps24x7.

This same Web Services interface can be used by ERP and other business systems to exchange data with the SmartOps database or data can be exchanged using Python based Intelligent Agent Processes (IAPs).

WIPtracker uses store and forward communications to communicate with SmartOps24x7 enabling the use of intermittent and unreliable Internet communications links. This is carried to an extreme when the WIPtracker software is installed on ruggedized Windows computers, enabling data to be collected in the field, at construction sites, and other locations with no internet communications. In this case WIPtracker automatically syncs up with SmartOps24x7 when Internet communications is reestablished, to download orders and upload operational tracking data.

For more information, please see www.WIPtracker.com and www.SmartOps24x7.com.

 Copyright © Milramco LLC