



# Binventory v5.4.9

OPERATING INSTRUCTIONS  
PLEASE READ CAREFULLY

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## 1 Introduction

Bininventory v5.4 (formerly eBob) is designed to intelligently manage inventory in any number of vessels equipped with most BinMaster continuous level sensors. Bininventory can manage any shape and size of vessel and even supports averaging of some sensor types.

The main screen of Bininventory Workstation shown in Figure 1 provides a table of vessels, each represented by a panel, providing visual and detailed level indication. The main screen can display 16 vessels (panels) at a time with tabs along the bottom for quickly switching to view more vessels. There is also a menu system along the top that provides access to configuration screens for vessel setup, site setup, scheduling, alarms, email alerts and more.

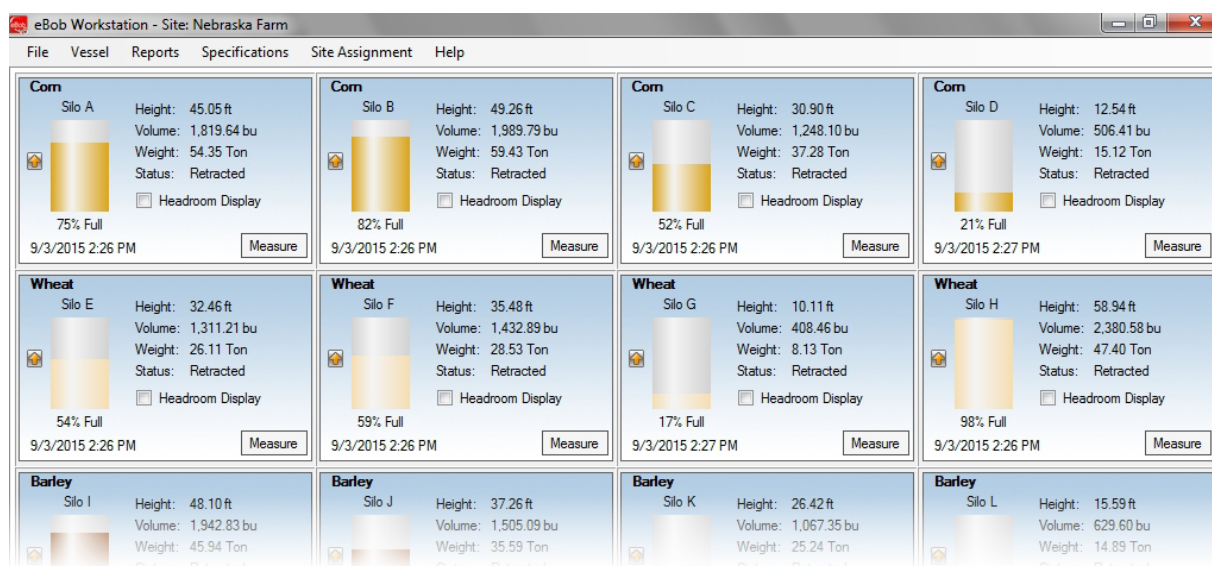


Figure 1

### 1.1 Terminology

Following is some terminology you should get familiar with before continuing with the manual:

**Site** – This refers to a location of vessels and sensors being managed by a single PC running a set of Bininventory Engine and Scheduler services. A single farm or plant may consist of one or more sites, but a Bininventory system can support any number of sites.

**SmartBob** – This may refer to the original SmartBob, the SmartBob-II or the SmartBob-TS1 level sensor from BinMaster. In most cases, Bininventory works the same with each of these, so they are collectively referred to as a SmartBob.



**Sensor Network** – This refers to the communications channel used to communicate with the sensors. Each sensor network must have compatible sensors installed on it, but each site can support multiple sensor networks. A sensor network usually consists of RS-485 cable (commonly called blue-hose), but may also consist of wireless modems or a combination of the two. The sensor network can also be transferred over an IP-based network using remote serial devices or serial device servers.

**Remote Serial Servers** – These devices allow you to extend the sensor network over an IP-based network, whether it's Ethernet or Wi-Fi. These may also be known as a serial device server, device server, serial server, serial-to-Ethernet adapter or serial-to-Wi-Fi adapter. Bininventory is directly compatible with types that act as a TCP server.

## 2 Overview of Bininventory

A full installation of Bininventory consists of three primary components. All three can exist on a single PC or they can be separated across a local area network (LAN) on multiple PC's.

1. **Workstation** – This provides the user interface for Bininventory. It is what you will use to view vessels,



product levels, configure the system and create reports. See Figure 1. It runs like most Windows programs. You double-click an icon on your desktop or click an icon in your Windows start menu, and it opens a window for you to interface with, using a mouse and keyboard. There can be one or more Workstations in a Bininventory system. Refer to section **5 The Workstation** for details.

2. **Engine and Scheduler Services** – These are two separate services or programs that continuously run



in the background as long as the PC is booted. They are not visible like the Workstation. These services start to run as soon as the PC starts up and continue to run even if a user is not logged into Windows. These services handle communications with the sensors, manage measurement schedules and provide email delivery of level alerts, to name a few. Each site of vessels requires an installed and running set of Engine and Scheduler services, and there can be any number of sites per Bininventory system.

3. **SQL Server Database** – The database is where all Bininventory configuration data and measurement



history gets stored and is hosted by a running instance of Microsoft's SQL Server 2014 Express. There is only one database needed for a single Bininventory system, and it can support virtually any number of sites, vessels and measurement records.

As a basic user of Bininventory you mostly need to understand the Workstation and how to use it. As an installer or administrator of a Bininventory system, you should understand all components and how they work together.

As an administrator, you may have to use Bininventory Administrator at installation. This small program is



used to configure the connection to the SQL server database and setup site assignments to the Engine and Scheduler services. Refer to section **6 Bininventory Administrator** for details.

### 3 Minimum System Requirements

Following are the minimum PC requirements for a full installation of Bininventory v5.4.9. Bininventory v5.4.9 cannot be guaranteed to perform or work properly if not installed on a Windows PC that meets these requirements.

- Windows 11, Windows Server 2022, Windows Server 2019
- Windows 10, Windows Server 2016, Windows 8.1, Windows Server 2012 R2, Windows 8, Windows Server 2012, Windows 7 SP1 or Windows 2008 R2
- Microsoft .NET Framework 3.5 SP1\*
- Microsoft .NET Framework 4.0\*
- 1.4 GHz (x64) or 1.0 GHz (x86) Processor (2.0 GHz or higher is recommended)
- 4 GB of system RAM
- 7 GB of available hard-disk space
- Super VGA 800 x 600 Monitor (1024 x 768 or better is recommended)
- Mouse and keyboard
- An available USB port for the installation media (USB flash/thumb drive)
- At least one communications interface for the sensor network:
  - o an RS-232 serial port plus RS232-to-RS485 interface,
  - o a USB port plus a USB-to-Serial adaptor, or
  - o a network connection plus a Serial Device Server

Additional requirements that may be needed:

- If installing a networked Bininventory system, each PC must have a network connection to the same IP-based local area network (LAN).
- If needing to send email alerts, a network or internet connection is required with access to an SMTP email server.

*\*The Bininventory installation media will detect the absence of any needed Microsoft .NET Frameworks*



## 4 Installation

Before installing the software, it is important to understand the different types of Binventory systems and the installations used to set them up.

### 4.1 System Types

There are two types of Binventory systems that can be installed and setup: single stand-alone and networked.

A single stand-alone system is where all Binventory components are installed on a single PC. It is the easiest type to install and configure, but is only accessible on that PC.

A networked system is where the Binventory components are installed on multiple PC's residing on a private local area network (LAN). It is more complicated to install and configure, but can support virtually any number of sites and remote stations. The network might all be contained within a single office building or it might be extended between office buildings through a virtual private network (VPN). The database could be installed on a server at a corporate office with one set of Binventory services installed at one plant (site 1) and another set of Binventory services installed at a second plant (site 2). Then, Workstations can be installed at numerous locations for workers and managers to monitor inventory at both sites 1 and 2.

### 4.2 Installation Setup Types

After running the Binventory setup application on the USB Flash drive, you will be presented with two installation or setup types: Easy and Advanced. Selecting Easy installs all components. Selecting Advanced will prompt you to select which components to install.

If either of the following two statements is true, you can use the Easy setup. If not, you must use the Advanced setup.

- You are installing for a single stand-alone system
- You are installing for a networked system and the current installation or setup is going to host both the SQL database and a set of Binventory services. Note that for all other installations in this networked system you will have to use Advanced setup.

### 4.3 Quick Installation and Setup

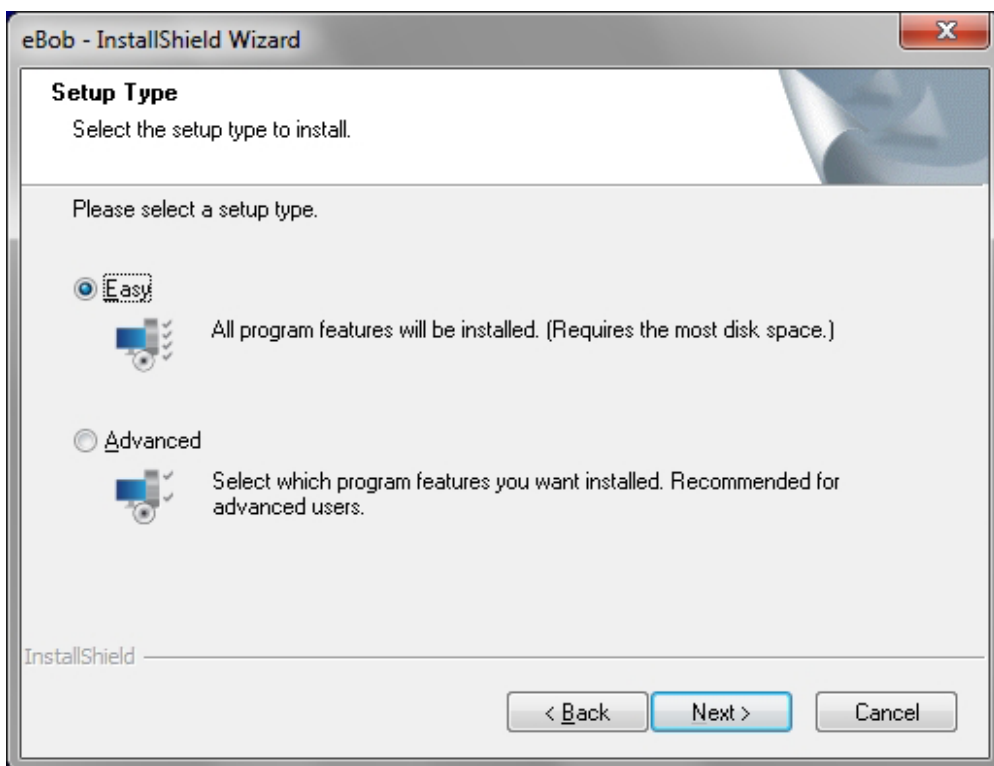
This section is for installing the Binventory software and configuring vessels for a single stand-alone system using the Easy setup. If you need to install a networked Binventory system, then go to section

### 4.4 Network Installation and Setup.

1. Verify that the target PC meets the minimum system requirements listed earlier in this manual.
2. Log in to Windows as an administrator. Installation of Binventory will fail if you are not logged in as an administrator.



3. Insert the USB Flash drive (with Bininventory software) into an available USB port. Locate the Bininventory Setup file and run it.
4. Follow the on-screen instructions and select the Easy option when prompted for the setup type. See Figure 2.



**Figure 2**

5. Once the installation is finished, double-click the Bininventory Workstation icon found on the desktop.
6. Set up a sensor network for the type of sensors being used.
  - a. Click on Sensor Networks under the Specifications menu.
  - b. Click on Add New.
  - c. From within Sensor Network Setup,
  - d. Click on Save to save the new sensor network and close Sensor Network Setup.
  - e. Click on Close in Sensor Networks.
7. Click on Vessel Maintenance in the Vessel menu.
8. From within Vessel Maintenance, click on Add New.

9. From within Vessel Setup, enter the parameters for your first vessel:
  - a. Under the Display tab, enter a name for the vessel, choose a fill color for this vessel and select the volume and weight units for displayed measurements.
  - b. Under the Type/Shape tab, select the vessel type and then enter the vessel dimensions and parameters.
  - c. Under the Contents tab, enter the product or material contained within the vessel and, if needed, its density or specific gravity.
  - d. Under the Sensor tab, select the sensor type, check Enable and enter the sensor address.
  - e. Configure any other settings that may be needed or desired.
  - f. Click Save to create the new vessel.
10. From within Vessel Maintenance, create additional vessels. If the next vessel is similar to the last one created, highlight it and click the Add New Using button. This will open up Vessel Setup with a copy of the selected vessel. You will need to change, at minimum, the vessel name and the address of the sensor.
11. After creation of your vessels, you can sort them in any order desired by using the Sort by Name, Sort by Contents, Move Up and Move Down buttons found in the Vessel Maintenance window.
12. When all vessels are created and sorted, close the Vessel Maintenance window. The Workstation will now update and display the vessels created, each in its own panel or control window.
13. If your sensors are installed, powered and connected to the PC's serial port, click the Measure button on a vessel to confirm.
14. For more setup and configuration, such as level alerts or measurement schedules go to section **5.4 Configuration, Setup and Features.**

## 4.4 Network Installation and Setup

This section is a guide for installing the Bininventory software on a network and configuring for multiple sites of vessels.

### 4.4.1 Step 1 – Preparation for Network Installation

The first step with a network installation is planning and preparation. Determine which PC's are going to be used in the system. Each PC used will need to have network access and each PC hosting a site will need to have an available serial port and be located relatively close to the vessels. Make a list of the PC's and include with each; the computer name or its static IP address, the type of installation (see list), the COM port (if hosting a site of vessels) and the administrator's username and password.

There are four types of installations that you may have to perform to set up a networked system:

1. **Database** – This is when you will install the SQL database and the Workstation to a single PC or server. Typically, this type of installation is on a server. There can only be one database per Bininventory system.
2. **Database with Site** – This is when you will install everything (SQL database, Engine/Scheduler services and Workstation) to a single PC. There can only be one database per Bininventory system.
3. **Site** – This will install the Engine/Scheduler services and the Workstation. There should only be one of these installed for each site of vessels, but you can have any number of sites per networked Bininventory system.
4. **Remote Workstation** – This will install only the Workstation, and there can be any number of these installed across the network.

#### 4.4.2 Step 2 – Database Installation

The first software installation should be on the PC or server that is hosting the SQL database.

Follow the steps in section **4.4.5 Software Installation using Advanced Setup** to perform either a Database installation or a Database with Site installation.

#### 4.4.3 Step 3 – Bininventory Setup

1. Using Bininventory Workstation on the PC hosting the database, set up all required sites for your system. Refer to section **5.4.2 Site Maintenance and Setup** for details.
2. Optionally, at this time, you can switch between each site and set up all required vessels for each site. Refer to sections **5.4.6 Vessel Maintenance** and **5.4.7 Vessel Setup** for details. If not done now, you can do this in **4.4.4 Step 4 – Site Installation**.

#### 4.4.4 Step 4 – Site Installation

Perform the following on each PC that is going to host a site:

1. Follow the steps in section **4.4.5 Software Installation using Advanced Setup** to perform a Site installation.

2. Follow the steps in section **6 Bininventory Administrator** to create a connection to the database and properly set the site assignments.
3. If vessels were not previously set up in **4.4.3 Step 3 – Bininventory Setup**, then open up Bininventory Workstation and set up the required vessels for this site. Refer to section **5.4.6 Vessel Maintenance** and **5.4.7 Vessel Setup** for details.

#### 4.4.5 Software Installation using Advanced Setup

Follow these steps for installing the Bininventory software using the Advanced Setup:

1. Verify that the target PC meets the minimum system requirements listed earlier in this manual.
2. Login into Windows as an administrator. Installation of Bininventory 5 will fail if you are not logged in as an administrator.
3. Insert the USB Flash drive (with Bininventory software) into an available USB port. Locate the Bininventory Setup file and run it.
4. Follow the on-screen instructions and select the Advanced option when prompted for the setup type, as shown in Figure 3.

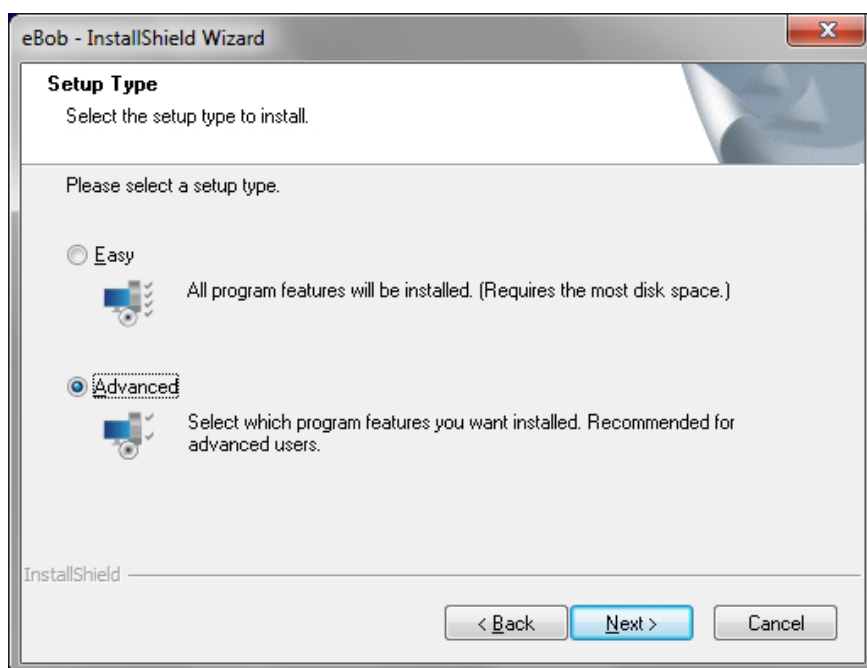


Figure 3

5. When prompted to choose the destination location, it is recommended to leave it set at the default.
6. The next screen will prompt you to select the features or BinInventory components to install. Be sure that the Application is always checked.
  - a. If this installation is for a Database, check Application and SQL Database as shown in Figure 4.

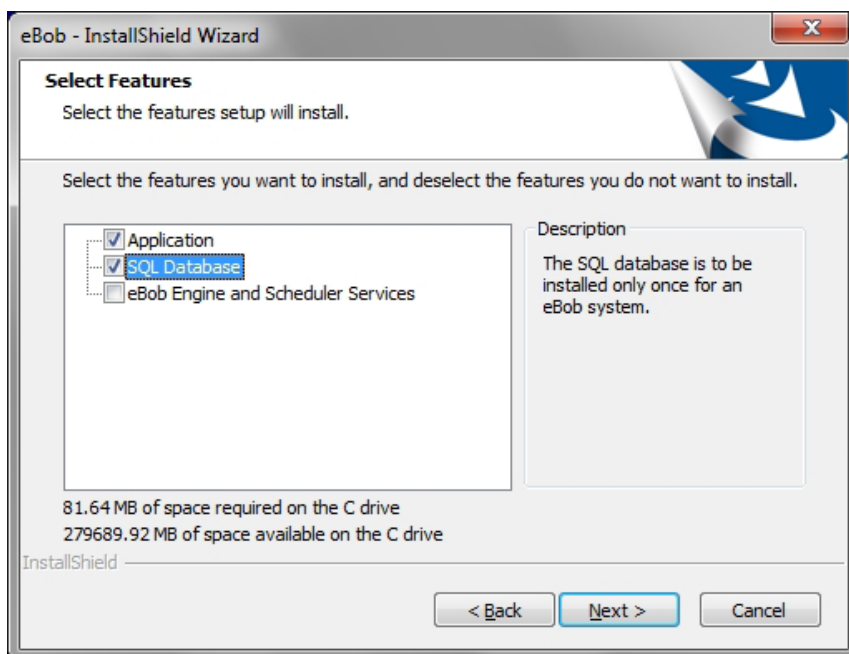


Figure 4

- b. If this installation is for a Database with Site, check all features as shown in Figure 5.

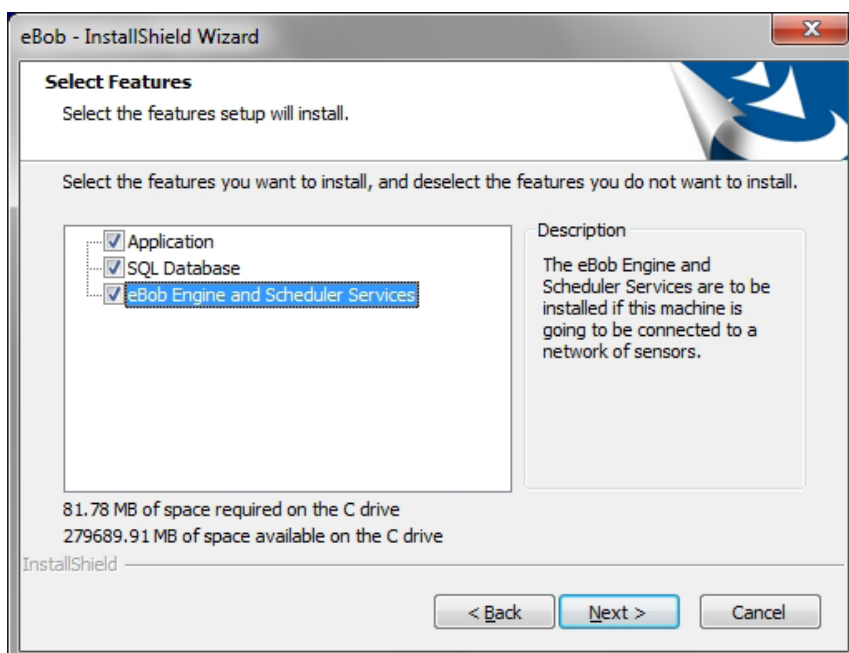


Figure 5

- c. If this installation is for a Site, check Application and also Engine and Scheduler Services as shown in Figure 6.

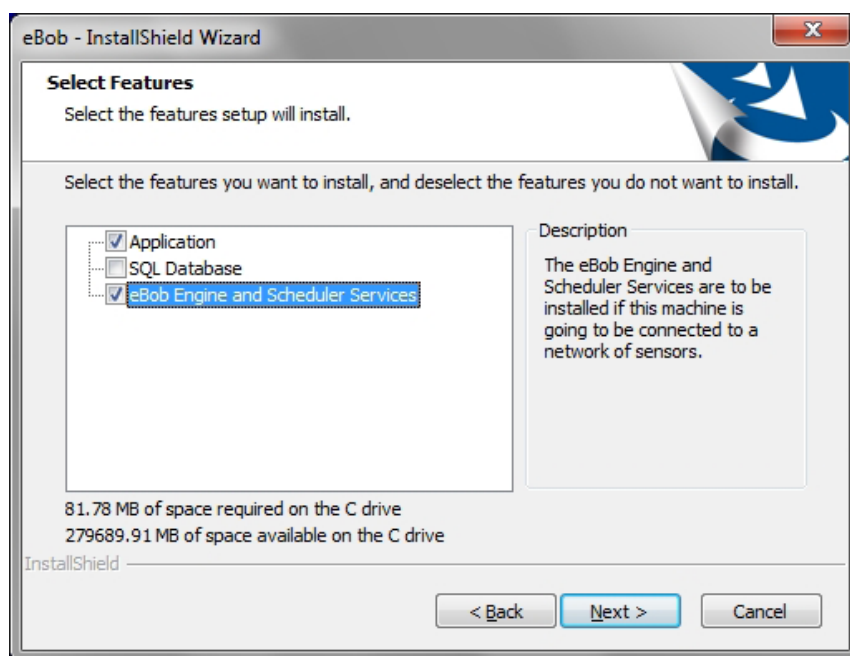


Figure 6

- d. If this installation is for a Remote Workstation, check only the Application as shown in Figure 7.

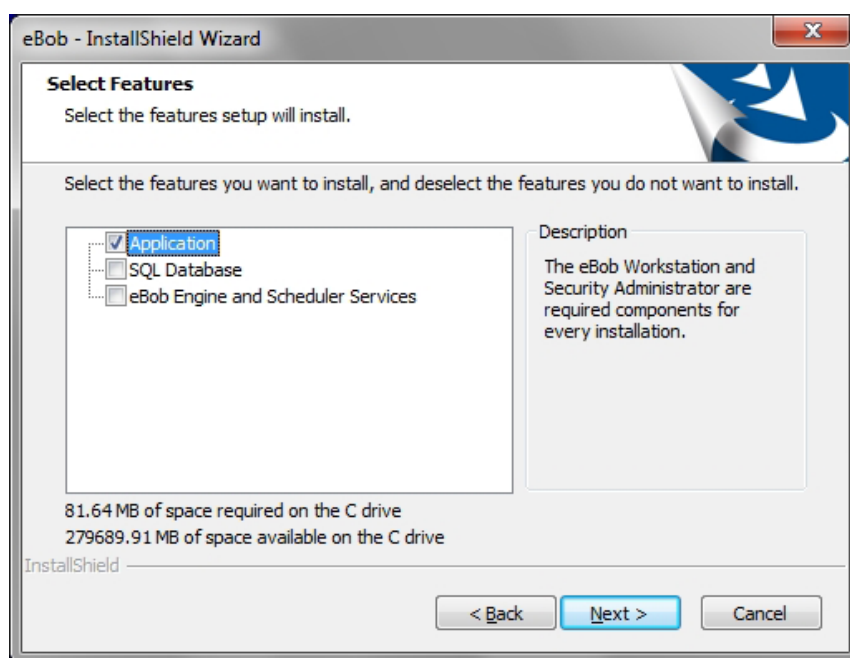


Figure 7

7. Wait for the software installation to complete and click Finish when prompted.

#### 4.4.6 Configure SQL Server for Remote Connections

The following steps are for configuring SQL server to allow for remote connections. This is now automatically handled by the Binventory installation media and is only here for reference. If doing this, it must be done on the PC hosting the SQL Server database and you will need administrative privileges.

1. Go to the Windows start menu, select Microsoft SQL Server 2014 under Programs, then Configuration Tools and finally SQL Server 2014 Configuration Manager.
2. From within SQL Server 2014 Configuration Manager, expand SQL Server Network Configuration in the left pane, locate and click on Protocols for EBOB.
3. In the right pane, right-click on Named Pipes and select Enable. Confirm the change.
4. Also in the right pane, right-click on TCP/IP and select Enable. Confirm the change.
5. Close the SQL Server 2014 Configuration Manager.
6. Either restart the SQL Server (EBOB) instance or reboot the PC hosting the database. If restarting the instance only, you must first stop the Engine and Scheduler services prior to restarting the SQL Server. Then, restart the Engine and Scheduler services after restarting the SQL Server.

#### 4.4.7 Windows Firewall Configuration

The following two sections describe how to setup firewall rules for networked systems. This is now automatically handled by the Binventory installation media and is only here for reference.



#### 4.4.7.1 Windows 10 Firewall Rules for SQL Server and SQL Browser

Follow these steps to create firewall rule to allow incoming connections to SQL Server (EBOB):

1. Log on, as an administrator, to the PC hosting the Bininventory SQL database.
2. Go to Windows Defender Firewall and Advanced Security.
3. In the left pane, click on Inbound Rules.
4. In the right pane, click on New Rule.
5. For rule type, select Program and click Next.
6. Select "This program path", browse to "sqlservr.exe" that corresponds with the EBOB server instance and click Next. The path may be as follows: "C:\Program Files (x86)\Microsoft SQL Server\MSSQL.x\MSSQL\Binn\sqlservr.exe".
7. Select "Allow the connection" and click Next.
8. Select Domain, Private and/or Public as needed and click Next. Normally, Bininventory systems are limited to a single network; so, selecting Domain or Private would be preferred.
9. Set the name to "SQL Server (EBOB)" and click Finish.

...continue by creating a firewall rule to allow incoming connections to SQL Server Browser:

10. In the right pane (under Actions), click on New Rule.
11. Select Port and click Next.
12. Select UDP, set Specific local ports to 1434 and click Next.
13. Select "Allow the connection" and click Next.
14. Select Domain, Private and/or Public as needed and click Next.
15. Set the name to "SQL Server Browser" and click Finish.


#### 4.4.7.2 Windows 10 Firewall Rule for Bininventory Engine Service

Follow these steps to create a firewall rule in Windows to allow incoming connections to the Bininventory Engine service:

1. Log on, as an administrator, to the PC hosting the Bininventory Engine service.
2. Go to Windows Defender Firewall and Advanced Security.
3. In the left pane, click on Inbound Rules.
4. In the right pane, click on New Rule.
5. Select Port and click Next.
6. Select TCP, set Specific local ports to 8093 and click Next.
7. Select "Allow the connection" and click Next.
8. Select Domain, Private and/or Public as needed and click Next.
9. Set the name to "Bininventory Engine Service" and click Finish.

## 5 The Workstation

This section is intended to help you get familiar with the Binventory Workstation and where to go to configure or access something.

Open the Workstation by clicking on Binventory Workstation under eBob in the Windows start menu or  by double-clicking the Binventory Workstation icon found on your desktop. When you first open the Workstation, it will mostly be blank because no vessels have been configured, but if you look at Figure 10 below, you will see all the components of the main screen. At the top of the application is the title bar, and it will indicate the site currently assigned to the Workstation. In this case, the assigned site is Nebraska Farm. Below the title bar is a menu bar, which is detailed later in this section. Below the title bar and consuming the majority of the screen is a table of vessels, all located at site Nebraska Farm and managed by its set of Binventory services. On the left and below the table of vessels is a row of tabs for viewing additional pages of vessels.

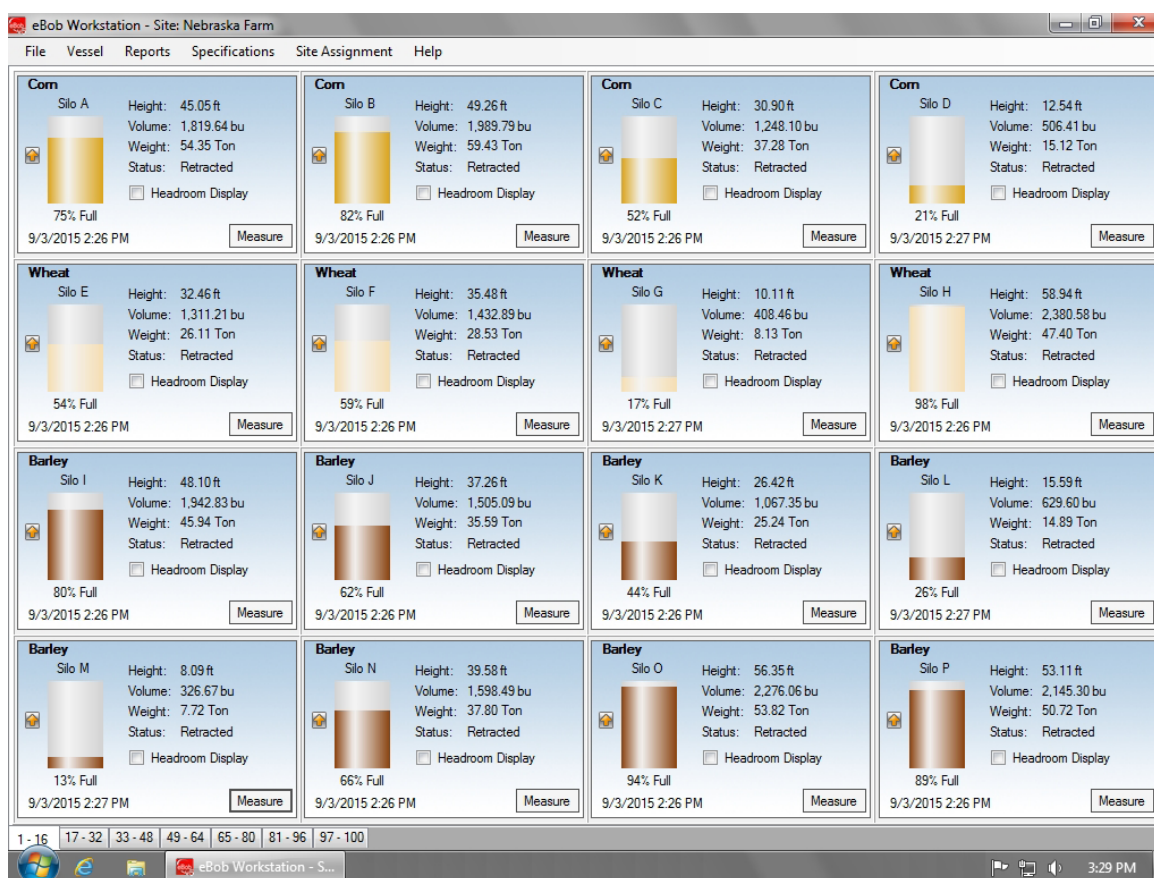


Figure 10

The Workstation supports connection to one site at a time, so you can have up to 255 vessels available for viewing or for control at any time. To switch to a different site, select the desired site from the Site Assignment menu in the main menu bar. The Workstation will restart and you will be connected to and viewing vessels at that site.

## 5.1 Navigating the Menu System

This section is only to help you get familiar with the menu system. For details on how to use the features found in the menu system go to **5.4 Configuration, Setup and Features**.

The menu bar consists of five menus: File, Vessel, Reports, Specifications, Site Assignment and Help. They are available to all Bininventory users, except the Specifications menu. This menu and a few items under the File menu are only available if you are logged into Bininventory as an Administrator User.

### 5.1.1 File Menu

**Login** – Select this to login to the Workstation if it is configured to require logging in. This menu item will only be available if you are logged out.

**Logoff** – Select this to logoff or out of the Workstation. This menu item will only be available if you are logged in.

**Change Password** – Select this to change your Workstation login password. This menu item will only be available if the Workstation is configured to require login and you are currently logged in as a System User.

**User Maintenance** – Select this to access the user maintenance window where you can add, delete or edit users for access to the Workstation. This menu item will only be available if you are logged in as an Administrator User.

**System Export** – Select this to export the system from the database to a compressed data file. This menu item will only be available if you are logged in as an Administrator User.

**System Import** – Select this to import a system from a compressed data file. This menu item will only be available if you are logged in as an Administrator User.

**Exit** – Select this to logoff and exit the Workstation.

### 5.1.2 Vessel Menu

**Vessel Maintenance** – Select this to access the vessel maintenance window where you can add, delete, edit, sort or review vessels and their configuration. This menu item will be available to all users, but you must be logged in as a System User or Administrator User to add, delete, edit or sort vessels.

**Vessel Group Maintenance** – Select this to access the vessel group maintenance window where you can add, delete, edit or review vessels and their configuration. This menu item will be available to all users, but you must be logged in as a System User or Administrator User to add, delete or edit groups.

**Schedule Maintenance** – Select this to access the scheduler maintenance window where you can add, delete, edit or review measurement schedules. This menu item will be available to all users, but you must be logged in as a System User or Administrator User to add, delete or edit measurement schedules.

**Temporary Group Setup** – Select this to access a window where you can temporarily show or hide vessels from the main screen and reorder them. This menu item is available to all users.

**Measure All Vessels** – Select this to initiate a measurement with all vessels that are currently available on the main screen. If you have a temporary group setup that hides some vessels, the hidden vessels will NOT be included. This menu item is available to all users.

### 5.1.3 Reports Menu

**Print Reports** – Select this to view and print reports or export data.

**Email Reports** – Select this to access a menu of reports that can be scheduled to be sent via email. There is one option available, called Site Status report.

### 5.1.4 Specifications Menu

The entire Specifications menu is only available if you are logged in as an Administrator User.

**Contact Maintenance** – Select this to access the contact maintenance window where you can add, delete or edit contacts for receiving emails.

**Site Maintenance** – Select this to access the site maintenance window where you can add, delete or edit vessel sites.

**Sensor Networks** – Select this to access a window where you can add, delete or edit sensor networks for the currently assigned site.

**Email Setup** – Select this to setup an SMTP email server and provide support for sending emails.

**System Setup** – Select this for a few system-wide settings and to set up information about the organization that owns and manages the Bininventory system.

### 5.1.5 Site Assignment

The Site Assignment menu consists of all sites that are set up in the system and allows the user to easily select and switch the Workstation to a different site.

### 5.1.6 Help Menu

**Operator's Manual** – Select this to access the Bininventory operator's manual in Acrobat PDF format. This requires that you have Adobe Reader or Acrobat installed on the PC.

**About Bininventory Workstation** – Select this to access version and copyright information

## 5.2 Vessel Control and Tabs

Each vessel that is set up in the system is represented by a vessel panel found on the main screen of the Workstation. This panel provides a multitude of information and control for each vessel and its sensors. See Figure 11 for everything that is available. Some of the key things to note are the name of the vessel, name or description of the vessel contents, product and headroom levels as height, volume and weight, visual indication of the vessel level and a button to take a new measurement.

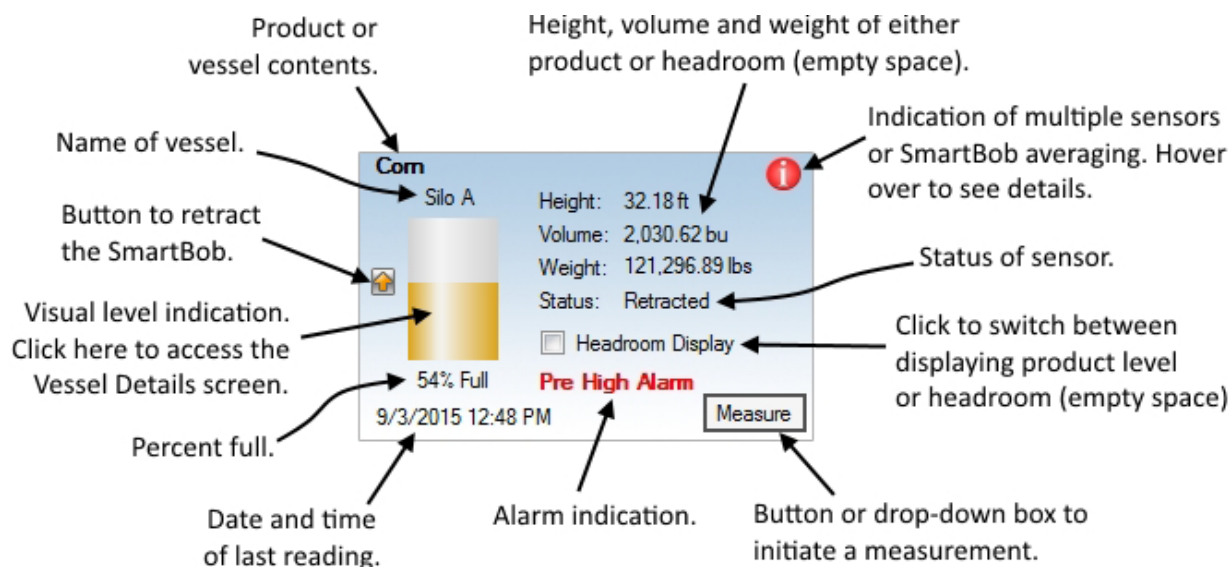


Figure 11

By default, the Headroom Display checkbox is un-checked and the product level for Height, Volume and Weight are being displayed. When the Headroom Display checkbox is checked, the empty space or available storage space is being displayed for Height, Volume and Weight.

The status field in the vessel control generally refers to the sensor mounted on the vessel but can also indicate something else. Following is a list of the more common results for this field and their meaning:

1. **Unknown** – The status of the sensor is not known. The sensor has not taken a measurement since the last time the PC was rebooted or the Bininventory Engine was restarted.
2. **Pending** – A measurement has been requested and status of the measurement request has not yet been determined.
3. **Descending** – A SmartBob is performing a measurement and is currently dropping its bob.
4. **Retracting** – A SmartBob is performing a measurement and is currently raising its bob.

5. **Ready** – The sensors last measurement attempt was successful. It is currently idle and ready to take another measurement.
6. **Bob In Override** – A SmartBob's last measurement attempt was ignored due to its override input being active or open circuit. Refer to the SmartBob operator's manual for more details.
7. **Communications Error** – The last measurement attempt has failed due to Bininventory not receiving the proper communications response from the sensor. This is usually due to RS-485 wiring but can be related to software setup or hardware configuration.
8. **Bob Stuck Top** – The last measurement attempt has failed due to the SmartBob failing to drop its bob. This may be due to a very full vessel but can also be due to a mechanical failure in the SmartBob.
9. **Bob Stuck Bottom** – The last measurement attempt has failed due to the SmartBob failing to completely retract its bob. This could be due to the bob getting buried in product but can also be due to a mechanical failure in the SmartBob.
10. **Database Read Only** – The Workstation is connected to the database and showing existing data, but it cannot be used to initiate measurements. This may mean that the Bininventory Engine service for the currently assigned site is not running or, if this is a remote Workstation, then the IP address to the Engine service host is not properly set in Site Setup.
11. **Error** – One or more errors has occurred. More details are provided by hovering your mouse pointer over the Error message or by looking in Vessel Details.

### 5.3 Vessel Details

When you click on the visual level indication in a vessel control (panel), you gain access to the Vessel Details screen. This screen provides additional information not available in the vessel control on the main screen. There are two tabs of information available, the Vessel tab and the Sensor tab. The Vessel tab, as shown in Figure 12, provides additional information about the vessel, the vessel contents, product level, alarm settings and time of next measurement.



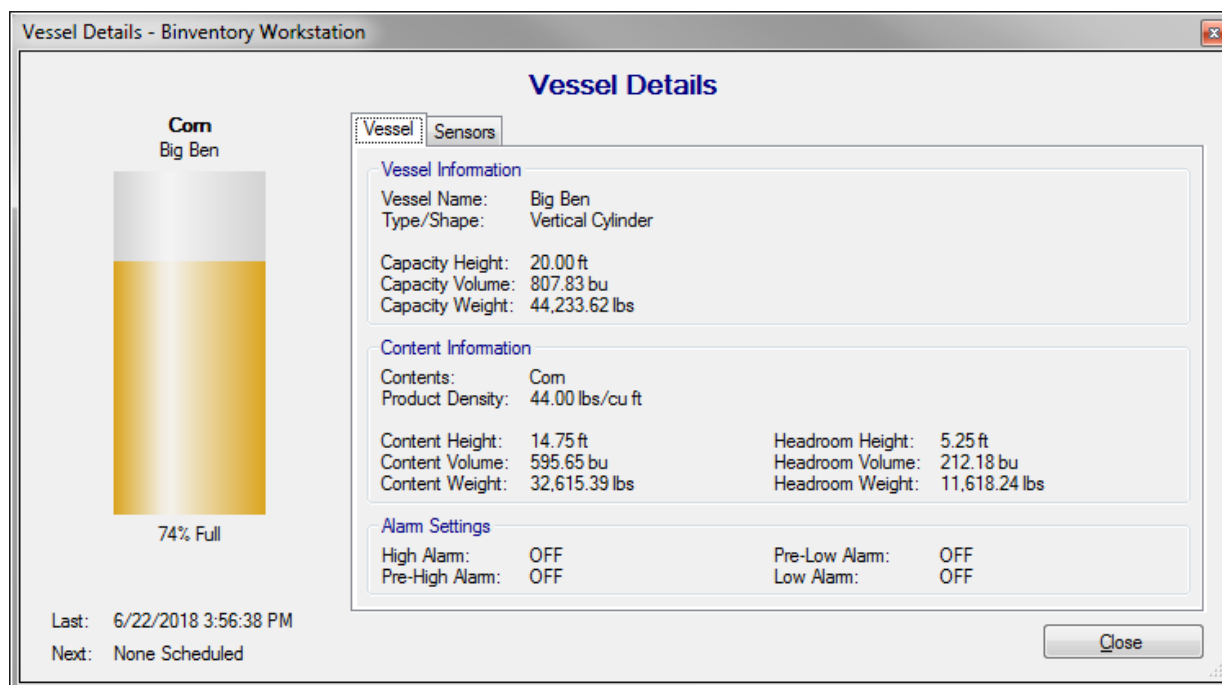


Figure 12

The sensor tab, as shown in Figure 13, provides additional information about the sensors mounted on the vessel. Both the sensor network and sensor type will be identified at the top of this tab. The remaining information, below that, will vary depending on the type of sensor. The information presented on this page may be helpful in verifying a sensors configuration and when working with BinMaster technical support.

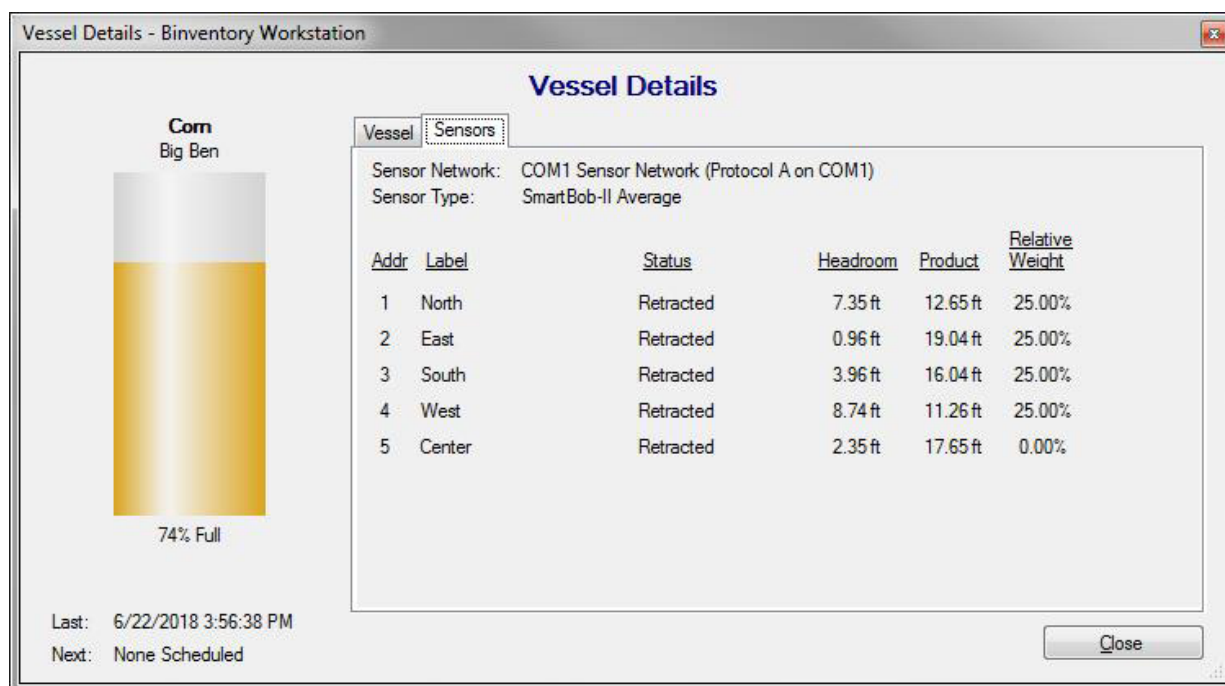


Figure 13



## 5.4 Configuration, Setup and Features

### 5.4.1 System Setup

System Setup under the Specifications menu offers two important system-wide settings and fields for entering optional information about the registered user of Bininventory. Refer to Figure 14. After making any changes to this screen, click the Save button.

**System Setup - Bininventory Workstation**

**System Setup**

**Registered User & Company**

Registered User: John McDonald

Company Name: Nebraska Farming

Street Address: 7201 North 98th Street

City/Town: Lincoln

State/Province/Region: NE

Zip/Postal Code: 68507

Country/Nation: United States

**System Options**

LDAP Server Address:

Measurement Retention Days: 728

Do NOT require users to log in: ☒

Save Cancel

**Figure 14**

**Measurement Retention Days** – This defines how long measurement data is maintained in the database. Once measurement records reach this age (in days) they will be permanently deleted. The default value is 60 days or about 2 months.

**Do NOT require users to login** – This setting controls whether users must login to use Bininventory Workstation or if anyone with access to the Windows PC can use Bininventory Workstation. The default is checked. It is recommended that after a new system is installed and set up that this setting be un-checked and users be set up with the appropriate login and privileges. Be aware that with this checked, anyone that has access to this PC has administrative privileges to the Bininventory system.

## 5.4.2 Site Maintenance and Setup

Site Maintenance under the Specifications menu is where you add, edit and delete sites. If you are setting up a networked Bininventory system, adding new sites to the system is one of the first things you will need to do. A default site, named Current Location, is included in the system for you at installation. This site can be modified to be one of your sites or you can delete it after setting up the sites you need.

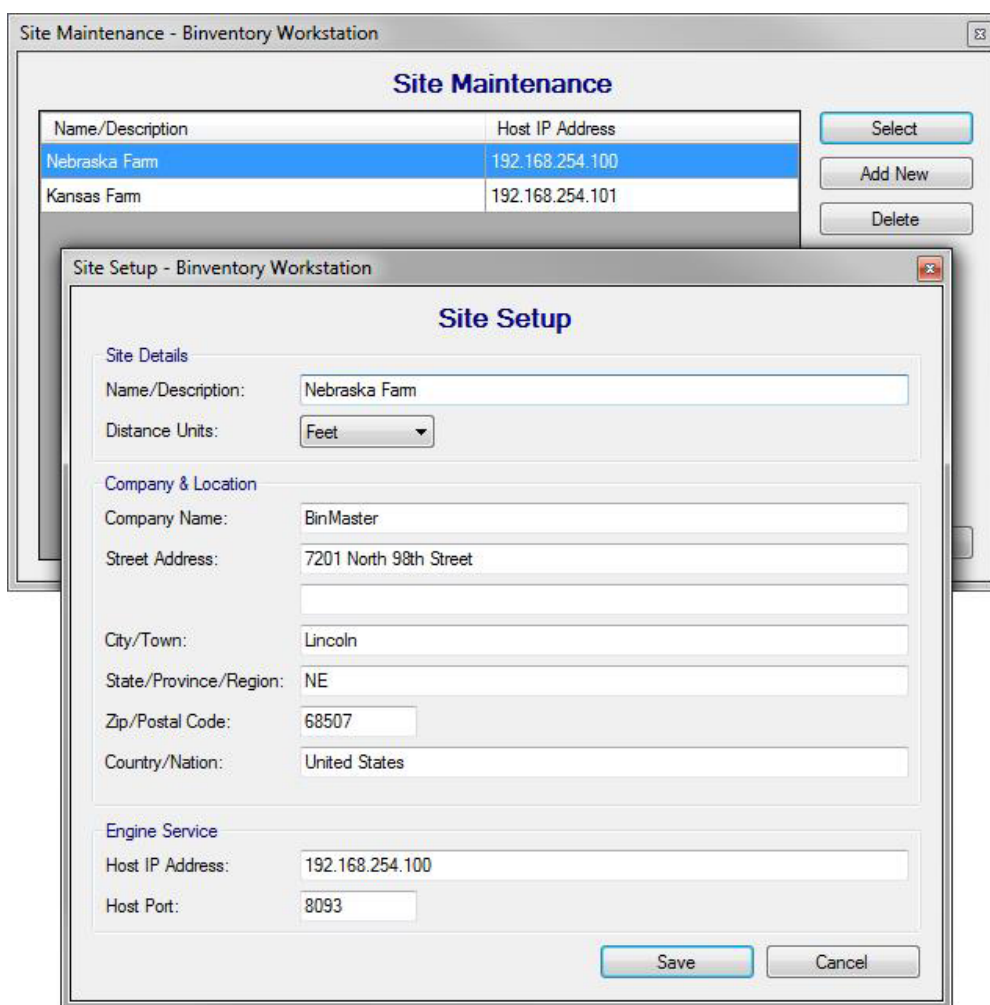


Figure 15

To define and add a new site to the system, click the Add New button from within the Site Maintenance screen. This will open the Site Setup screen with blank/default fields for you to define a new site. After entering information for this site, click the Save button. Refer to Figure 15 for an example.

**Name/Description** – This is required and should be unique and descriptive.

**Distance Units** – The default is feet and can be changed to meters, inches or centimeters. These units are used for vessel dimensions and sensor settings in Vessel Setup.

**Company & Location** – These fields are optional, but recommended if you have multiple sites.

**Host IP Address** – This identifies the host PC serving the Engine and Scheduler services for this site. The default value of 127.0.0.1 is only valid for a single stand-alone system; this must be properly set for a networked installation.

**Host Port** – The default value is 8093 and generally should not be changed.

To edit or modify an existing site, highlight it from within the Site Maintenance screen and click the Select button. This will open the Site Setup screen populated with this site's information. Make any necessary changes and click the Save button. Refer to Figure 15 for an example.

To delete an existing site, highlight it from within the Site Maintenance screen and then click the Delete button. You will be prompted to confirm the deletion of the site. You cannot delete a site if it is the currently assigned site or if it has vessels configured for it.

### 5.4.3 Email Setup

Email Setup under the Specifications menu is where you set up Bininventory to support the sending of emails. At minimum, you will need to provide the domain or server name to your networks SMTP server. Talk to your IT department or Internet service provider for this information. See Figure 16 for a typical setup.

**Email Setup - Bininventory Workstation**

**Email Setup**

☒ Enable SMTP Email Client

**SMTP Server**

Server Name:

SMTP Port:  ☐ Use a Secure Connection

**SMTP Authentication**

☐ Use SMTP Authentication

User ID:

Password:

Verify Password:

**Email Addresses**

Administrator:

Default From:

**Message Subject Line**

Administrative:

Measurement:

Alarm:

**Email Trailer**

Define a standard trailer here to append to all email messages generated by the system.

**Figure 16**

Some SMTP servers require authentication. If this is the case, you will need to check Use SMTP Authentication and enter credentials into the fields for User ID, Password and Verify Password. Again, your IT department or Internet service provider should be able to provide you with this information.

When possible, it is recommended to use the default return email addresses. If needed, you can add a trailer or message to be appended to the end of every email.

#### 5.4.4 Email Contacts

Contact Maintenance under the Specifications menu is where you add, edit or delete contacts for receiving emails. These contacts will only receive emails after they have been assigned to an Email Notification under Vessel Setup or to a Site Status Report. Refer to section **5.4.7.7 Email Notifications** for more information on vessel email notifications and section **5.4.14 Site Status Report** for more information on receiving site status reports.

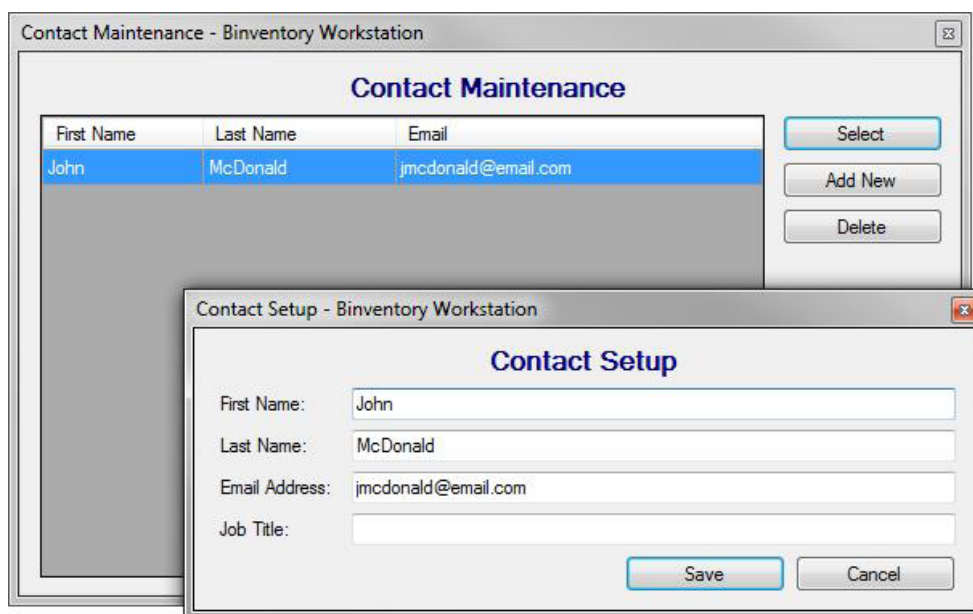


Figure 17

To create a new contact, click the Add New button from within the Contact Maintenance screen. This will open the Contact Setup screen with blank/default fields for you to define a new contact. The email address is required and the first and last names are recommended. After entering the contacts information, click the Save button. Refer to Figure 17 for an example.

To edit or modify an existing contact, highlight it from within the Contact Maintenance screen and click the Select button. This will open the Contact Setup screen populated with this contact's information. Make any necessary changes and click the Save button. Refer to Figure 17 for an example.

To delete an existing contact, highlight it from within the Contact Maintenance screen then click the Delete button. You will be prompted to confirm the deletion of the contact.

### 5.4.5 Sensor Networks

Sensor Networks under the Specifications menu is where you add, edit and delete sensor networks for the currently assigned site. Each site can have any number of sensor networks; limited only by the number of interfaces you have available on the PC hosting the site. Figure 18 shows two sensor networks set up on the currently assigned site: a SmartBob network using a serial comport and a Modbus network using a serial device server.

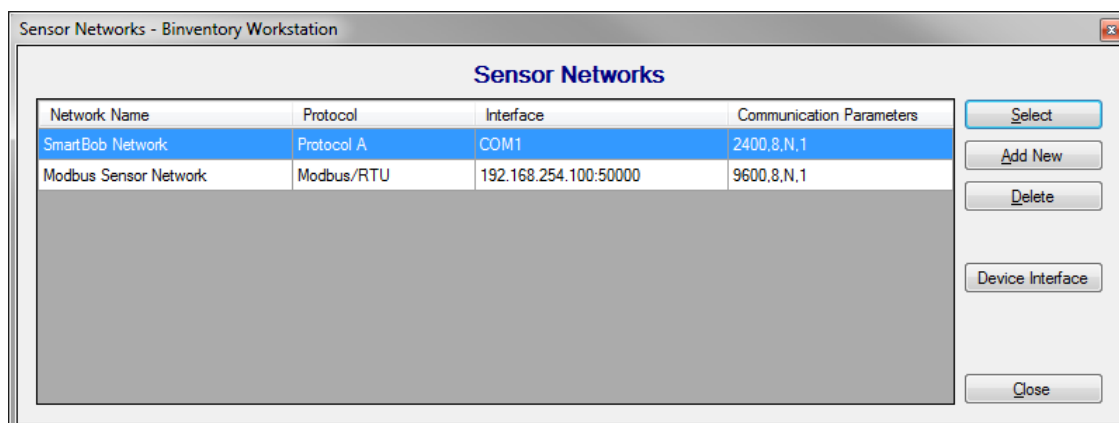


Figure 18

To define and add a new sensor network, click the Add New button. This will open the Sensor Network Setup page with blank values. Enter a unique and descriptive name for the sensor network, select the protocol to be used, select the interface used, adjust the communication parameters and click the Save button.

For some protocol types, there are advanced settings available; however, these should only be adjusted under guidance of BinMaster technical support.

**Sensor Network Setup**

Name / Description  
Modbus Sensor Network

Protocol  
Protocol used by all sensors on this network: Modbus/RTU

Interface  
☐ Local Serial Port: [SELECT]  
☒ Remote Serial Server:  
 IP Address: 192.168.254.100  
 Port Number: 50000 [Common Port Numbers](#)

Communication Parameters  
 Baud Rate: 9600 bps  
 Data Bits: 8  
 Parity: None  
 Stop Bits: 1

Advanced  
 These advanced controls should only be adjusted under the guidance of BinMaster technical support.  
 Request Attempts: 3  
 Response Timeout: 1.0

Save Cancel

Figure 19

To edit or modify an existing sensor network, highlight it in the Sensor Networks screen and then click Select. This will open the Sensor Network Setup page with the property values of that sensor network. Make the necessary changes and click the Save button.

To delete an existing sensor network, highlight it from within the Sensor Network screen and click the Delete button. You will be prompted to confirm the deletion of the sensor network.

#### 5.4.6 Vessel Maintenance

Vessel Maintenance under the Vessel menu is where you add, copy, edit, delete and sort the vessels in the currently assigned site.

To create a new vessel, click the Add New button from within the Vessel Maintenance screen. This will open a blank Vessel Setup screen for you to define a new vessel. Refer to section **5.4.7 Vessel Setup** for help on using Vessel Setup.



To copy an existing vessel, highlight the vessel you want to copy and click the Add New Using button. This will open the Vessel Setup screen populated with that vessel's properties. At minimum, you will have to change the vessel name on the Display tab and the sensor address on the Sensor tab. Make any other necessary changes and click the Save button. Refer to section **5.4.7 Vessel Setup** for help on using Vessel Setup.

To edit or modify an existing vessel, highlight it from within the Vessel Maintenance screen and click the Select button. This will open the Vessel Setup screen populated with that vessel's properties. Make any necessary changes and click the Save button. Refer to section **5.4.7 Vessel Setup** for help on using Vessel Setup.

To delete an existing vessel, highlight it from within the Vessel Maintenance screen and click the Delete button. You will be prompted to confirm the deletion of the vessel. Note that deleting a vessel also deletes all associated measurement data.

To sort the vessels, click the Sort by Name or Sort by Contents button. If these don't provide the sort order you desire, you can select a single vessel and use the Move Up or Move Down button to position it anywhere within your list of vessels. This sort order will be used on the main screen and in the reports.

### 5.4.7 Vessel Setup

The Vessel Setup screen is accessible from Vessel Maintenance and is used to enter or change a vessel's properties. Referring to Figure 20, there are six tabs or pages of settings in Vessel Setup: Display, Type/Shape, Contents, Sensor, Alarms and Email Notifications. When creating a new vessel, it is best to work through each tab as ordered, starting on the left with the Display tab. The following sections describe these tabs in more detail.



Figure 20

#### 5.4.7.1 Display Tab

The Display tab in Vessel Setup provides fields for entering the vessel name, the fill color to use for representing tank levels and the units of measure used for the display. Vessel names must be unique at each site.

### 5.4.7.2 Type/Shape Tab

BinInventory supports any shape, type and size of vessel through the use of vessel calculators or a custom lookup table. In Vessel Setup under the Type/Shape tab you can choose from the following vessel types:

- Vertical Cylinder
- Vertical Cylinder with Cone
- Vertical Cylinder with Hemispherical Heads
- Vertical Cylinder with Dished Heads
- Vertical Cylinder with Ellipsoidal Heads
- Horizontal Cylinder
- Horizontal Cylinder with Hemispherical Heads
- Horizontal Cylinder with Dished Heads
- Horizontal Cylinder with Ellipsoidal Heads
- Horizontal Cylinder with Conical Heads
- Rectangular
- Rectangular with Chute
- Vertical Oval
- Horizontal Oval
- Spherical
- Custom / Lookup Table

All choices, except for the last one (Custom / Lookup Table), are vessel calculators that will calculate the volume of the vessel based on dimensions or properties that you provide. They also calculate the volume of headroom (empty space) and product based upon the sensor measurement. The required properties vary for each vessel type/shape.

Upon selection of a type/shape (other than Custom / Lookup Table) you will be presented with a drawing of the vessel and fields for entering required properties. Dimensions in the drawing use a letter symbol for association with the required property fields. Assistance with the properties and controls is provided at the bottom of the Type/Shape tab. Simply move your mouse cursor over the property or control to get a description of what is needed. Most properties are a dimension which must be given in the measurement units specified at the top of the tab.

If your vessel is a cylinder with ASME or DIN standard heads, you can use either Vertical Cylinder with Ellipsoidal Heads or Horizontal Cylinder with Ellipsoidal Heads for a very accurate approximation. After selecting one of these types (vertical or horizontal), find the standard head type in the table below to determine what value to use for the Head Height (HH) or Head Length (HL) field.

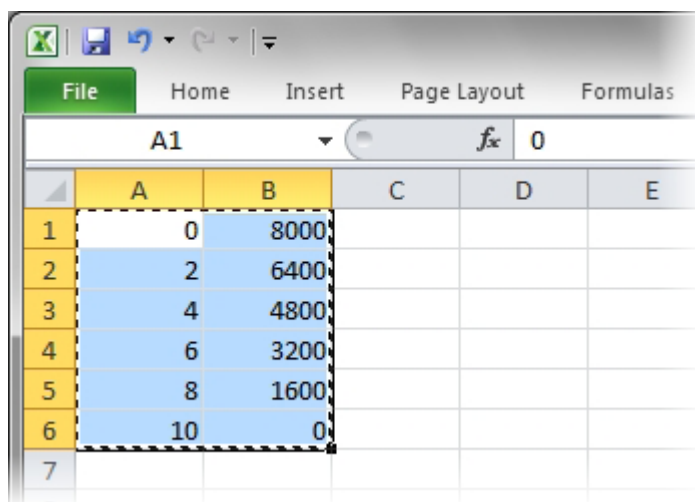
Head Type	Head Height (HH) or Head Length (HL)
ASME Flanged & Dished	Multiply diameter (D) times 0.154
ASME 80-10 F&D	Multiply diameter (D) times 0.214
ASME High Crown F&D	Multiply diameter (D) times 0.186
ASME 2:1 Semi-Ellipsoidal	Multiply diameter (D) times 0.25
DIN-28011 Klopper/Decimal	Multiply diameter (D) times 0.188
DIN-28013 Korbboogen/Semi-Ellipsoidal	Multiply diameter (D) times 0.25

If your vessel does not meet any of the requirements for the vessel calculators, then you can select Custom / Lookup Table. Also known as a strapping table or gauging table, it can account for any vessel shape, including those that are non-linear to the measuring sensor. When choosing a custom table, it's important to have good data regarding height vs. output. Some bin manufacturers provide this information and/or a detailed drawing. If you have a detailed drawing, it is possible to calculate the points for a strapping table. You must have at least two points or rows in the table.

There are two ways to enter your table into Bininventory, either import it from a spreadsheet application or manually enter each row directly.

Follow these steps for importing your table:

1. Using a spreadsheet application, such as Microsoft Excel, open up or create your custom table with as many rows as needed. It must have at least two rows and exactly two columns. The first column should be the drop distance between the sensor and the surface of the product. The second column should contain the output values. Use only numbers and do not include any units in your table.
2. Referring to Figure 21, select all the cells making up your table, right click on the selected cells and then click copy.



The screenshot shows an Excel spreadsheet with the following data:

	A	B	C	D	E
1	0	8000			
2	2	6400			
3	4	4800			
4	6	3200			
5	8	1600			
6	10	0			

**Figure 21**

3. Referring to Figure 22, switch to Bininventory Workstation and select Custom / Lookup Table for the vessel type on the Type/Shape tab of Vessel Setup.
4. Click the Import button to import or paste the copied table into the form.
5. Select the type of output you want from this table. Choose between Height, Volume or Weight. Note that the distance units are set under Site Maintenance and the Volume and Weight units are set on the Display tab of Vessel Setup. You can confirm and/or change these after entering your table.
6. Continue with vessel setup on the other tabs then click the Save button.

**Vessel Setup - Tank 1**

Display | Type/Shape | Contents | Sensor | Alarms | Email Notifications

Vessel Type: Custom / Lookup Table **3**

Distance Units: Feet (ft)

Add Row

Delete Row

**4** Import

Export

Distance (ft)	Product Volume (bu)
0	8000
2	6400
4	4800
6	3200
8	1600
10	0

Output Type: Product Volume (bu) **5**

**Import**  
Click this button to insert a spreadsheet into the custom table. To use, first create a table in a spreadsheet application, select and copy the table, then click the Import button.

Save Cancel

Figure 22

Referring to Figure 23, follow these steps for manually entering the table data:

1. Select Custom / Lookup Table for the vessel type.
2. Select the type of output you want from this table. Choose between Height, Volume or Weight. Note that the distance units are set under Site Maintenance and the Volume and Weight units are set on the Display tab of Vessel Setup. You can confirm and/or change these after entering your table.
3. Enter a new row or point in the table by clicking the Add Row button.
4. Click on the cell under Distance to Product for the row just added and enter a drop distance in the specified units.
5. Click on the cell under Output for the same row and enter the output value for the corresponding drop distance.
6. Repeat the last three steps until all needed points or rows are entered.
7. Continue with vessel setup on the other tabs and then click the Save button.

**Vessel Setup - Tank 1**

Display | Type/Shape | Contents | Sensor | Alarms | Email Notifications

Vessel Type: Custom / Lookup Table 1

Distance Units: Feet (ft)

3 Add Row

Delete Row

Distance (ft)	Product Height (ft)
0	8000
2	6400
4	4800

4

5

Import

Export

Output Type: Product Height (ft) 2

Add Row  
Click this button to add a new empty row to the table. A custom table must have at least two rows or points in it.

Save Cancel

Figure 23

### 5.4.7.3 Contents Tab

The Contents tab in Vessel Setup provides fields for entering a description of the vessel's contents and its density or specific gravity.

For the Contents/Product field, you can directly enter the description; or, if it's been used on another vessel at this site, you can select it from a drop down list by clicking on the down arrow towards the right of the field.

If using a custom/lookup table, it is not required to enter the product density or specific gravity. If not using a custom/lookup table, it is critical to have an accurate value entered for density or specific gravity.

#### 5.4.7.4 Sensor Tab

The Sensor tab, in Vessel Setup, is where you set up sensors for a vessel. Following are all the BinMaster sensors supported by BinInventory v5.4 and their protocol used:

- SmartBob (Protocol B)
- SmartBob-II (Protocol A)
- SmartBob-II Average (Protocol A)
- SmartSonic (Modbus/RTU)
- SmartWave (Modbus/RTU)
- MNU Ultrasonic (Modbus/RTU)
- MPX Magnetostrictive (Modbus/RTU)
- PT-400 Pressure Transmitter (Modbus/RTU)
- PT-500 Pressure Transmitter (Modbus/RTU)
- NCR-80 Non-Contact Radar (Modbus/RTU)
- GWR-2000/3000 Guided Wave Radar (Modbus/RTU)
- SmartBob via C-100MB (Modbus/RTU)
- 3D Level Scanner (Modbus/RTU)
- SPL-100 Single Point Laser (SPL-100 Push)
- SPL/FVL-200 Single Point Laser (SPL-200 Push)
- HART Sensor (HART Protocol)

On this tab, you must first select the type of sensor network to be used by this sensor. After selecting the sensor network, the Sensor Type control will be populated with all compatible sensors. All sensors at a site must be compatible with each other. If support for different compatible sensors is needed, then a new site or sensor network must be setup.

For most sensor types, you simply need to check Enabled and enter the sensor's address. Although the Enabled checkbox must be checked when creating a new vessel, you can change it at another time if you need to temporarily disable the sensor from any scheduled readings. The address for each sensor must be different but agree with what the sensor is set for.

Some sensor types also have the sensor offset setting. For top-down sensors, this is the vertical distance between the sensor and the top of the tank or what you want to consider the full mark. A positive value places the sensor down inside the vessel; a negative value places the sensor up above the vessel. For bottom-up sensors (PT-400 and PT-500), the sensor offset is the distance between the bottom of the tank and the sensor measuring point. A positive offset indicates the sensor is above the bottom of the tank (typical) and a negative offset indicates the sensor is below the bottom of the tank. In all cases, sensor offset defaults to zero.

## SmartBob (Protocol B)

Protocol B is supported by all SmartBob types. However, it is older and should only be used when you have one or more original SmartBobs on your network.

Refer to Figure 24. When selecting SmartBob, you must check Enabled and enter the sensor's address. Valid addresses are 1 through 255. Optionally, you can specify a sensor offset.

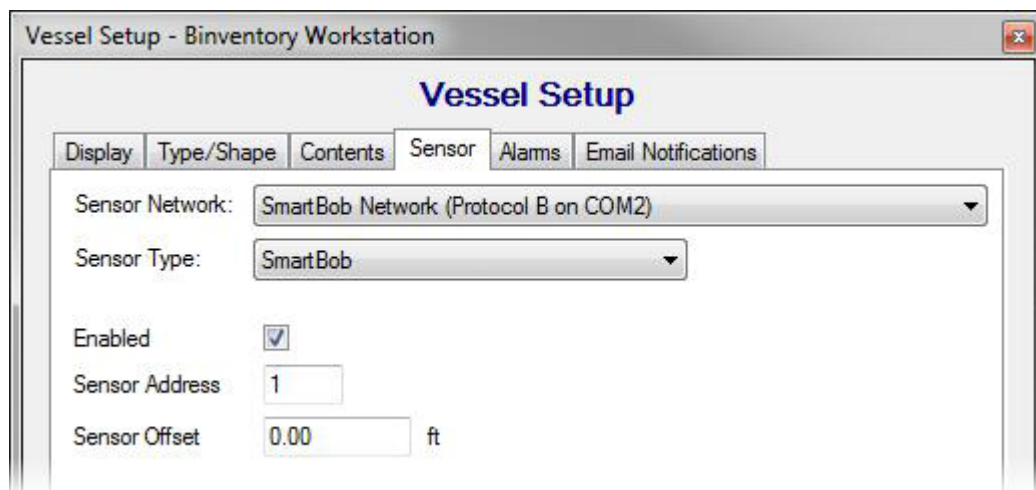


Figure 24



## SmartBob-II (Protocol A)

Protocol A is supported by both the SmartBob-II and SmartBob-TS1 and is the preferred protocol to use when all the sensors on the network are SmartBob-II or SmartBob-TS1.

Refer to Figure 25. When selecting SmartBob-II, you must check Enabled and enter the sensor's address. Valid addresses are 1 through 255. Optionally, you can specify a maximum drop distance and a sensor offset.

Max Drop is the maximum distance you want the SmartBob-II or SmartBob-TS1 to drop its bob. The units for max drop are as per the distance units shown on the Display tab. Note that the SmartBob-II or SmartBob-TS1 must have firmware v2.8 or newer in order to support the max drop feature.

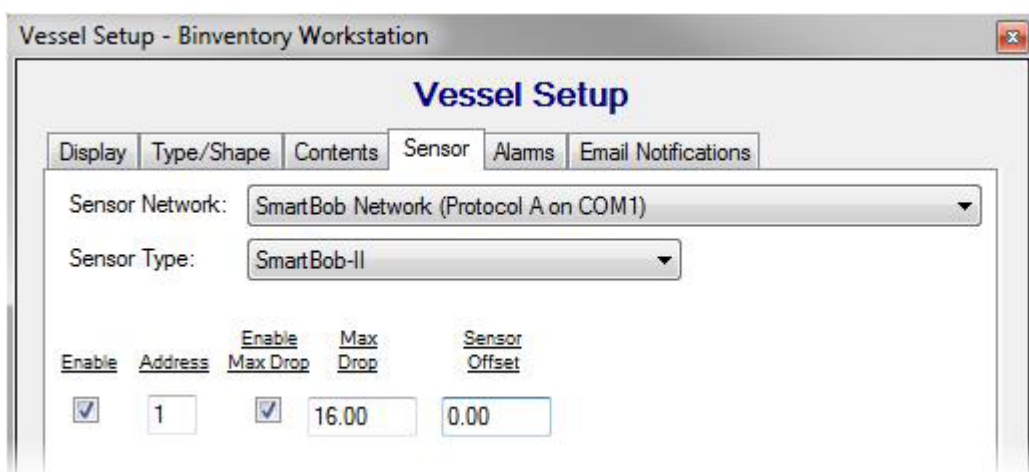


Figure 25

## SmartBob-II Average (Protocol A)

If you have multiple SmartBob-II or SmartBob-TS1 mounted on a single vessel and want to average the readings together, you can select SmartBob-II Average for the sensor type. When you select this sensor type, you are presented with 32 rows available for defining up to 32 sensors per vessel. Refer to Figure 26. This sensor type is network compatible with SmartBob-II.

Optionally, you can set a sensor offset for each sensor. If one or more of the sensors are not vertically mounted at the same height, then you will have to set the offset for them.

The average function is performed as a weighted average; you specify a weight as a percent for each sensor which defines how much impact or weight its reading will have in the average calculation. If you want the arithmetic mean or un-weighted average then click the Distribute Weight button to balance or weight all enabled sensors the same. A Weight % value must be specified for all enabled sensors and they must all add up to 100%.

Optionally, you can define a name or label for each sensor, which helps identify each sensor when viewing them in the Vessel Details screen.

In the example presented in Figure 26, four sensors labeled North, East, South and West are going to be used in the average calculation due to their weight value each being set equally at 25%. The fifth sensor, labeled Center and a weight of 0%, is only going to be used in the Vessel Details screen to see if the surface of the product is cone-up or cone-down.

The screenshot shows the 'Vessel Setup - Big Ben' window with the 'Sensor' tab selected. The 'Sensor Network' is set to 'SmartBob Network (Protocol A on COM1)' and the 'Sensor Type' is 'SmartBob-II Average'. Below this is a table of sensor configurations.

Enable	Address	Enable Max Drop	Max Drop	Sensor Offset	Weight %	Sensor Label
<input checked="" type="checkbox"/>	1	<input checked="" type="checkbox"/>	10.00	0.00	25.00	North
<input checked="" type="checkbox"/>	2	<input checked="" type="checkbox"/>	10.00	0.00	25.00	East
<input checked="" type="checkbox"/>	3	<input checked="" type="checkbox"/>	10.00	0.00	25.00	South
<input checked="" type="checkbox"/>	4	<input checked="" type="checkbox"/>	10.00	0.00	25.00	West
<input checked="" type="checkbox"/>	5	<input checked="" type="checkbox"/>	10.00	0.00	0.00	Center
<input type="checkbox"/>		<input type="checkbox"/>				
<input type="checkbox"/>		<input type="checkbox"/>				
<input type="checkbox"/>		<input type="checkbox"/>				

Below the table are buttons for 'Enable All', 'Disable All', and 'Distribute Weight'. The 'Total Weight' is displayed as 100.00%.

Total Weight: 100.00%

Distribute Weight Total weight must equal 100%.

Figure 26

**SmartSonic (Modbus/RTU)****SmartWave (Modbus/RTU)**

The SmartSonic and SmartWave both use Modbus/RTU and can be used with other Modbus/RTU sensors, as long as their communication parameters are the same.

Refer to Figure 27. When selecting either of these two types of sensors you must check Enabled and enter the sensor's address. Valid addresses for the SmartSonic and SmartWave are 4 through 255. Optionally, you may provide a sensor offset. In order for Binventory to properly read data out of the SmartSonic and SmartWave sensors, you will need to correctly set Decimal Places for the version of your unit. Older units require a setting of 1 and newer units a setting of 2.

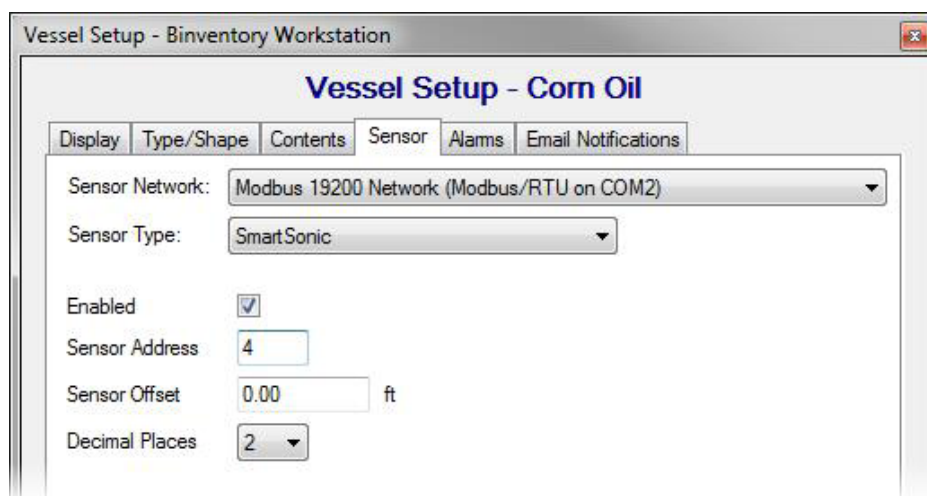


Figure 27

**MNU Ultrasonic (Modbus/RTU)**

**MPX Magnetostrictive (Modbus/RTU)**

**PT-400 Pressure Transmitter (Modbus/RTU)**

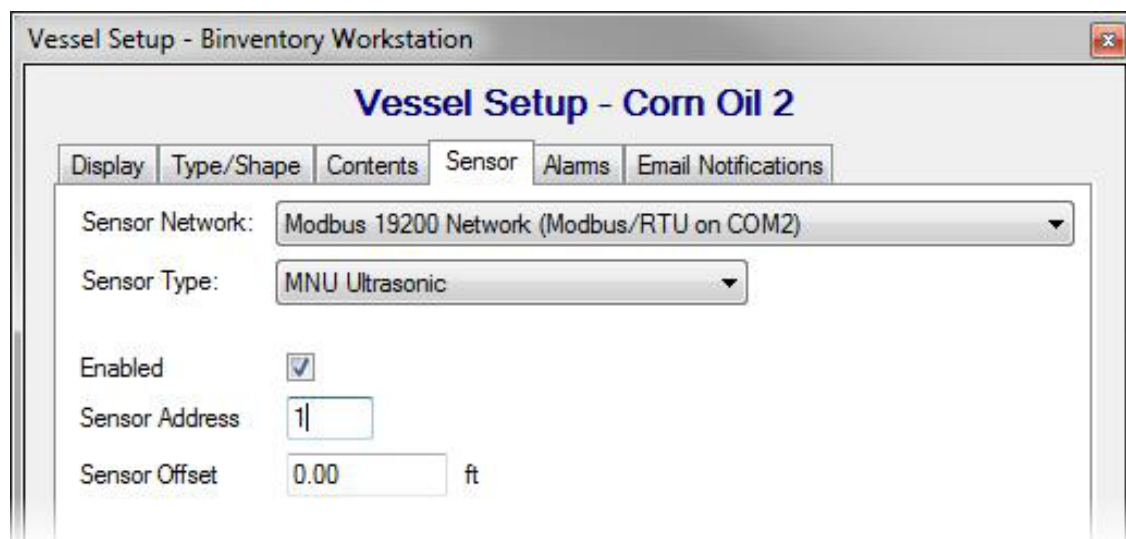
**PT-500 Pressure Transmitter (Modbus/RTU)**

**SmartBob via C-100MB (Modbus/RTU)**

These five sensors all use Modbus/RTU and can be used with other Modbus/RTU sensors, as long as their communication parameters are the same.

Refer to Figure 28. When selecting any of these sensor types you must check Enabled and enter the sensor's address. Valid sensor addresses for the MNU and MPX are 1 through 255. Valid sensor addresses for the PT-400 and PT-500 are 1 through 247. Valid sensor addresses for the SmartBob via C-100MB are 1 through 120.

These sensor types also have the option to set an offset.



**Figure 28**

**NCR-80 Non-Contact Radar (Modbus/RTU)**

**GWR-2000/3000 Guided Wave Radar (Modbus/RTU)**

These two sensors use Modbus/RTU and can be used with other Modbus/RTU sensors, as long as their communication parameters are all the same.

Refer to Figure 29. With these two sensor types, you can have up to 32 sensors installed on a single vessel and average the results together. If you have more than one of these sensor types installed, adjust the sensor count to the number installed. You will then have a row of controls available for each sensor. You must specify a unique address for each sensor with valid values between 1 and 255. You must also specify an offset for each sensor.

The average function is performed as a weighted average; you specify a weight as a percent for each sensor which defines how much impact or weight its reading will have in the average calculation. If you want the arithmetic mean or un-weighted average then click the Distribute Weight button to balance or weight all enabled sensors the same. A Weight % value must be specified for all enabled sensors and they must all add up to 100%.

Optionally, you can define a name or label for each sensor, which helps identify each sensor when viewing them in the Vessel Details screen.

**Vessel Setup - Bin A**

Sensor Network: Modbus Network (Modbus/RTU on COM1)

Sensor Type: NCR-80 Open Air Radar

Sensor Count: 4

Enable	Address	Offset (ft)	Weight (%)	Sensor Label
<input checked="" type="checkbox"/>	1	0.00	25.00	North
<input checked="" type="checkbox"/>	2	0.00	25.00	East
<input checked="" type="checkbox"/>	3	0.00	25.00	South
<input checked="" type="checkbox"/>	4	0.00	25.00	West

Enable All      Total Weight: 100.00%      Disable All      Balance All

Save      Cancel

Figure 29

### 3D Level Scanner (Modbus/RTU)

Refer to Figure 30. When selecting 3D Level Scanner you must check Enabled and enter the sensor's address. Valid sensor addresses are 1 through 64.

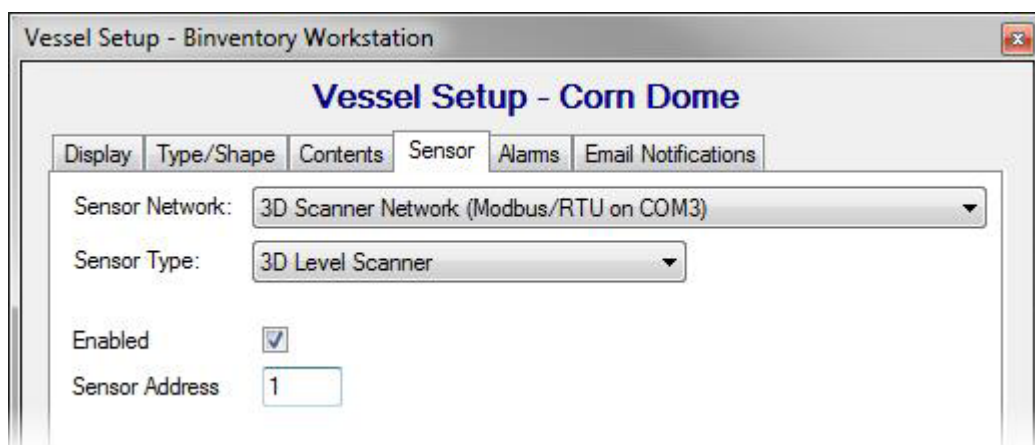


Figure 30

### SPL-100 Single Point Laser (SPL-100 Push)

Select this sensor type when you have an SPL-100 single point laser installed on a network with the appropriate RF radio.

You must provide the sensors address in the range of 1 to 255.

### SPL/FVL-200 Single Point Laser (SPL-200 Push)

Select this sensor type when you have an SPL-200 single point laser installed on a network with the appropriate RF radio.

You must provide the sensors address in the range of 1 to 255.

### HART Sensor (HART Protocol)

Select this sensor type when you have a HART sensor connected to the network through a HART modem.

You must provide the sensors polling address in the range of 0 to 63.

### 5.4.7.5 Alarms Tab

The Alarms tab in Vessel Setup is where you define high or low level alarms. After these are enabled and set and a measurement produces a level that exceeds these settings, a blinking red alarm indication will be visible with the corresponding vessel on the main screen.

There are four level alarms that can be enabled and set with a percent full:

- **High Alarm** – this can be considered a critical high level and will override a Pre-High Alarm.
- **Pre-High Alarm** – this can be considered a warning for high level.
- **Pre-Low Alarm** – this can be considered a warning for a low level.
- **Low Alarm** – this can be considered a critical low level and will override a Pre-Low Alarm.

Once these alarms are enabled and set, you can also set up Email Notifications for receiving emails when a level-alarm condition occurs. Refer to Figure 31 for an example of how these may be set.

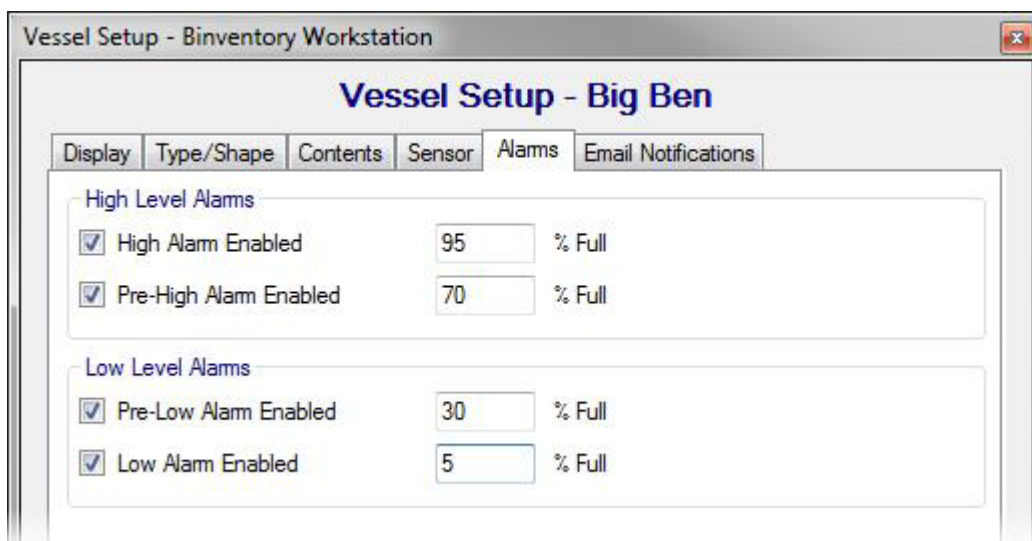


Figure 31

### 5.4.7.6 Email Notifications Tab

Email notifications can be configured for each vessel providing three basic types of notices:

1. **Level Alarm** – This will send an email notification whenever a high, pre-high, pre-low or low alarm level is reached and will provide the current product level.
2. **Vessel Status** – This will send an email notification every time a new reading is taken and will provide details about the vessel and the product level.
3. **Error Alarm** – This will send an email notification every time a measurement fails.

While referring to Figure 32, follow these steps to set up email notifications:

1. On the Email Notifications tab, check Enable Email Notifications.



2. Click the Select Contacts button to open the Vessel Contacts screen. From within the Assign Vessel Contacts screen, add any contacts that wish to receive email notifications and click the Close button to return.
3. In the contact list, click on a contact to select it.
4. Towards the bottom, check the email notifications that this contact should receive.
5. Repeat steps 3 and 4 for other contacts in the list. Each contact can be set up to receive different email notifications.
6. When done setting up this vessel, click the Save button.

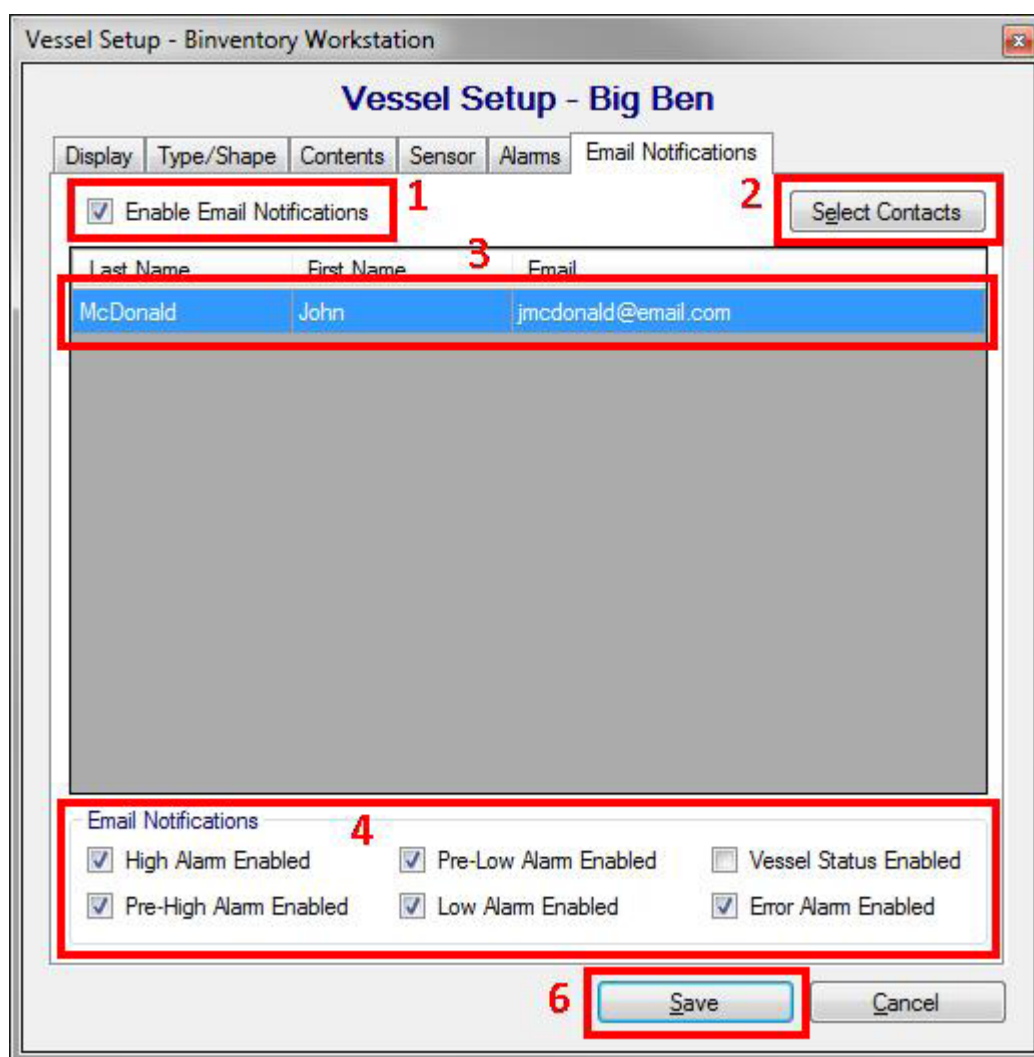


Figure 32

### 5.4.8 Group Maintenance and Setup

Vessel Group Maintenance under the Specifications menu is where you add, edit or delete groups of vessels in the currently assigned site. Vessel groups have one purpose and that is to organize vessels for measurement schedules. If you are not going to set up any measurement schedules then you do not need to set up any vessel groups. Refer to Figure 33 for the Vessel Group Maintenance and Setup screens.

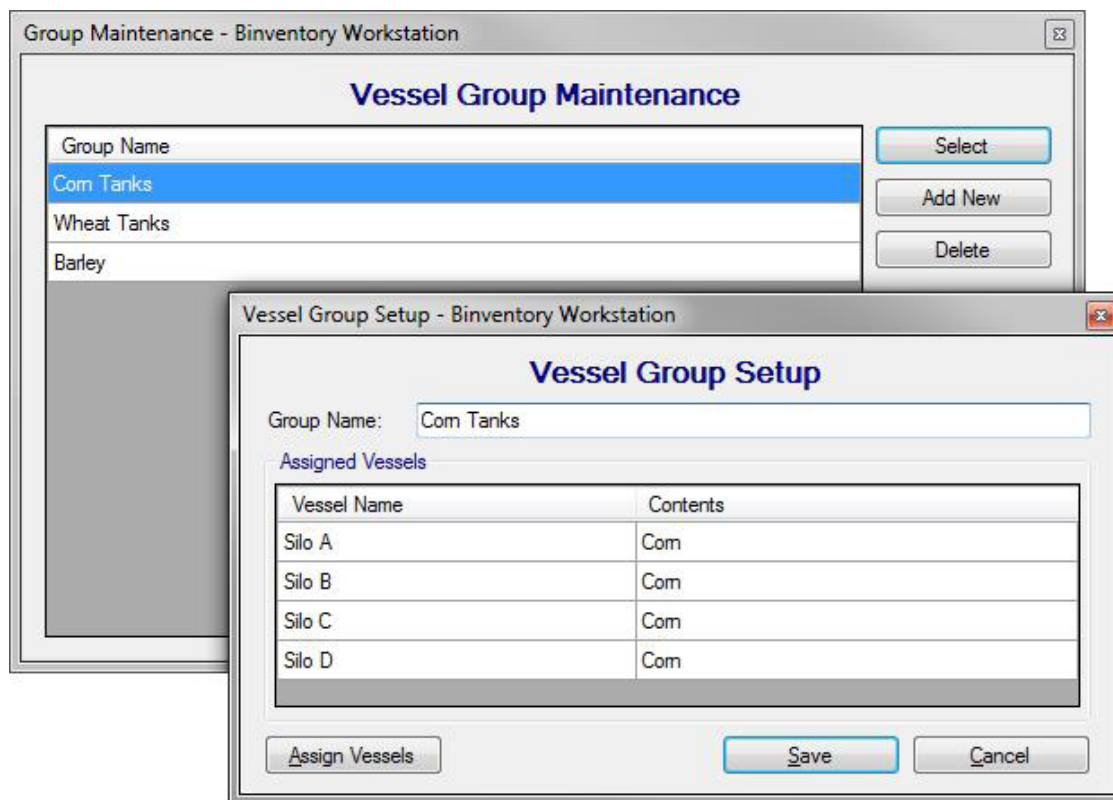


Figure 33

To create a new group, click the Add New button from within the Vessel Group Maintenance screen. This will open a blank Vessel Group Setup screen for you to define a new group. Give the group a unique and descriptive name, then click Assign Vessels to assign vessels to the group. When done configuring this group, click the Save button.

To edit or modify an existing group, highlight it from within the Vessel Group Maintenance screen and click the Select button. This will open the Vessel Group Setup screen populated with this group's name and assigned vessels. Make any necessary changes and click the Save button.

To delete an existing group, highlight it from within the Vessel Group Maintenance screen and click the Delete button. You will be prompted to confirm the deletion of the group.

### 5.4.9 Measurement Schedules

Schedule Maintenance under the Vessel menu is where you add, edit or delete measurement schedules in the currently assigned site. Measurement schedules first require that vessels be organized into groups.

To create a new measurement schedule, click the Add New button from within the Schedule Maintenance screen. This will open a blank Schedule Setup screen for you to define a new schedule. Provide a unique and descriptive name, configure the schedule and assign vessel groups to the schedule. When done configuring the schedule, click the Save button.

Note that when creating a new schedule the Schedule Active control will, by default, be checked and cannot be unchecked. Thus any new schedule will immediately be active. Once created, you can select it for editing then de-activate it if needed.

Example 1 – Refer to Figure 34 for a schedule that will start on 9/16/2013 and take a reading every hour, on the hour, but only from 8 AM to 5 PM every weekday.

**Schedule Setup**

**Measurement Schedule Setup**

**Schedule Information**

Schedule Name: Com Silos Every Work Hour

Start Date: 9/16/2013 Start Time: 11:00 AM

☒ Schedule Active

**Schedule Type**

☒ At regular intervals ☐ Daily ☐ Weekly ☐ Monthly ☐ Run only once

**Run only on**

☐ Sun ☒ Mon ☒ Tue ☒ Wed ☒ Thu ☒ Fri ☐ Sat

**Run in intervals**

Intervals: 60 minutes Start Time: 8:00 AM End Time: 5:00 PM

Assign Groups Save Cancel

Figure 34

**Example 2** – Refer to Figure 35 for a schedule that will start on 9/16/2013 and take a reading every work weekday at 7 AM.

**Schedule Setup**

**Measurement Schedule Setup**

**Schedule Information**

Schedule Name: Corn Silos Every Work Morning

Start Date: 9/16/2013 Start Time: 7:00 AM

☒ Schedule Active

**Schedule Type**

☐ At regular intervals ☒ Daily ☐ Weekly ☐ Monthly ☐ Run only once

**Run only on**

☐ Sun ☒ Mon ☒ Tue ☒ Wed ☒ Thu ☒ Fri ☐ Sat

**Run in intervals**

Intervals: minutes Start Time: 8:00 AM End Time: 5:00 PM

Assign Groups Save Cancel

**Figure 35**

**Example 3** – Refer to Figure 36 for a schedule that will start on 9/16/2013 and take a reading continuously every hour.

**Schedule Setup**

**Measurement Schedule Setup**

**Schedule Information**

Schedule Name: Corn Silos Every 2 Hours

Start Date: 9/16/2013 Start Time: 7:00 AM

☒ Schedule Active

**Schedule Type**

☒ At regular intervals ☐ Daily ☐ Weekly ☐ Monthly ☐ Run only once

**Run only on**

☒ Sun ☒ Mon ☒ Tue ☒ Wed ☒ Thu ☒ Fri ☒ Sat

**Run in intervals**

Intervals: 60 minutes Start Time: 12:00 PM End Time: 11:00 PM

Assign Groups Save Cancel

**Figure 36**

To edit or modify an existing schedule, highlight it from within the Schedule Maintenance screen and click the Select button. Make any necessary changes and click the Save button. Note that measurement schedules can also be temporarily disabled by un-checking the Schedule Active checkbox.

To delete an existing schedule, highlight it from within the Schedule Maintenance screen and click the Delete button. You will be prompted to confirm the deletion of the schedule.

#### 5.4.10 User Maintenance and Setup

User Maintenance under the File menu is where you add, edit or delete users. Users must be set up if you are going to require them to login to BinInventory Workstation. Refer to **5.4.1 System Setup** on how to change the Workstation to require users to login. Refer to **5.4.11 User Login and Change Password** on how to login and logout of BinInventory Workstation.

By default a system administrator user is set up at installation. The User ID is *admin* and the default password is *1234*. You can change the password to this user, but you cannot delete this user or change its user ID.

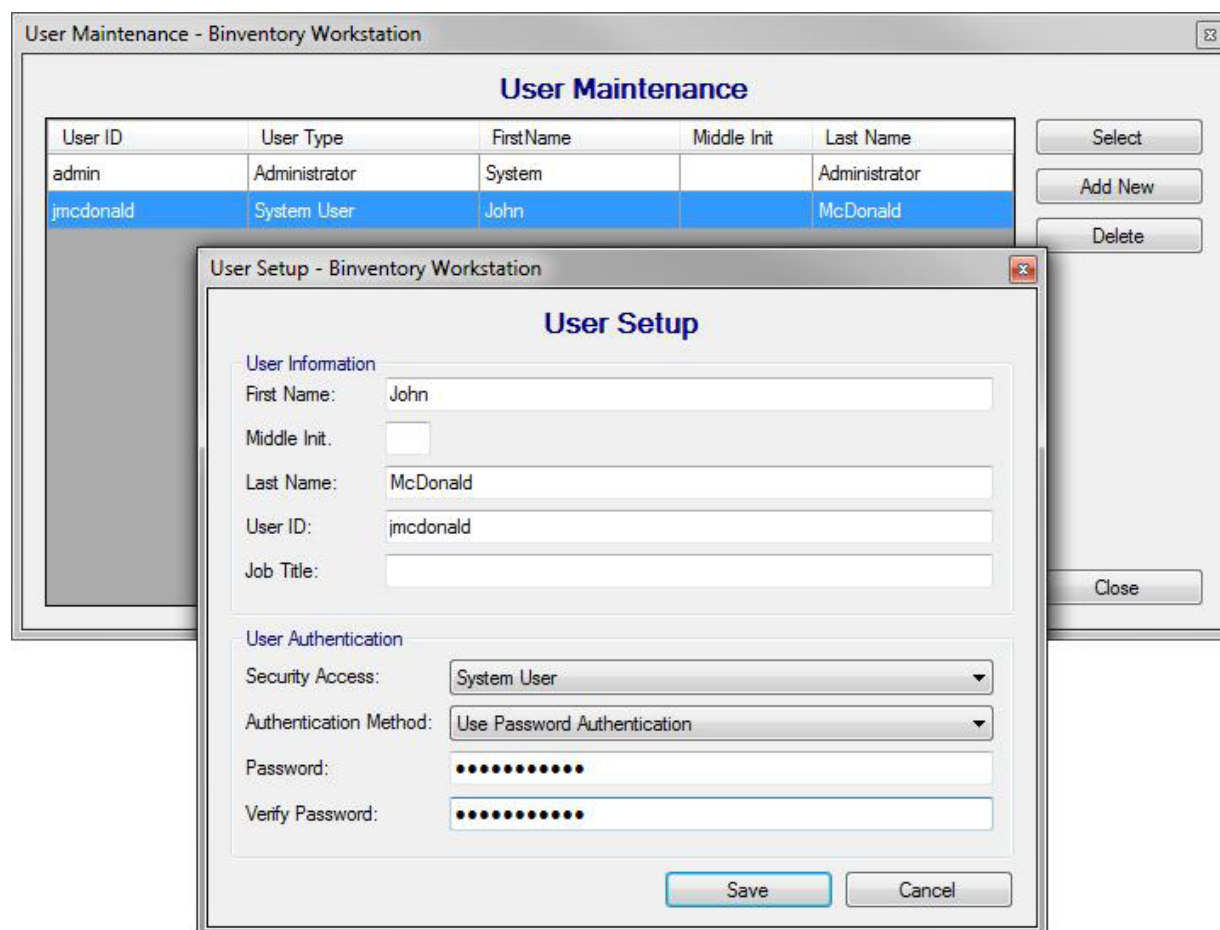


Figure 37

To create a new user, click the Add New button from within the User Maintenance screen. This will open a blank User Setup screen for you to define a new user. Referring to Figure 37, enter the user's name, a unique user ID and a password. Also, select the appropriate security access level for this user. When done creating this user, click the Save button.

There are three users or security access types available:

1. **System User (Read-Only)** – This type of user can view current vessel levels, initiate new measurements and create reports. They can NOT access the Specifications menu nor can they access System Import/Export and User Maintenance under the File menu. And, although they can access the Vessel menu, they cannot make any configuration changes under the Vessel menu.
2. **System User** – This type of user is similar to a System User (Read-Only), except that they can make configuration changes under the Vessel menu.
3. **System Administrator** – This type of user has all access.

To edit or modify an existing user, highlight the user from within the User Maintenance screen and click the Select button. This will open the User Setup screen populated with this user's information. Make any necessary changes and click the Save button.

To delete an existing user, highlight the user from within the User Maintenance screen and click the Delete button. You will be prompted to confirm the deletion of the user.

#### 5.4.11 User Login and Change Password

If Bininventory Workstation is configured to require users to login, then it will prompt you for a user ID and password after opening the application. You must be setup as a user with a valid user ID and password in order to log in to the Bininventory Workstation. Referring to Figure 38, enter your user ID, your password and then click the Login button to gain access to the Workstation.

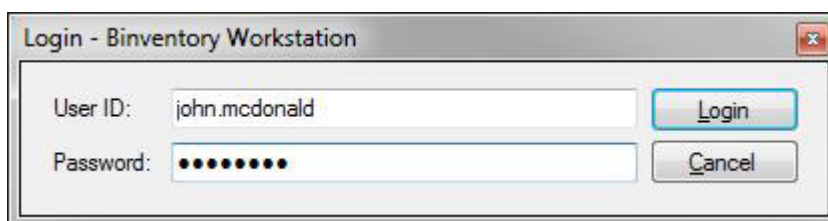


Figure 38

To log off or out of the Workstation, select Logoff under the File menu. You will no longer have access to Bininventory and your vessels. You may now exit or login as a different user.

If Bininventory Workstation is configured to require users to login and you are currently logged in, then you can select Change Password under the File menu to change your password. Referring



to Figure 39, enter your current password, your new password twice and then click the Save button. A System Administrator may also change your password under User Maintenance.

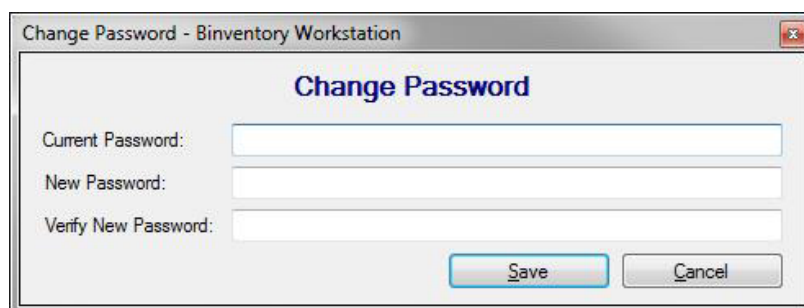


Figure 39

#### 5.4.12 Temporary Group Setup

The Temporary Group Setup screen is available under the Vessel menu and allows the user to show or hide vessels from the main screen and re-order them. This is only temporary and is maintained as long as you are logged into Bininventory. Once you log out or exit the Workstation this setting is lost.

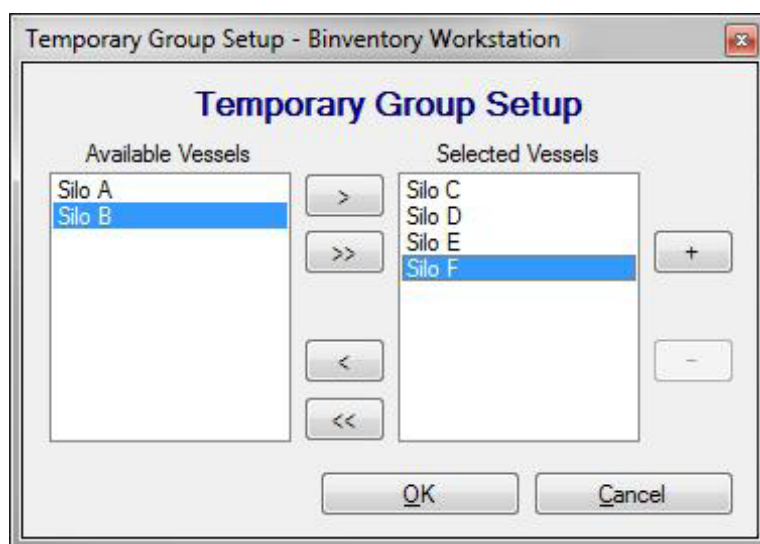


Figure 40

Referring to Figure 40, the list on the left (Available Vessels) is vessels that are available but will not be visible. The list on the right (Selected Vessels) is vessels that are currently visible and can be re-ordered. By default, all vessels are visible and sorted by the vessel name.

- To show a hidden vessel, select it in the list on the left (Available Vessels) and click the > button to move it to the list on the right (Selected Vessels).
- To show all hidden vessels, click the >> button to move all to the list on the right (Selected Vessels).
- To hide a visible vessel, select it in the list on the right (Selected Vessels) and click the < button to move it to the list on the left (Available Vessels).



- To hide all visible vessels, click the << button to move all to the list on the left (Available Vessels).
- To reorder or change a visible vessels location, select it in the list on the right (Selected Vessels) and click the + or – buttons to move it up or down in the list.
- Click the OK button to accept any changes.

### 5.4.13 Print Reports and Export Data

To create reports or export data, click on Print Reports under the Reports menu. The Print Reports screen will appear with a list of reporting options. The majority of these reports are generated using Crystal Reports and can be printed or converted to a PDF. There are three report options available as seen in Figure 41.

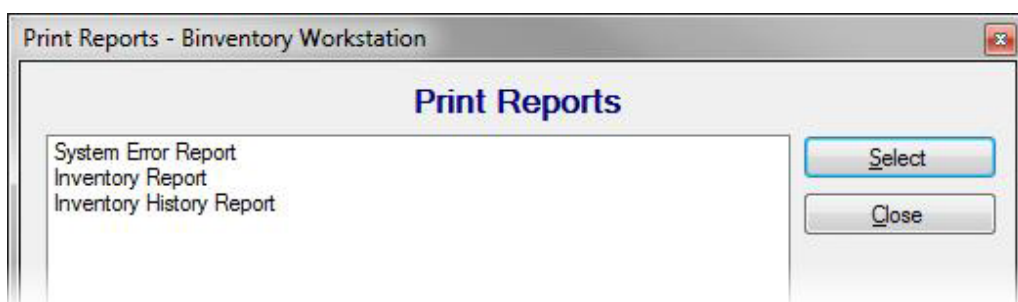


Figure 41

#### 5.4.13.1 System Error Report

Select System Error Report to create a report with any errors that may have occurred and were captured by BinInventory. This report may be useful in sending to BinMaster for troubleshooting purposes.

To create a System Error Report:

1. Highlight System Error Report in the Print Reports screen and click the Select button. You should be prompted to enter a date range.
2. Enter a date range to limit the errors to be included and click the OK button. The default range is seven days.
3. Once viewing the Crystal Report go to section **5.4.13.4 Working with Crystal Reports** for details on how to print or convert the report to another file format.

#### 5.4.13.2 Inventory Report

Inventory Report is primarily to generate a vessel inventory report in either a table or bar graph format, but can also be used to export the vessel history to a comma-separated values (CSV) file. The vessel inventory report and bar graph are generated in Crystal Reports and thus can be printed or converted to other file formats, such as Acrobat PDF or Word DOC. Figure 42 provides a partial view of an example of a vessel inventory report. Figure 43 provides a full view of an example of a vessel inventory bar graph. Figure 44 provides a partial view of an example of vessel history exported to a CSV file.

From Date: 6/18/2018 Thru Date: 6/25/2018		BinInventory Workstation Inventory Report (Nebraska Farm)						6/25/2018 2:59:56PM	
Vessel Name	Vessel Contents	Measurement Date	Product Volume	Product Weight	Product Height	Headroom Volume	Headroom Weight	Headroom Height	% Full
Silo A	Corn	6/25/2018 2:55:44 PM	676.56 bu	37,045.66 lbs	16.75 ft	131.27 bu	7,187.96 lbs	3.25 ft	84%
Silo B	Corn	6/25/2018 2:56:05 PM	269.11 bu	14,735.33 lbs	6.66 ft	538.72 bu	29,498.30 lbs	13.34 ft	33%
Silo C	Corn	6/25/2018 2:56:05 PM	277.69 bu	15,205.31 lbs	6.88 ft	530.14 bu	29,028.32 lbs	13.12 ft	34%
Silo D	Corn	6/25/2018 2:55:59 PM	286.27 bu	15,675.29 lbs	7.09 ft	521.56 bu	28,558.33 lbs	12.91 ft	35%
Silo E	Wheat	6/25/2018 2:56:00 PM	294.86 bu	16,145.27 lbs	7.30 ft	512.97 bu	28,088.35 lbs	12.70 ft	36%
Silo F	Wheat	6/25/2018 2:56:00 PM	512.97 bu	28,088.35 lbs	12.70 ft	294.86 bu	16,145.27 lbs	7.30 ft	64%
Silo G	Wheat	6/25/2018 2:56:06 PM	106.53 bu	5,833.31 lbs	2.64 ft	701.30 bu	38,400.32 lbs	17.36 ft	13%
Silo H	Wheat	6/25/2018 2:56:02 PM	494.80 bu	27,093.10 lbs	12.25 ft	313.03 bu	17,140.53 lbs	7.75 ft	61%
Silo I	Barley	6/25/2018 2:56:06 PM	88.36 bu	4,838.05 lbs	2.19 ft	719.47 bu	39,395.57 lbs	17.81 ft	11%
Silo J	Barley	6/25/2018 2:55:55 PM	476.12 bu	26,070.19 lbs	11.79 ft	331.72 bu	18,163.43 lbs	8.21 ft	59%
Silo K	Barley	6/25/2018 2:56:07 PM	69.68 bu	3,815.15 lbs	1.72 ft	738.16 bu	40,418.47 lbs	18.28 ft	9%
Silo L	Barley	6/25/2018 2:55:56 PM	551.85 bu	30,217.00 lbs	13.66 ft	255.08 bu	14,016.53 lbs	6.31 ft	68%

Figure 42

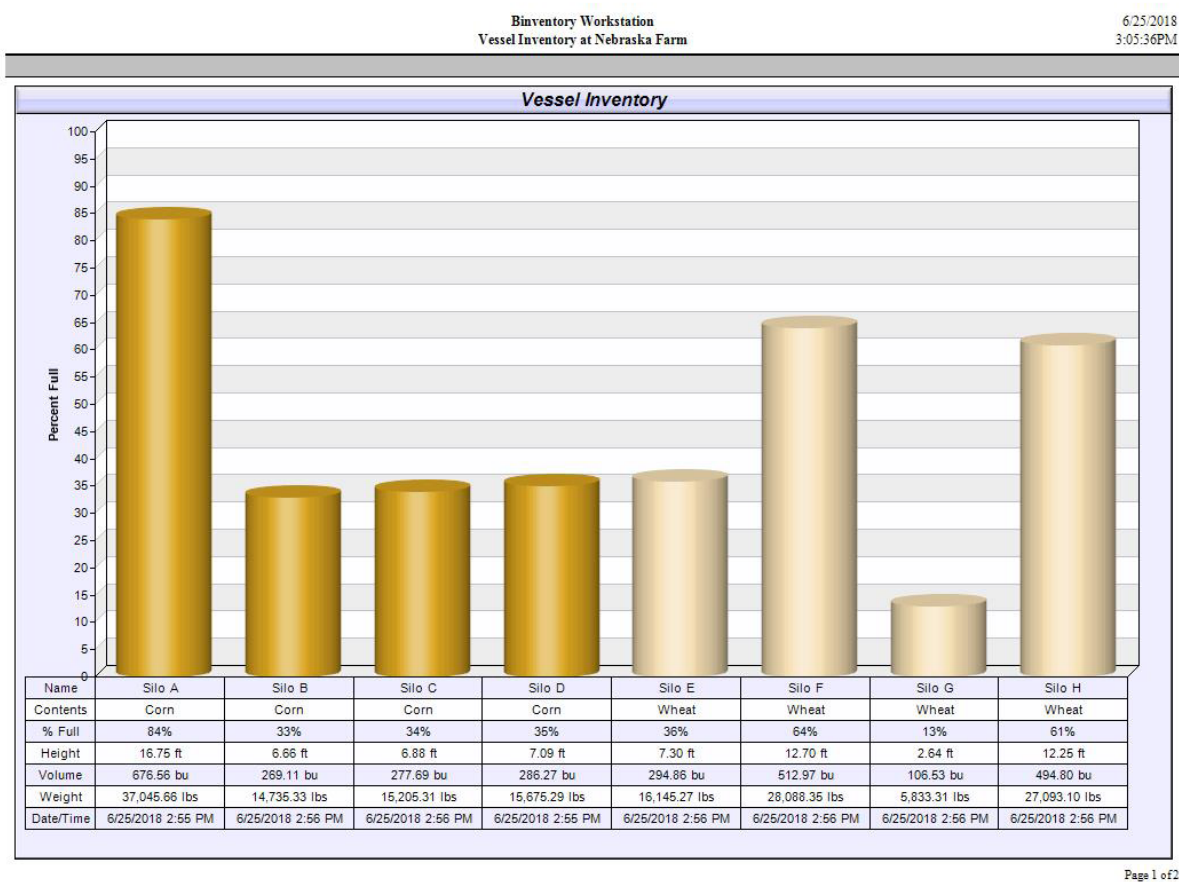


Figure 43

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	
	Measurement Time	Site	Vessel Name	Contents	Vessel Type	Distance Units	Volume Units	Weight Units	Vessel Height	Vessel Radius	Vessel Length	Vessel Width	Hopper Height	Outlet Radius	Outlet Length	Outlet Width	Capacity Volume	
1	9/18/2013 9:45	Nebraksa Farm	'Silo A'	'Corn'	'CYLINDER'	'ft'	'bu'	'lbs'	60	4	0	0	0	0	0	0	2423.49	'Smart'
2	9/18/2013 9:41	Nebraksa Farm	'Silo A'	'Corn'	'CYLINDER'	'ft'	'bu'	'lbs'	60	4	0	0	0	0	0	0	2423.49	'Smart'
3	9/18/2013 9:36	Nebraksa Farm	'Silo A'	'Corn'	'CYLINDER'	'ft'	'bu'	'lbs'	60	4	0	0	0	0	0	0	2423.49	'Smart'
4	9/18/2013 9:30	Nebraksa Farm	'Silo A'	'Corn'	'CYLINDER'	'ft'	'bu'	'lbs'	60	4	0	0	0	0	0	0	2423.49	'Smart'
5	9/18/2013 9:25	Nebraksa Farm	'Silo A'	'Corn'	'CYLINDER'	'ft'	'bu'	'lbs'	60	4	0	0	0	0	0	0	2423.49	'Smart'
6	9/18/2013 9:20	Nebraksa Farm	'Silo A'	'Corn'	'CYLINDER'	'ft'	'bu'	'lbs'	60	4	0	0	0	0	0	0	2423.49	'Smart'
7	9/18/2013 9:15	Nebraksa Farm	'Silo A'	'Corn'	'CYLINDER'	'ft'	'bu'	'lbs'	60	4	0	0	0	0	0	0	2423.49	'Smart'
8	9/18/2013 9:10	Nebraksa Farm	'Silo A'	'Corn'	'CYLINDER'	'ft'	'bu'	'lbs'	60	4	0	0	0	0	0	0	2423.49	'Smart'

Figure 44

To create a vessel inventory report or bar graph:

1. Highlight Inventory Report in the Print Reports screen and click the Select button.
2. Choose your output type by clicking on Report or Bar Graph.
3. Choose which vessels you want to include in the report. Vessels in the list on the right (Selected Vessels) will be included. Vessels in the list on the left (Available Vessels) will NOT be included. Use the > button to include a single vessel or the >> button to include all vessels. Use the < button to exclude a single vessel or the << button to exclude all vessels.
4. Choose to sort the report by either vessel name or contents.
5. Click the OK button to view the report.
6. Once viewing the Crystal Report, go to section **5.4.13.4 Working with Crystal Reports** for details on how to print or convert the report to another file format.

### 5.4.13.3 Inventory History Report

Select this to create a chart or graph of a single vessel's level history. This vessel history chart is generated in Crystal Reports and thus can be printed or converted to other file formats, such as Acrobat PDF or Word DOC. Refer to Figure 45 for an example of a vessel history chart.

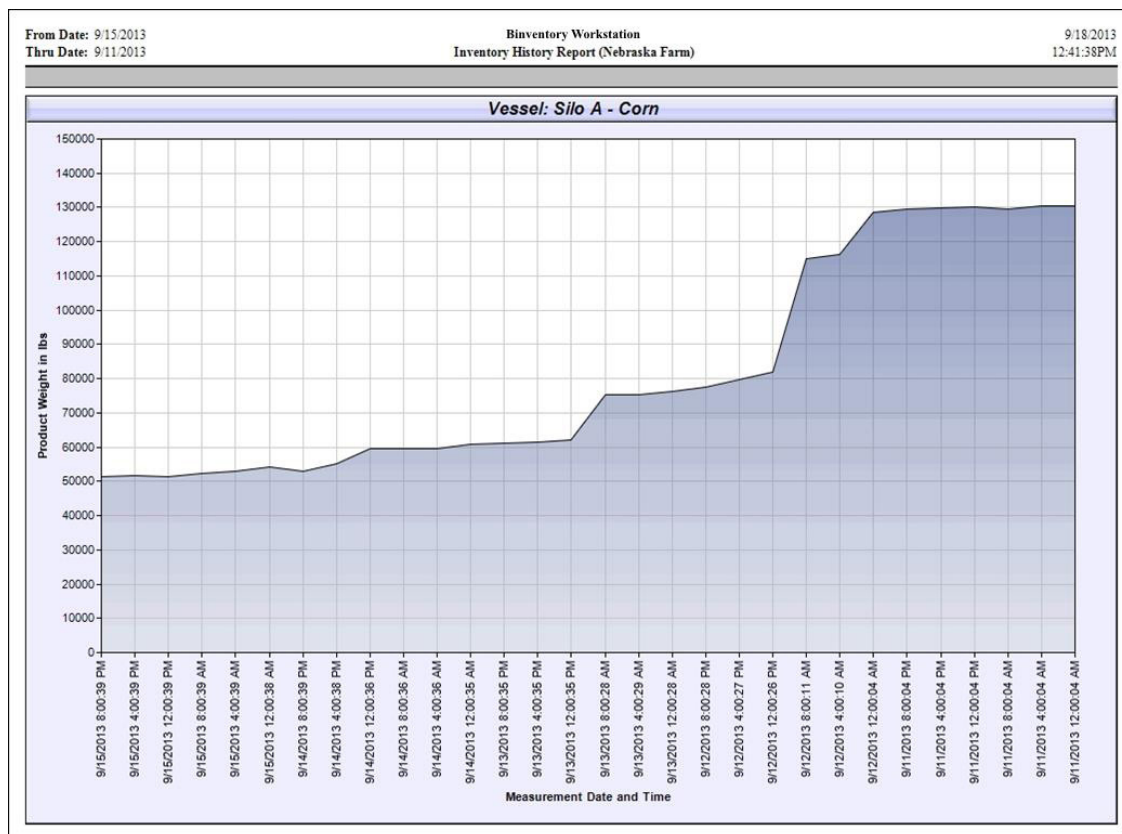


Figure 45

To create a chart on a single vessel's history:

1. Highlight Inventory History Report in the Print Reports screen and click the Select button.
2. Choose the range of data for the chart by clicking on Last 30 Measurements, Last 60 Measurements or Use Date Range.
3. If you chose Use Date Range, specify the From and Thru dates.
4. Select a vessel for the report.
5. Choose the vertical scale for the chart. Pick height, volume or weight for either the product level or the headroom (empty space).
6. Click the OK button to view the report.
7. Once viewing the Crystal Report, go to section **5.4.13.4 Working with Crystal Reports** for details on how to print or convert the report to another file format.

#### 5.4.13.4 Working with Crystal Reports

When viewing a Crystal Report you will have a set of icons or controls along the top left to allow you to print, export and page through a multiple page report. Some of the file formats available for export are Acrobat PDF, Word DOC and Rich Text Format (RTF). Referring to Figure 46 and going left to right, the controls available are as follows:

1. Export Report – click this to export to Acrobat PDF, Word DOC or another format.
2. Print Report – click this to print a hardcopy of the report.
3. Refresh
4. Go to First Page
5. Go to Previous Page
6. Go to Next Page
7. Go to Last Page
8. Go to Page (for specifying page number)
9. Close Current View
10. Find Text
11. Zoom



Figure 46

#### 5.4.14 Site Status Report

A site status report is a report that is automatically emailed as per a schedule and contains the latest readings on each vessel at a site. It includes a small attachment in comma separated values (CSV) file format which contains further details about each vessel.

To create a site status report schedule, click on Email Reports under the Reports menu, then highlight Site Status Report and click the Select button. From within the Site Status Reports screen, click the Add New button. This will open the Site Status Schedule Setup screen where you define a schedule for delivery and assign contacts to receive the report. This scheduler works very much like the measurement scheduler, only you assign contacts to be emailed rather than vessels to be measured.

Example – Refer to Figure 47 for a schedule that will start on 4/21/2018 to email a site status report every weekday morning at 8 AM.

Figure 47

To edit or modify an existing site status schedule, highlight it from within the Site Status Reports screen and click the Select button. Make any necessary changes and click the Save button. Note that site status schedules can be temporarily disabled by un-checking the Schedule Active checkbox.

To delete an existing schedule, highlight it from within the Site Status Reports screen and click the Delete button. You will be prompted to confirm the deletion of the schedule.

### 5.4.15 System Export/Import

System Export under the File menu provides a simple means to export or store your Bininventory system to a compressed file with the DAT extension. It will include all configuration data, but only the last ten readings from each vessel. This file can be considered a backup of your Bininventory configuration and should be created by performing an export following any configuration changes to the system, such as adding a new vessel.

To export or create a backup of your Bininventory system, select System Export under the File menu. The System Export screen will appear with a default filename using today's date and the DAT extension, simply click the Export button to save to file. If a different location or filename is desired, then click the Browse button to navigate to a different location.

System Import under the File menu provides a simple means to load a previously exported system into your Bininventory system. Importing a system will overwrite the current system, so you may want to consider performing an export (as a backup) prior to attempting an import.

To import a system from a previous export, select System Import under the File menu. Click the Browse button, navigate to the DAT file to import and click the Open button. Within the System Import screen, confirm the filename shown is the file to import and click the Import button. After a couple of seconds, it will inform you that it is going to restart the services and Workstation. If this is a networked system, you will have to reboot all remote PC's hosting a site and restart any running Workstations.

System Export and Import are only available if you are logged in as an Administrator User.



## 6 Bininventory Administrator

This section is intended to help you get familiar with the Bininventory Administrator, what it is for and how to use it.

The Bininventory Administrator is a small program included with all installations and is for defining the database connection parameters for the local Bininventory installation. This information must be set correctly in order for Bininventory Workstation and services to connect to the database. The Security Administrator is also for setting the permanent site assignment for the Engine and Scheduler services and, optionally, the initial site assignment for the Workstation.

For a single stand-alone system you should not need to use the Security Administrator, as the default values are defined. However, for each installation of a networked Bininventory system, you will need to use the Security Administrator to configure a connection to the database and set the permanent site assignment for the Engine service.

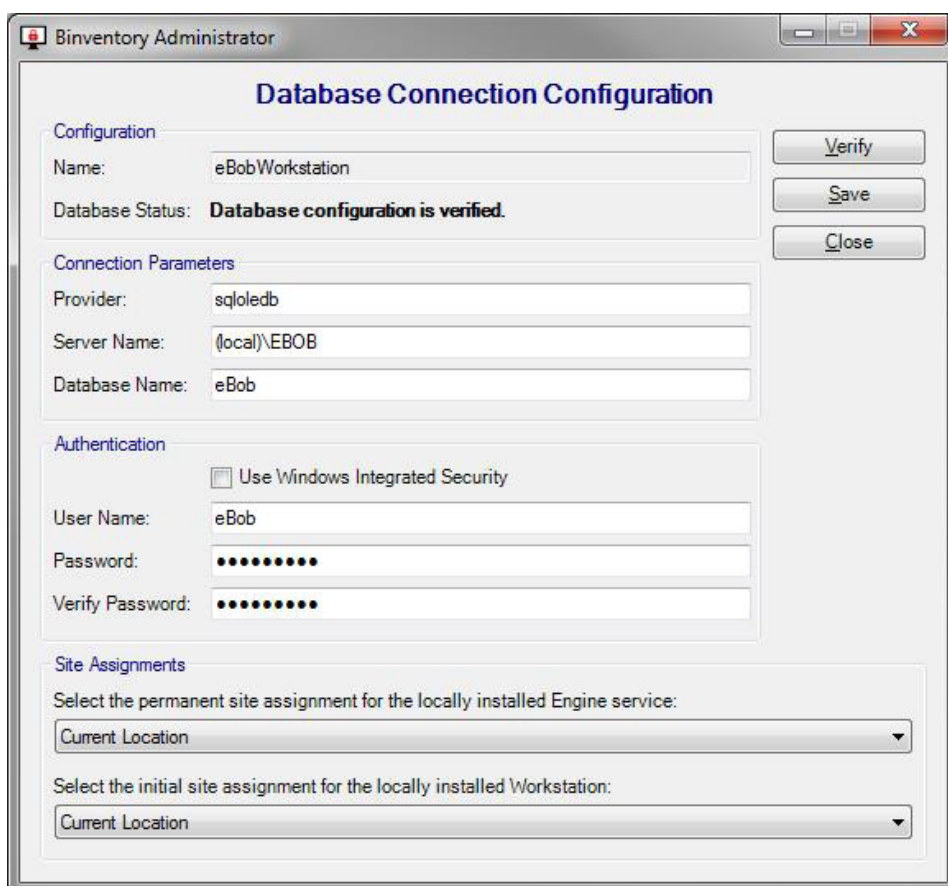


Figure 48

Follow these steps to set up the local Bininventory installation with the required database connection parameters and site assignments.

1. Click on Bininventory Administrator under eBob in the Windows start menu.
2. Change the default path for Server Name to the static IP address or computer name of the PC hosting the SQL database. Referring to Figure 48, the default Server Name is (local)\EBOB and can be left this way only if the database is installed on this PC. Example using an IP address: *192.168.254.100\EBOB*.
3. Enter the default password for user eBob in the Verify Password field. The default password is *B1nM@ster*.
4. Click the Verify button. You should get a confirmation indicating success within a couple of seconds. If incorrect information or authentication is entered, there may be a long pause before receiving indication of a failure.
5. Once connection to the database is verified, you can set the permanent site assignment for the Engine service and the initial site assignment for the Workstation. If this PC is NOT hosting a site, set the permanent site assignment for the Engine service to "Unassigned or engine service not installed." Note that the sites you intend to set these to must have been previously set up.
6. Click on Save to save the site assignments then reboot the PC. The permanent site assignment for the Engine service will not take effect until the PC is rebooted.

## 7 Upgrade from BinMaster IMS

Bininventory 5 does not install over or upgrade an existing IMS v2.2.3 system. If you are migrating to Bininventory 5, you can safely leave IMS v2.2.3 installed on the PC until Bininventory 5 is installed and completely set up.

The minimum system requirements for Bininventory 5 are different than that of IMS v2.2.3, so please verify that your PC meets these requirements as listed earlier in this manual.

IMS v2.2.3 supports only protocol B; however, Bininventory 5 supports both protocol B and the newer protocol A. If your system consists of only SmartBob-II or SmartBob-TS1, it is recommended that you switch to protocol A. Protocol A is more reliable, allows for simultaneous measurements and supports the new Max Drop feature (available with newer SmartBob-II firmware revisions). Please refer to the SmartBob operator's manual for proper protocol jumper setting.

The firmware in the SmartBob-II must be version 2.3 or newer to be compatible with Bininventory 5. If you are intending to use the new Max Drop feature with Bininventory 5, then the SmartBob must contain firmware version 2.8 or newer. Contact BinMaster Technical Support about firmware updates.

## 8 Upgrade from eBob 4

Bininventory 5 does not install over or upgrade an existing eBob 4 system. If you are migrating to Bininventory 5, you can safely leave eBob 4 installed on the PC until Bininventory 5 is installed and completely setup.

The minimum system requirements for Bininventory 5 are different than that of eBob 4, so please verify that your PC meets these requirements as listed earlier in this manual.

## 9 Upgrade from an Earlier Version of Bininventory 5

Bininventory v5.4 will install directly over and upgrade any earlier version of Bininventory 5. However, if you are upgrading a networked system, there are a few important steps to do prior to the upgrade. Determine the type of system you have, single stand-alone or networked, then follow the appropriate steps below to upgrade.

### 9.1 Upgrading a Single Stand-Alone System

Follow these steps if you are upgrading a single stand-alone installation of Bininventory 5:

1. Log into the Windows PC as an administrator.
2. For backup purposes, perform a System Export of the current Bininventory 5 system. From within the Workstation, select System Export under the File menu then click Export to save the system using the default filename. Close the Bininventory Workstation when done.
3. Insert the USB Flash drive (with Bininventory software) into an available USB port. Locate the Bininventory Setup file and run it.
4. Follow the onscreen instructions to complete the software update process.
5. Open up Bininventory Administrator, confirm the database connection parameters, enter the database password and click Verify. Depending on the version of Bininventory you are upgrading from, the default password will either be *eBob* or *B1nM@ster*.
6. Set both site assignments to the existing site in your system and click Save.
7. Reboot the PC.

### 9.2 Upgrading a Networked System

Follow these steps if you are upgrading a networked installation of Bininventory 5:

1. For backup purposes, perform a System Export of the current installation using any of the existing Workstations. From within the Workstation, select System Export under the File menu then click Export to save the system using the default filename. Close the Bininventory Workstation when done.
2. Open up Bininventory Administrator on a PC that is NOT hosting the database and note the contents of the Server Name field. See Figure 49. This may be needed to re-enter into Bininventory after the upgrade.

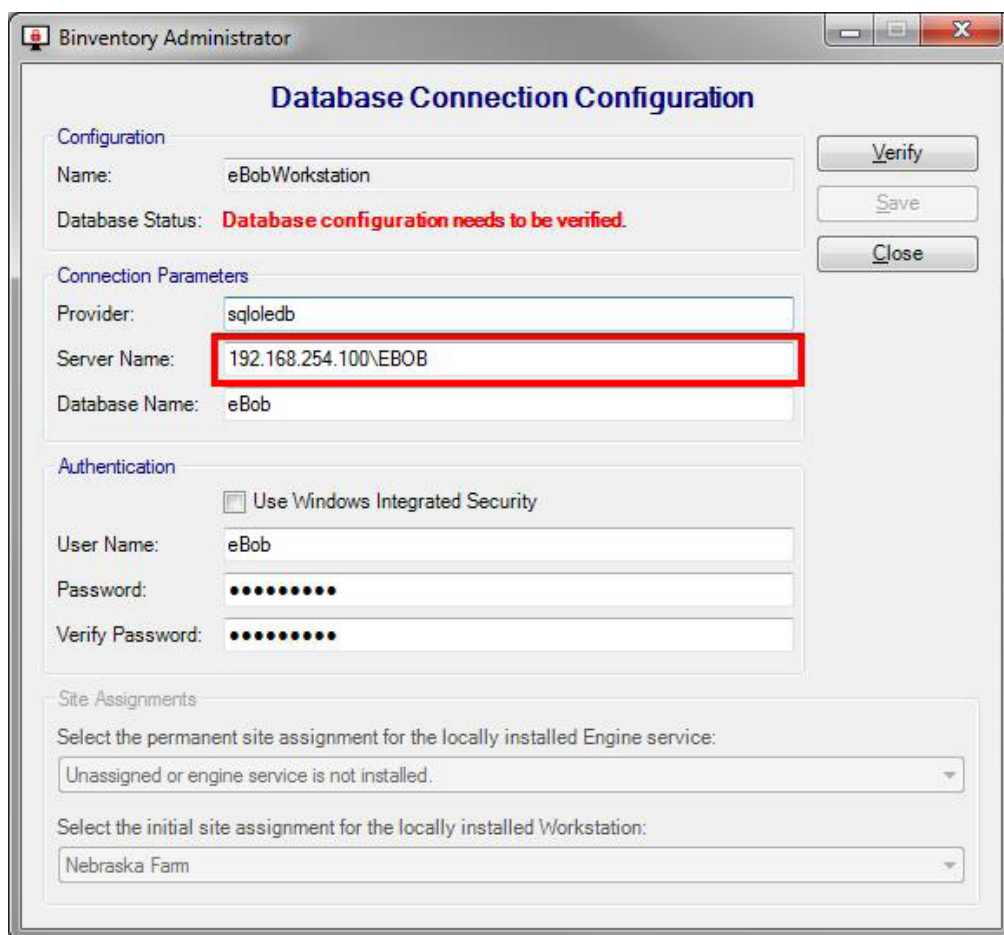


Figure 49

3. Collect the static IP addresses or computer names of each PC hosting a set of Bininventory services (a site). For each PC, if it has a static IP address assigned, retrieve it by typing *ipconfig* at a command prompt on the PC. If it is using DHCP, then retrieve the computer name used to identify this PC on the network.
4. Close Bininventory Workstation on all PC's.
5. Perform the software update first on the PC hosting the SQL server database.
  - a. Log in to the Windows PC as an administrator.
  - b. Insert the USB Flash drive (with Bininventory software) into an available USB port. Locate the Bininventory Setup file and run it.
  - c. Follow the onscreen instructions to complete the update process.
  - d. When the setup process is complete, open Bininventory Administrator, confirm the database connection parameters, enter the database password and click Verify.
  - e. Set the permanent site assignment for the local Engine service. If the Engine and Scheduler services are not installed on this PC, set it to "Uninstalled or engine service not installed."
  - f. Click the Save button to save the configuration.
  - g. Reboot the PC.

6. Follow these steps to enter the static IP address or computer name to each PC hosting a site:
  - a. Open up the Workstation on the PC hosting the SQL server database. This is the PC just updated to v5.4 in step 5.
  - b. Click on Site Maintenance under the Specifications menu.
  - c. Double-click on a site to open it.
  - d. Within Site Setup, replace the default value for Host IP Address (127.0.0.1) with the static IP address or computer name for the PC hosting this site. See Figure 50.
  - e. Click the Save button to save the change and return to Site Maintenance.
  - f. Repeat steps c, d and e for each site listed in Site Maintenance.

**Site Setup - BinInventory Workstation**

**Site Setup**

**Site Details**

Name/Description: Nebraska Farm

Distance Units: Feet

**Company & Location**

Company Name: BinMaster

Street Address: 7201 North 98th Street

City/Town: Lincoln

State/Province/Region: NE

Zip/Postal Code: 68507

Country/Nation: United States

**Engine Service**

Host IP Address: 127.0.0.1

Host Port: 8093

Save Cancel

Figure 50

7. For each of the other PCs with only Bininventory Workstation installed, perform the software update as follows:
  - a. Log in to the Windows PC as an administrator.
  - b. Insert the Bininventory setup CD and run setup.exe.
  - c. Follow the onscreen instructions to complete the update process.
  - d. When the setup process is complete, open up Bininventory Administrator, confirm the database connection parameters, enter the database password and click Verify.
  - e. Set the permanent site assignment for the local Engine service. If the Engine and Scheduler services are not installed, set it to "Uninstalled or engine service not installed."
  - f. Click the Save button to save the configuration.
  - g. Reboot the PC.