

AssetWorx User Guide

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Chapter 1 AssetWorx System Overview

The AssetWorx Typical System Setup is shown in Figure 1-1. Asset records are kept on a central database and may be accessed by any browser through the web server. One or more Alarm Monitoring Service instances manage connections to the RFID portals/V-Tag Gateways and generates alarms for unexpected movements of assets. The AssetWorx Handheld Application running on an RFID scanner is used for periodic inventory of assets.

AssetWorx can be used as either a passive or active RFID system. The passive RFID system uses Gen 2 RFID tags combined with RFID portals and/or RFID handheld scanners. For active RFID, AssetWorx utilizes InfinID Technologies' V-Tag system. V-Tag is an ad-hoc network based RFID system that allows for Location based tracking with very little infrastructure. Please refer to the V-Tag documentation guides for more information.

There are two primary ways to configure AssetWorx. The first way, as shown in Figure 1-1 is to configure it so that all messages are passed through the Web Server's API. The main advantage to this is that messages can be encrypted and connections can be exposed over the internet. The other way is to configure each client (such as the Alarm Monitoring Service) to use simple database connections. With this method, although the configuration is simpler and there is less network overhead, it can only be configured through the Local Area Network.

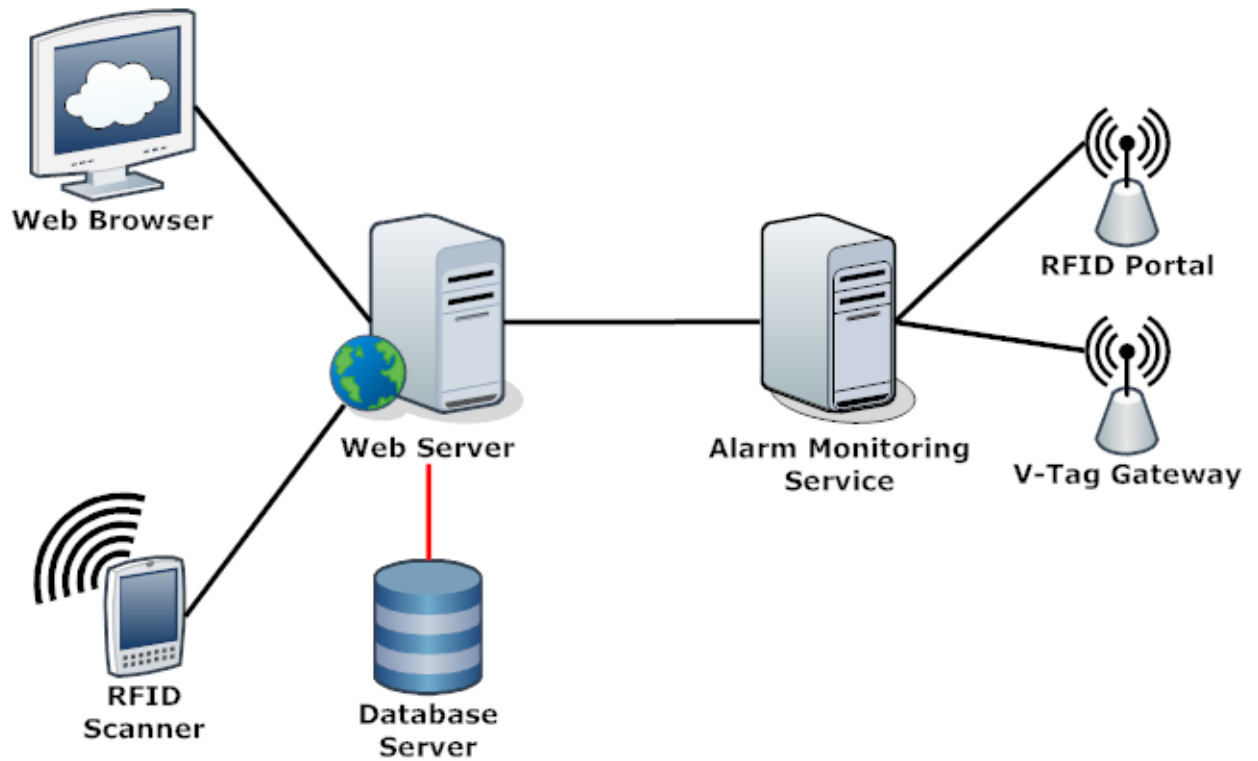


Figure 1-1 AssetWorx Typical System Setup

AssetWorx uses a central database to store asset records. A typical asset record displayed in the AssetWorx client software is shown in Figure 1-2, including the date, time and location of where the asset was last seen.

The AssetWorx software suite also includes the AssetWorx handheld application. Some screen captures for the AssetWorx handheld application running on the Motorola MC333R are shown in Figure 1-3.

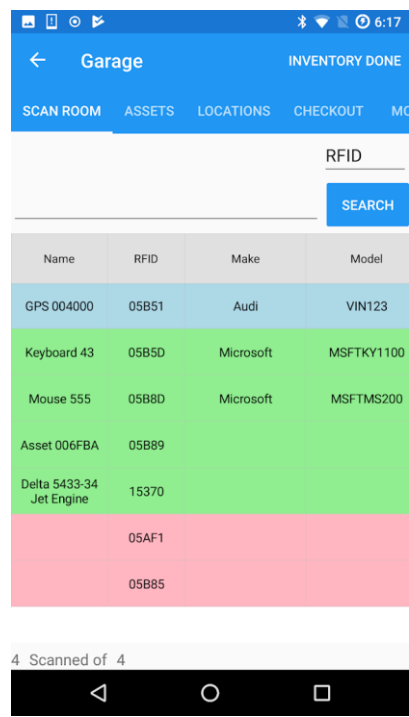


Figure 1-3 AssetWorx Handheld Application

The AssetWorx handheld application can run on either Android or iOS. Supported devices at the moment are the Zebra MC333R and the CLS CS-108 sled unit.

The AssetWorx handheld app lets users perform periodic inventories. The user selects a location using either barcode or RFID tags. The software will then present the user with a list of assets expected at that location. As each expected asset is scanned, the color changes from orange to green. Assets from different locations are shown in blue. Assets not present in the database are shown in pink. The user can also modify the asset records using the handheld. The app can operate in Connected mode or Batch Sync mode.

Chapter 2 Installation Planning

The AssetWorx asset tracking system relies on many individual components working together to provide a complete solution. The following issues should be addressed before installing AssetWorx

Where will RFID portals be positioned?

RFID portals may be positioned at warehouse entrances, building entrances, store room entrances or other strategic points to track movements of assets within an enterprise. An RFID portal can have its power adjusted to cover a distance of zero to twenty five feet in a particular direction.

How many RFID portals will be needed?

In general, you will need one portal attached to two antennas for each entrance to be monitored. One antenna will be at the left of the entrance and another antenna to the right. The maximum distance between the RFID portal and each antenna should be fifteen feet. The minimum distance between the RFID portal and human personnel should be nine inches. Some installations may track assets using handheld RFID readers only and consequently have no portals.

Is a power connection and an Ethernet connection required at each portal location?

Check the specifications for the RFID portal for this. Some portals can operate with POE in which case one network cable may be sufficient.

How many RFID printers will be needed?

If you plan to use inexpensive RFID paper labels to track assets, you will need an RFID printer and label design software. We recommend Zebra RFID printers and BarTender RFID Enterprise Edition label design software.

What information will be printed on each label?

For asset labels, the Asset Name and a barcode of the Asset Name should be printed on each label. For location labels, the location name and a barcode of the location name should be printed on each label. Optionally, additional information such as asset description, asset serial number and RFID tag number may be printed.

How many Handheld RFID readers will be needed?

Typically one reader is needed per site to cover all of the buildings at that site. Reading RFID tags is much faster than reading barcodes, since a room can be scanned using a single sweep of the RFID reader.

What database will be used to store the asset information?

AssetWorx can work with either a Microsoft SQL Server or PostgreSQL database. PostgreSQL is free. For Microsoft SQL Server, you can either install the free version called SQL Server Express or use an existing licensed database server. Your IT department should be consulted to assist with this decision.

How will the database be synchronized with the fixed asset financial database?

AssetWorx provides an import feature to import a list of assets from a fixed asset financial database using CSV (Comma Separated Values). Alternatively a custom solution for periodic database synchronization could be developed using professional services.

Are any of the assets being tracked made of metal?

Metal interferes with the reading of RFID tags. If any of the assets being tracked are made of metal, or have a metal exterior, then special metal mount tags must be used. These tags must be bulk programmed at the factory, or else programmed individually using the Motorola handheld RFID reader.

Is there space on the asset for the RFID tag?

Asset scanning using RFID tags will work best if the tag stays horizontal and facing the person doing the scanning. Paper RFID labels are typically 4in x 1in or larger and can be read from a distance of twenty feet. Metal mount tags come in a range of sizes. The larger metal mount tags are 4in x 1in and can be read from a distance of twenty feet. The smaller metal mount tags are 1.5in x 0.7in and can be read from a distance of six feet.

Which tag serialization scheme will be used?

All of the RFID tags used by our system store a 96 bit serial number which translates to a 24 digit hexadecimal number. AssetWorx will accept RFID tags with any formatting, but provides its own serialization system for printing. These options are described in more detail in Chapter 3 “RFID Tags.”

How do I get the 24 digit hexadecimal number of the RFID tag into AssetWorx?

There are several approaches to this. If you are using label RFID tags, you can print the tag directly which will both program the RFID tag value and save it to the database. If you are using tags that can't be printed, you can utilize the Associate Asset screen on the handheld app to do the association manually.

Chapter 3 RFID Tags

3.1 Label, Metal Mount Tags, and V-Tag

RFID Tags come in several form factors:

- Label – for placing on non-metal and non-liquids
- Metal Mount – for placing on metal or liquids
- V-Tag – for active RFID tracking

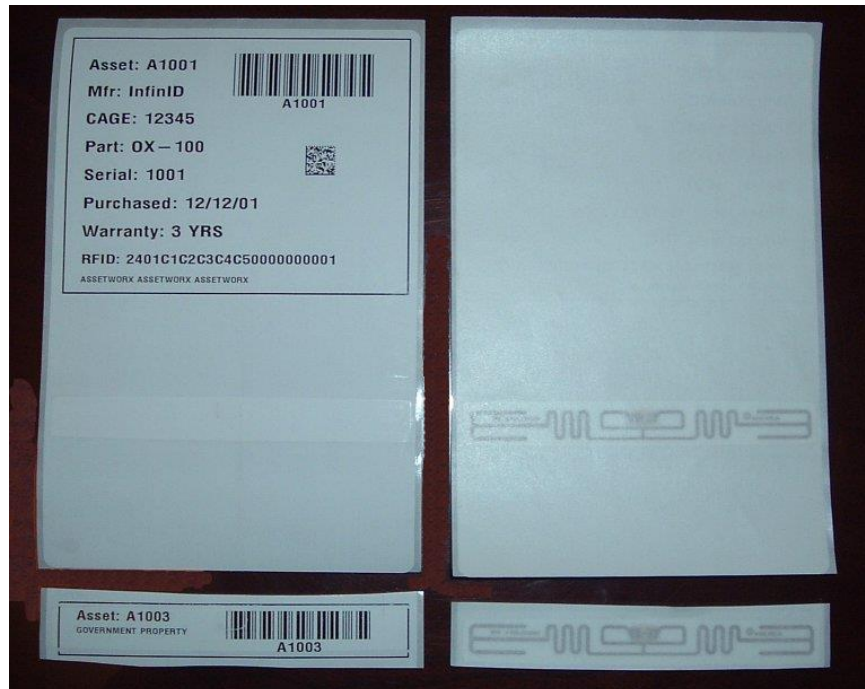


Figure 3-1 Label Tags – Note the RFID Tag Inlay on the back

The Metal Mount tags include a foam or plastic backing that increases the tag read efficiency in the vicinity of metals or liquids.



Figure 3-2 Sample Metal Mount Tag

V-Tags are active tags that are enclosed by a hard plastic shell. They come in many form factors, can be applied to any material and require no RFID portal to act as an interrogator.



Figure 3-3 Sample V-Tag

EPCGlobal Class 1 Gen 2 tags are recommended for use with AssetWorx, since these give improved performance over the older Class 1 Gen 1 tags. The tags can store 96 bits of asset identification information. Tags can be pre-programmed at the factory and bought in bulk.

AssetWorx will accept RFID tags with any formatting, but provides its own non-standardized serialization formula for printing location and asset tags

3.2 *Generating Label Tags*

The steps for generating label tags are:

- Design your tag print template using Bartender or an equivalent package.
- Incorporate AssetWorx variables into your tag print template.
- Set up the Template record in AssetWorx.

Then use the "Batch Print" button to batch print tags or the "Print Label" button to print a single tag.

Please refer to the [Printing With AssetWorx](#) document for more details.

3.3 *AssetWorx Variables*

The following variables are automatically updated by AssetWorx for each asset label being printed.

lblname	Asset Name
lbldescription	Asset Description
lbldepartmentcode	Department Code
lblasettype	Asset Type
lbllocationname	Location Name
lblvtagid	V-Tag ID

All Asset additional fields are also available for printing. The variable naming convention is simply how the field shows up in the Additional Fields section of the Edit Asset screen with no spaces all lower case.

The following variables are automatically updated by AssetWorx for each location label being printed.

lblname	Location Name
lbldescription	Location Description
lblbuilding	Building
lblfloor	Floor
lblroom	Room

lblsite

Site

lblrfidtag

RFID Tag

Chapter 4 Company Setup

AssetWorx supports a multi-tenant architecture. This means that multiple companies or divisions of a company can operate within AssetWorx with complete data isolation from each other. This makes using AssetWorx in a large enterprise very effective.

4.1 Managing Companies

By default, only one Company record is added to AssetWorx with the name “Main Company”. The Company records can be modified by going to Tools->Options->Companies.

Edit Options

[Save Changes](#)

[Format Options](#) [Auto Trim Options](#) [Asset Name Serialization](#) [MQTT](#) **[Company Settings](#)**

AssetWorx supports a multi-tenant architecture. Each company record will provide data isolation throughout the system. Only Super Admins can modify company records.

Companies

✓	Name	
✓	Main Company	

[+ Add](#) [Edit](#) [Delete](#)

By default, only the SuperAdmin user can modify Company and User records. The default password for SuperAdmin is “demo”. The SuperAdmin user also has the ability to view all data spanning across multiple Companies within the database.

Keep in mind that deleting any Company record will also delete ALL data associated with that record spanning all database tables.

4.2 Managing Users

Only the SuperAdmin user can modify user records. In addition to the SuperAdmin user, there is also a default “admin” user with the default password of “demo” that has administrative rights for Main Company. Additional users can be created for various Companies which can be either administrator or View Only.

Edit User

Save

Cancel

Company

Main Company

Username

mblaterly

+ Set Password

First Name

Michael

Last Name

Blaterly

Email

mblaterly@capsulecorp.com

Phone Number

Phone

Card ID

Card ID

RFID Tag

Room

☐ View Only User

Chapter 5 Asset Names and Location Names

Assets are tracked using Asset Names. These can be up to 50 characters in length. A sample Asset Name may be “A0001.” If an asset contains multiple modular parts, then these parts should be entered as separate records in AssetWorx. For example, a workstation containing a CPU, monitor and keyboard and printer may have 4 records in AssetWorx, A0007-1 for the CPU, A0007-2 for the monitor, A0007-3 for the keyboard and A0007-4 for the printer.

Locations are tracked using Location Names. These can be up to 50 characters in length. A sample Location Name may be “1-200”, which indicates building number 1, room 200.

Chapter 6 Adding Information to AssetWorx

6.1 Add/Edit Asset

The Asset record holds details of the item that you are tracking. The selectable tabs are:

- General
- Additional
- Maintenance
- Location History
- Check Out History

General

Asset Name	Asset Name represents the unique identifier for the asset. Asset Name can be up to 50 characters long.
Asset Type	Asset Type represents the asset type (e.g. furniture, electronics). Asset Type can be up to 50 characters long.
Description	Description represents the asset description. Description can be up to 255 characters long.
RFID Tag	RFID Tag represents the hex encoding of the RFID tag on the asset (e.g. 2401C1C2C3C4C50000000024). If present, the RFID Tag must be exactly 24 hex characters long, which corresponds to a 96-bit passive RFID tag. If you print a label and this field is blank, the next incrementing tag number will be inserted.
V-Tag ID	V-Tag ID represents the unique ID value of your V-Tag. It is a 6 digit hexadecimal number. The V-Tag ID can be found on the front face of your V-Tag.
Location	Location represents the asset location.
Gateway	This represents the V-Tag Gateway that the asset is assigned to. This value will be set automatically when the V-Tag reports to the gateway.
Last Observed Location	Last Observed Location is filled in automatically by AssetWorx based on RFID tag reads either by portals or by the handheld RFID reader.
Last Observed Time	Last Observed Time is filled in automatically by AssetWorx based on RFID tag reads either by portals or by the handheld RFID reader.

Alert If Unseen For	Alert If Unseen For enables popup alerts on the Administration screen if the asset RFID tag has not been RFID scanned for some preset period of time. Be sure that the Alarm Monitoring Service is running so that the popup alerts are generated.
Check In Status	Check In Status is one of "Checked In" or "Checked Out".
Department Code	Department Code represents information on the department responsible for this asset (e.g. Finance, HR). Department Code can be up to 50 characters long.
Checked Out To	Checked Out To represents the individual that the asset is checked out to. Checked Out To can be up to 50 characters long.
Print	Use the Print button to print a label for the asset. Be sure that a print template is created prior to printing.
Additional Information	Additional Information represents additional information for the asset. Additional Information can be up to 5000 characters long.

Custom Fields

Under the Additional Fields tab, AssetWorx provides 14 custom text fields, 5 custom combo fields and 5 custom date fields. The custom text fields can each be up to 500 characters long. The custom combo fields are numbers up to 50 characters long.

Use "Tools -> Custom Field Names" menu option to set the display names as well as order for each field.

Picture

Under the Picture tab, AssetWorx allows the user to upload a custom picture of their asset. This picture can be displayed on the browser as well as the handheld app.

Children

Under the Children tab, AssetWorx allows the user to define any assets which should be considered children of the parent asset. Children assets are treated differently in AssetWorx compared to regular assets. A child asset will only have its location updated when the parent asset location is changed.

Maintenance

Disposal Status	Disposal Status indicates whether an asset is in-service or disposed. When an asset reaches the end of its life, you can change its status to disposed.
Disposal Method	Disposal Method is the method chosen to dispose of the asset. Disposal Method can be up to 50 characters long.
Disposal Date	Disposal Date is the date that the asset was disposed.
Disposal Destination	Disposal Destination is where the disposed asset was transferred to. Disposal Destination can be up to 50 characters long.
Maintenance Schedule	Maintenance Schedule is one of: No Maintenance, Periodic or Single Event. To create a single maintenance action, select the Single Event option. To create a recurring action, select the Periodic option.
Starting	Starting is the first scheduled maintenance of a recurring maintenance activity.
Every	Every is the interval of a recurring maintenance activity in months.
Once Only On	Once Only On is the maintenance date of a single event scheduled maintenance.
Next Due	Next Due is the next scheduled maintenance date for this asset and is calculated automatically every time the maintenance tab is displayed, or changes are made to the maintenance schedule. Be sure to register changes by tabbing to a different field.
Maintenance History	Maintenance History provides a convenient way to view the log of maintenance actions. Every time that the operator carries out a scheduled maintenance action using the operator screen, a new log entry is added.

Location History

Location History provides a history of tag reads for this asset. Location History is filled in automatically by AssetWorx based on RFID tag reads either by portals or by the handheld RFID reader.

Check Out History

Check Out History provides a history of check-in and check-out operations for this asset.

6.2 *Add/Edit Location*

The location record holds details of locations.

Name	Name is a descriptive name for this location. Name can be up to 50 characters long. This name will appear on selection menus in other AssetWorx windows, so it is important to select a unique concise descriptive name.
Site	Site represents the site information. Site can be up to 50 characters long.
Building	Building represents the building information. Building can be up to 50 characters long.
Floor	Floor represents the floor information. Floor can be up to 50 characters long.
Room	Room represents the room information. Room can be up to 50 characters long.
Description	Description represents the location description. Description can be up to 255 characters long.
RFID Tag	RFID Tag represents the hex encoding of the RFID tag of the location (e.g. 2402C1C2C3C4C500000000004). If present, the RFID Tag must be exactly 24 hex characters long, which corresponds to a 96-bit passive RFID tag. If you print a label and this field is blank, the next incrementing tag number will be inserted.
Print	Use the Print button to print a label for the location. Be sure that a print template is created and imported into AssetWorx prior to printing. See Section 3.2 "Generating Tags."

6.3 *Add/Edit User*

Each person that logs into AssetWorx will need to have a user record. All operations performed by a user of the system are logged using the username specified in their user record.

Username	The name that the user must login to AssetWorx with.
Password	The Password pop-up screen displays, allowing you to enter and confirm the password. The text of the password is masked with asterisks (*).

First Name	The first name of this user.
Last Name	The last name of this user.
Email	The email address of the user.
Phone	The primary phone number of the user.
Card ID	Card ID is used by the RADS module which allows a user to scan a proximity card to identify themselves with the system so that they can check items and or out.
RFID Tag	Adding an RFID tag to a user allows the Alarm Monitoring System (AMS) to associate the user with the Check In/Check Out Alerting Actions. If these Alerting Actions are assigned, the AMS will automatically look for a User RFID tag within a window of activity to associate with the Check In/Check Out

6.4 *Add/Edit Reader*

The Reader record holds details of the RFID portal readers in the system. The selectable tabs are:

- General
- COM Port
- Network Details
- Properties

General

Name	Name is a descriptive name for this RFID portal reader. Name can be up to 50 characters long. This name will appear on selection menus in other AssetWorx windows, so it is important to select a unique concise descriptive name.
Maker	Maker is the manufacturer of the reader.
Model	Model is the model of the reader.

Connection	Connection is one of "COM Port" or "Network" depending on the reader make and model.
Location	Location represents the reader location. See Section 6.2 "Add/Edit Location" for details of adding or editing locations.
Use With AMS Service	This value must be set to the computer name that the AMS is running off of to make it so that only that AMS instance tries to connect to this Reader.
On Tag Movement	Any RFID tag read by this reader will apply the selected Alerting Action to the assigned asset.
On Low Battery Sensor	Any V-Tag that sends in a low battery signal will apply the selected Alerting Action to the assigned asset.
On Sensor Over Threshold	V-Tags allows users to define thresholds for sensor data such as temperature, light levels, and shock. The selected Alerting Action will be applied to these threshold events.
On Inner Direction Detected	Some readers, such as Impinj, support the ability to report directionality with their RFID reads. The selected Alerting Action will be applied to Inner Direction RFID reads.
On Outer Direction Detected	Some readers, such as Impinj, support the ability to report directionality with their RFID reads. The selected Alerting Action will be applied to Outer Direction RFID reads.
Antenna Alerting Rules	Many RFID readers support attaching multiple antennas. The Antenna Alerting Actions allow the user to assign each antenna a specific Alerting Action and Location. An RFID tag being read by an antenna with an Antenna Alerting Rule will override any Alerting Action assigned in the On Tag Movement section.

COM Port

COM Port settings will be enabled if Connection is set to "COM Port" in the Reader tab.

Port	Port is the COM port on which the reader is attached.
Baud Rate	Baud Rate is the COM port baud rate. Usually the value displayed is a good default for attaching new readers based on the selected maker and model.
Handshake	Handshake is the COM port handshake arrangement. Usually the value displayed is a good default for attaching new readers based on the selected maker and model.

Network Details

Network Details will be enabled if Connection is set to "Network" in the Reader tab.

IP Address

If the reader supports device discovery, then you can press the device discovery button to discover the reader. Otherwise just type in the IP address (e.g. 10.10.10.10). You should try to use a static IP address instead of a DHCP automatically assigned address for your readers, otherwise the reader will need to be re-discovered every time that power is removed. Talk to your network administrator to obtain a static IP address for the reader. Another option is to use the computer hostname instead of an IP Address.



Device Discovery Button

IP Port

IP Port represents the IP Port used to connect to the reader. Usually the value displayed is a good default for attaching new readers based on the selected maker and model.

Username

Username represents the username for logging in to the reader. Usually the value displayed is a good default for attaching new readers based on the selected maker and model.

Password

Password represents the password for logging in to the reader. Usually the value displayed is a good default for attaching new readers based on the selected maker and model.

Properties

The properties tab contains any properties that may vary on a per device basis. For instance, with the Symbol XR400 reader, one of the properties is the "Tag Timeout" measured in seconds. This is the time that must elapse between duplicate read events for a tag that stays in the read field of a particular Symbol XR400 portal reader.

6.5 *Add/Edit Alerting Action*

Alerting Actions in AssetWorx define actions to be taken by the AssetWorx Alarm Monitoring Service in response to certain events such as Tag Movement, Asset Unseen Threshold, and a variety of V-Tag related events. Alerting Actions are typically assigned in the Edit Reader screen, but also can be assigned in the Edit Asset screen.

Name	Name represents the name of this alerting action. Name can be up to 50 characters long.
Log Alarm	If checked, an alarm is added to the alarms table in the database.
GPO	If checked, will set the appropriate GPO to either High or Low a specific number of seconds. Useful for things like flashing a light stack or siren.
Check In	If checked, the asset associated with the RFID tag will be checked in.
Check Out	If checked, the asset associated with the RFID tag is checked-out. The reader name is automatically filled in for the "Checked-out to" field. If a user badge is seen within 20 seconds before or after an asset tag, then that asset will be checked out to that user. If no user badge is seen, the asset will be checked out to the RFID reader. There may be a five minute delay before this transaction is processed.
Admin Popup	If checked, an alarm popup window appears for any user logged in to AssetWorx. The user can then acknowledge the alarm.
Email	An email will be sent out using the settings specified under AssetWorx! Settings.
Change Location	If checked, the location of the asset is changed to be the RFID reader location of the RFID reader that read the asset.
Automatically Acknowledge Alarm	If checked, AssetWorx will automatically add an alarm acknowledgement removing the need for a user to press the acknowledge button on an administration popup window.
Apply actions to checked in items only	If checked, the action is skipped if the asset record indicates that the item has been already checked out to a user. This could be useful if you are only concerned about detecting non checked-out items leaving the premises.

6.6 Add/Edit Template

Print templates define who will be responsible for printing the template as well as what print engine should be used. AssetWorx can be configured to use either the Alarm Monitoring Service or the Enterprise Print Client to print. Templates are used for defining print jobs for both Assets and Locations. Please refer to the [Printing with AssetWorx](#) document for more detailed information.

Name	Name represents the template name. Name can be up to 50 characters long.
Print Type	Choose either Asset or Location.
Print Method	Bartender if using the Bartender printing engine. File if printing to CSV file for processing.
File Path	If printing with Bartender, this should point directly to the Bartender BTW file. If File printing, this should be set to the directory you wish to put your CSV files in.
Use With Service	If you are using the Alarm Monitoring Service to print, this should be set to the computer name of the Alarm Monitoring Service.
Use With Print Client	If you are using the Enterprise Print Client, choose the print client specified in Tools->Options-MQTT under Print Clients.

6.7 Add/Edit Alarm Acks

Alarm Acknowledgements are used to ignore tag read events based on the RFID tag being reported.

Name	Name represents the name of the event filter. Name can be up to 50 characters long.
RFID Tag	RFID Tag contains the 24 character RFID tag identifier or the 6 character V-TAG tag identifier.
Event Type	Event Type is the event type being acknowledged.
Threshold Type	Threshold Type is threshold type being acknowledged.

Alarm acknowledgements are created automatically when you acknowledge an alarm. The alarm acknowledgement filters out all further event reports of that event type for that

tag. You must manually delete the alarm acknowledgement to resume alarm reporting for that event type for that tag.

6.8 *Add/Edit Plugin*

AssetWorx allows a user to upload customizable plugins into the system. Uploaded plugins will show up in Alerting Actions.

Name	The name that the plugin should show up as.
Description	A brief description of what the plugin does.

Chapter 7 Custom Fields

AssetWorx provides 20 custom text fields, 5 custom combo box fields and 5 custom date fields. The custom text fields can each be up to 500 characters long. The custom combo box fields can be up to 50 characters long.

Save Changes

Custom Fields For Web

Move UpMove Down

Name	Value	Display
asset.listvalue1	condition	true
asset.text1	supplier	true
asset.text2	purchase order no.	true
asset.date1	purchase date	true
asset.text3	acquisition cost	true
asset.text4	manufacturer	true
asset.text5	part number	true
asset.text6	serial number	true
asset.date2	warranty begins	true
asset.date3	warranty ends	true
asset.text7	warranty provider	true
asset.text8	text 1	true
asset.text9	text 2	true
asset.text10	text 3	true

Display Value

purchase order no.

☒ Display

Custom Fields For Handheld

Move UpMove Down

Name	Handheld Value	Handheld Display
asset.listvalue1		false
asset.text1		false
asset.text2	Pur. Order No.	true
asset.date1		false
asset.text3		false
asset.text4		false
asset.text5		false
asset.text6		false
asset.date2		false
asset.date3		false
asset.text7		false
asset.text8		false
asset.text9		false
asset.text10		false

Display Value

Pur. Order No.

☒ Display

Figure 7-1 Custom Field Names

Use "Tools -> Custom Field Names" menu option to set the names for each field, as shown in Figure 7-1.

Chapter 8 Alarms and Events

8.1 Events

The events screen provides a real-time updated list of tags read by the RFID portals.

Event Time	Date and time of the RFID tag read
RFID Tag	The ID of the RFID tag or V-TAG tag.
Reader Name	The name of the RFID portal reader or V-TAG gateway reporting the event.

Reader Location	The location of the RFID portal reader or V-TAG gateway reporting the event.
Asset Name	The name of the asset associated with the event.
Asset Description	The description field for the asset associated with the event.
Event Type	The event type, one of "Asset Unseen Timeout", "Asset Moved", "User Badge Read", "Sensor Threshold Exceeded", or "Low Battery".
Threshold Type	The threshold type, one of "Temperature Upper", "Temperature Lower", "Humidity Upper", "Humidity Lower", "Acceleration Upper" or "Battery"
Event Details	For "Asset Unseen Timeout" this contains the actual time since the asset was last seen. For "Sensor Threshold Exceeded" this contains the actual sensor reading and the configured threshold for the sensor reading.
Event Annotations	Event annotations may be added by Custom Event Filters if installed.
Antenna Number	The antenna number of the RFID reader which picked up the RFID tag. Some readers have a single antenna. Some readers have multiple antennas.
RSSI	The received signal strength indication, usually measured in dBm. If measured in dBm, this number typically varies from +20 dBm (strong reading) to -100 dBm (weak reading).
Auto Update	If auto-update is selected, this screen will update every 20 seconds.

Events that have been filtered by alarm acknowledgements will not appear in the list. See Section 6.9 “Add/Edit Alarm Acknowledgement” for the procedure of how to set up an alarm acknowledgement.

You can sort the list by clicking on the column headings. If a tag stays in the vicinity of a reader, AssetWorx will continue to log new events for this tag. You can use the Add/Edit Reader screen to configure how often duplicate events keep occurring. Be sure that the Alarm Monitoring Service is running so that the display is correctly updated.

8.2 Alarms

The alarms screen contains a real-time updated list of alarms. These alarms are triggered by either:

- Alarm Rules defined in Add/Edit Alarm Rules
- Time-outs defined on a per-asset basis in the Asset Screens (General Tab)

The following fields are reported:

Alarm Time	Date and time of the alarm.
RFID Tag	The ID of the tag that generated the alarm
Reader Name	The name of the RFID portal reader. For time-outs, this will be blank.
Reader Location	The location of the RFID portal reader or V-TAG gateway reporting the alarm.
Asset Name	The name of the asset associated with the alarm.
Asset Description	The description field for the asset associated with the alarm.
Alerting Action Name	The name of the alerting action that converted the raw event into an alarm.
Event Type	The event type, one of "Asset Unseen Timeout", "Asset Moved", "Sensor Threshold Exceeded", or "Low Battery".
Threshold Type	The threshold type, one of "Temperature Upper", "Temperature Lower", "Humidity Upper", "Humidity Lower", "Acceleration Upper" or "Battery"
Event Details	For "Asset Unseen Timeout" this contains the actual time since the asset was last seen. For "Sensor Threshold Exceeded" this contains the actual sensor reading and the configured threshold for the sensor reading.
Antenna Number	The antenna number of the RFID reader which picked up the RFID tag. Some readers have a single antenna. Some readers have multiple antennas.
RSSI	The received signal strength indication, usually measured in dBm. If measured in dBm, this number typically varies from +20 dBm (strong reading) to -100 dBm (weak reading).
Auto Update	If auto-update is selected, this screen will update every 20 seconds.

You can sort the list by clicking on the column headings. You can acknowledge the alarm to prevent it from reoccurring. Be sure that the Alarm Monitoring Service is running so that the display is correctly updated.

8.3 Alarm Acknowledgement

If an alarm happens, and the triggering rule calls for an Administration Popup window, the Alarm Notifier window shown below will be displayed.

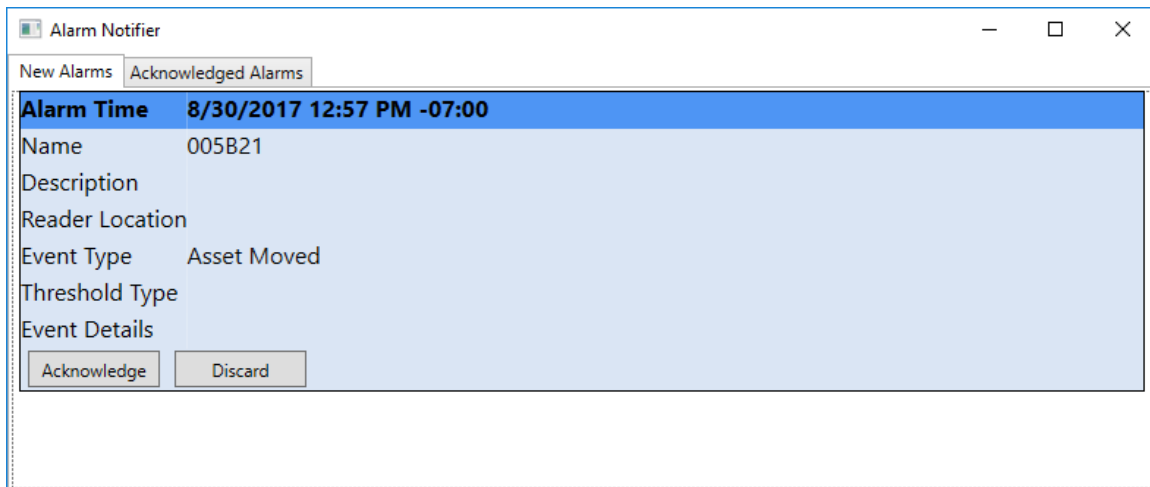


Figure 7-1 Alarm Acknowledgement

An Alarm Acknowledgement is created automatically when you Acknowledge an alarm. The Alarm Acknowledgement filters out all further event reports from that RFID portal for that tag. You must manually delete the Alarm Acknowledgement under the Acknowledged Alarms tab to resume alarm reporting for that tag. To remove the alarm without creating an Alarm Acknowledgement, click the Discard button.

8.4 Network Management

The network management screen provides a real-time display of the connectivity of the RFID portals.

Alarm Monitoring Service Status

Name	Version	Last Seen
Barry-PC	4.0	05-29-2020 14:32:32
Jonathan-PC	4.0	05-29-2020 14:26:30

Reader Status

Name	Last Seen	Use With Service
00800000a0004f68	05-29-2020 14:32:35	00800000a0004f68
Office Ground Gateway	05-29-2020 14:26:17	
XPortal 10.2.76.43	05-29-2020 14:26:17	
XPortal 10.2.76.42	05-29-2020 14:26:17	
VR Gateway	05-29-2020 14:26:17	Barry-PC

Figure 7-2 AssetWorx Network Management

The top part of the screen shows the total number of Alarm Monitoring Service Instances that are running. There would typically be one AMS installed per site location.

The bottom part of the screen shows the current connection status of each Reader or Gateway configured in the system.

8.5 Alarm Monitoring Service

The Alarm Monitoring Service is part of AssetWorx that runs as a Windows service in the background. The Alarm Monitoring Service has the following functions:

- The Alarm Monitoring Service establishes a connection to all of the RFID portal readers. If a connection to a reader fails, the Alarm Monitoring Service will periodically try to re-establish the connection.
- The Alarm Monitoring Service reads raw events from the RFID portal readers and then checks them against filters and rules to see whether any alarms should be triggered.
- For every asset that has an alarm if not seen, the Alarm Monitoring Service will generate an alarm if that asset has not been seen for the specified time period.
- The alarm monitoring service also checks the database periodically for any configuration changes.

If you are doing database maintenance and you wish to stop the Alarm Monitoring Service, you can do that from the Windows Administrative Tools Control Panel by double-clicking on Services, selecting the Alarm Monitoring Service and selecting Stop. See Figure 7-3.

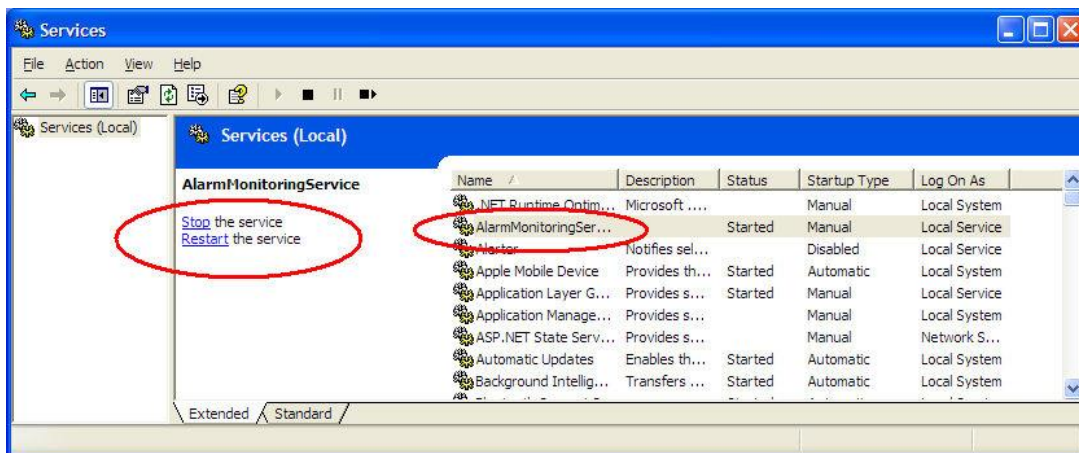


Figure 7-3 Windows Services Control Panel

By default the Alarm Monitoring Service will write any error messages to a log file under c:\Logs on the computer that the AMS is running on. You may need to create the Logs directory manually if you want to enable logging.

Chapter 9 V-Tag Commands and Sensors

9.1 V-Tag Commands

The V-Tag Commands screen displays a list of recently run commands that were sent to one or more of the V-Tag gateways. It is the V-Tag Gateways responsibility to send these commands out to the network to make sure that they are run successfully. This is facilitated through the Alarm Monitoring Service. Commands can be sent out through the [V-Tag Command Center](#).

V-Tag ID	The ID of the V-TAG active RFID tag that is being addressed.
Asset Name	The Asset Name associated with the V-TAG active RFID tag.
Command Type	The type of command that is being issued.
Status	The status, one of "In Progress", "Success", "Failed"
Command Text	The actual text of the command that will be sent out.
Last Attempt	The date and time of the last retry attempt.
Created	The date and time when the command was created by AssetWorx

9.2 V-Tag Sensors

The V-TAG Sensors screen contains a list of sensor reports that are reported once an hour by default for each V-Tag in the network.

V-Tag ID	The ID of the V-TAG active RFID tag that is being addressed.
Timestamp	The date and time that the sensor report came in on.
X	Current X coordinate in meters. Tag positions are calculated once every 30 seconds based on RSSI measurements from neighbors.

Y	Current Y coordinate in meters. Tag positions are calculated once every 30 seconds based on RSSI measurements from neighbors.
Z	Current Z coordinate as a floor number (-127 to +127). The Z coordinate is calculated as an average of the Z coordinate of neighbor tags.
Position Type	Position Type indicates whether this is a Fixed Position tag or Asset tag.
Source Distance Hops	Source Distance is the number of hops to the nearest gateway for this V-TAG active RFID tag. It is based on communications with tag neighbors. For example, if the tag hears reports from a set of neighbors, and the neighbor with the lowest source distance reports a distance of 4 to the nearest gateway, this tag will then report a distance of 5. If there are many tags in an area, a tag may decide to become a leaf node and not do any relaying functions. In this case, it reports a source distance of 255, which represents a "Leaf".
TTL	When a tag sends a sensor report to the gateway, it initializes the TTL (Time to Live) to source distance + 5 if it is a relaying node, or 20 if it is a leaf node. Every time the packet is relayed, the TTL is decreased by one by the relaying node. If the TTL reaches zero, the packet is no longer relayed. Low values of TTL may indicate routing issues.
Min Temp	Minimum Temperature is the minimum temperature observed during the past hour. Temperatures are measured every 16 seconds and reported once an hour.
Max Temp	Maximum Temperature is the maximum temperature observed during the past hour. Temperatures are measured every 16 seconds and reported once an hour.
Max Accel (g)	Maximum Acceleration is the maximum acceleration observed during the past hour. It is measured in units of standard gravity <i>g</i> . Acceleration is measured 12 times every second and reported once an hour. The sensor observes acceleration along all 3 axes. The readings should range between 0 and 16 <i>g</i> in steps of 0.25 <i>g</i> .
Battery Volts	Battery is the maximum battery voltage observed during the past hour. The battery voltage is measured every 16 seconds and reported once an hour. With the standard lithium manganese primary battery, the voltage starts at 3.0V and decreases slowly to 2.5V as the battery is consumed.

9.3 V-Tag Sensor Statistics

V-Tag Sensor Statistics data is daily sensor statistics from all tags. The statistics provide information on the inner workings of the V-TAG and are intended for maintenance and diagnostics.

V-Tag ID	The ID of the V-TAG active RFID tag that is being addressed.
Timestamp	The date and time that the sensor report came in on.
Source Distance Hops	Source Distance is the number of hops to the nearest gateway for this V-TAG active RFID tag. It is based on communications with tag neighbors. For example, if the tag hears reports from a set of neighbors, and the neighbor with the lowest source distance reports a distance of 4 to the nearest gateway, this tag will then report a distance of 5. If there are many tags in an area, a tag may decide to become a leaf node and not do any relaying functions. In this case, it reports a source distance of 255, which should be shown in GUI displays as "Leaf".
TTL (Time to Live)	When a tag sends a sensor report to the gateway, it initializes the TTL (Time to Live) to source distance + 5 if it is a relaying node, or 20 if it is a leaf node. Every time the packet is relayed, the TTL is decreased by one by the relaying node. If the TTL reaches zero, the packet is no longer relayed. Low values of TTL may indicate routing issues.
Num Active Neighbors	Active Neighbors is the number of neighbors that the tag has synchronized successfully with in the last 30 second synchronization period. It has a maximum value of 12.
Total Errors	Total Errors is the number of internal software exceptions that the tag has observed since being powered up. It should normally be zero.
Last Error	Last Error is the error code of the last internal software exception that the tag has observed since being powered up. Possible error codes are 1=SPI Interface error, 2=Radio buffer reset failed, 3=Radio TX underflow, 4=Client tracking error, 5=Memory corruption, 6=Radio layer management error, 7=I2C communication error, 8=Watchdog triggered, 9=Task management, 10=Task duplication, 11=Recent low voltage reset.
Best Neighbor	Best Neighbor is the V-TAG tag ID of the neighboring tag with the strongest radio signal.
Best Neighbor RSSI Dbm	Best Neighbor RSSI is the received radio signal strength of the neighboring tag with the strongest radio signal. Values

normally range from 0 (strong signal) to -100 (weak signal).

Min Queue	The V-TAG tag has an internal queue of packets waiting to be relayed. Minimum queue measures the minimum length of this queue over a twenty four hour period. The statistic is reset after being reported.
Max Queue	The V-TAG tag has an internal queue of packets waiting to be relayed. Maximum queue measures the maximum length of this queue over a twenty four hour period. The statistic is reset after being reported.
Avg Queue	The V-TAG tag has an internal queue of packets waiting to be relayed. Average queue measures the average length of this queue over a twenty four hour period. The statistic is reset after being reported.
Processing Packets	Processed packets counts the number of packets processed by this tag over a twenty four hour period. A packet is considered processed if (i) if it queued for retransmission but the same packet is seen more than 5 times being transmitted from other tags and therefore discarded by this tag or (ii) if it is queued for retransmission and transmitted. The statistic is reset after being reported.
Alarm Count	Alarm count is the count of sensor threshold alarms reported over a twenty four hour period. The statistic is reset after being reported.
Firmware Version	Firmware version is the V-TAG tag firmware version.

9.4 V-Tag Command Center

V-Tag Command Center provides the functionality to manage all aspects of the V-Tag network. One of its primary features is the ability to upload a customized map of an area which can display the location of each V-Tag Asset. Please refer to the V-Tag Command Center Getting Started Guide for more information.

Chapter 10 Scheduled Maintenance

Scheduled Maintenance will utilize the Asset Maintenance records to show about upcoming maintenance required for assets. Maintenance can then be entered and logged for future reference.

Maintenance

Type to Search

Q

After Date

Before Date

✓	Name	Scheduled
✓	1101	2017-08-04

Asset Name

1101

Description

Current Location

Garage

Scheduled

2017-08-04

Maintenance Histories

Performed By

Action

Notes

Save

Figure 9-1 Scheduled Maintenance

Chapter 11 Import

11.1 Importing Records

Asset and location records can be imported from CSV files by clicking on the "Import" button in the Custom Actions drop down. CSV is Comma Separated Values, a simple text file format suitable for viewing with Microsoft Excel®.

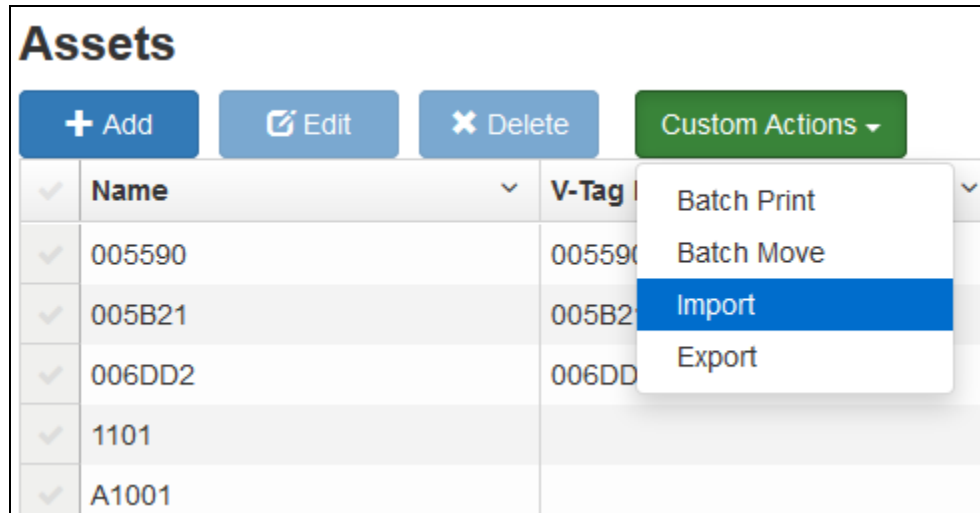


Figure 10-1 Importing Records

The import wizard will be started. The Import Wizard has five sections:

- Choose CSV
- Map Fields
- Fix Errors
- Confirm Import
- Import Summary

Certain fields are required and optional for Importing Assets and Importing Locations.

Choose CSV

Asset CSV Import - Upload File

To start, please choose a CSV file that you wish to import.
The CSV file should be formatted with headers to identify the rows during import.

No file selected.

Figure 10-2 Choose CSV File

Select the CSV file containing the records to be imported. It is assumed that the first line contains header information. Press "Next" to continue.

Map Fields

Asset CSV Import - Map Fields

Please match the CSV columns with the Asset properties

Required: 2

Name

Name

Location Name

LocationName

Optional: 36

RFID Tag

RfidTag

VTag ID

ActiveTagID

Description

Description

Asset Type

PreviousNext

Figure 10-3 Map Fields

Configure the mapping between field names in the file and field names in AssetWorx and then press Next.

Fix Errors

Asset CSV Import - Fix Errors

1 errors were found with the import. Please correct before proceeding.

SkipSkip All

FirstPrevious1NextLast

Asset Name must be set

Name

Location Name

RFID Tag

VTag ID

Previous

Next

Figure 10-4 Fix Errors

AssetWorx will now try to validate all of the records to ensure that the data has the correct syntax. If errors are found, you are given an opportunity to fix them. If you do not want to import this record, press the "Skip" button. If you do want to import this record, try fixing the error.

Confirm Import

Asset CSV Import - Confirm

Please review the import data before proceeding.

First Previous 1 2 3 4 5 6 Next Last

Name

Location Name

RFID Tag

VTag ID

^

v

Previous Next

Figure 10-5 Confirm Import

If there are no errors remaining, you see the "Confirm Import" screen. Here you can review the data that will be imported.

Import Summary

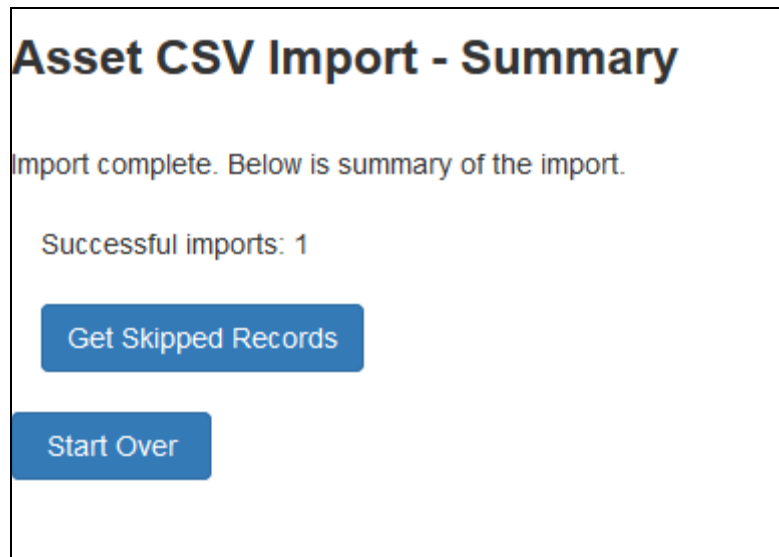


Figure 10-6 Import Summary

The "Import Summary" is displayed. Press "Done" to close the window.

11.2 Importing Assets

The CSV file must have a certain format for its data fields. If a data field contains commas, you need to surround that field with double quotes. If a data field contains double quotes, you need to replace the double quote with two double quotes and surround that field with double quotes. Data fields are not allowed to contain newlines.

The following fields are required for importing asset records:

- Asset Name (must be unique and not already exist in AssetWorx)
- Location (if the location does not already exist in AssetWorx, it will be created during import)

The following fields are optional for importing asset records:

- Description (255 characters maximum)
- RFID Tag
- V-Tag ID
- Description
- Department Name
- Check In Status
- Checked Out To
- Additional

- Custom Text Fields

Date Formats

The expected date format is the format specified in the Windows Regional and Language Options Control Panel. If no time is specified, the time is taken to be 12 midnight.

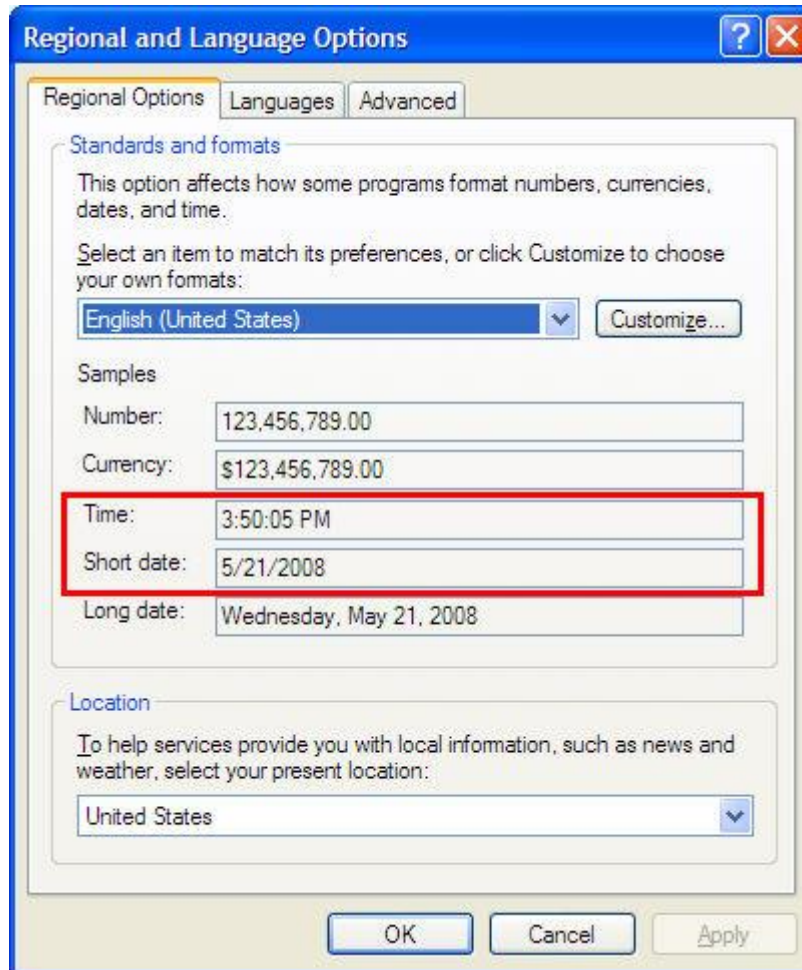


Figure 10-7 Regional and Language Options Control Panel

11.3 Importing Locations

The CSV file must have a certain format for its data fields. If a data field contains commas, you need to surround that field with double quotes. If a data field contains double quotes, you need to replace the double quote with two double quotes and surround that field with double quotes. Data fields are not allowed to contain newlines.

The following fields are required for importing location records:

- Name

The following fields are optional for importing location records:

- Site
- Building
- Floor
- Room
- Description (255 characters maximum)
- RFID Tag (must be 24 hex characters if present)

AssetWorx will not stop you from importing locations with names that duplicate existing records. To delete the duplicates, order the list of locations according to "Created" field by clicking on the header and manually delete any unwanted duplicates.

	Created ▾	Created By	Last Modified
	2014/07/29 11:42	Admin	2014/07/29
	2014/07/29 11:42	Admin	2014/07/29
	2014/07/29 11:41	Admin	2014/07/29
	2014/07/29 11:41	Admin	2014/07/29
	2014/07/29 11:41	Admin	2014/07/29
	2014/07/29 11:42	Admin	2014/07/29

Figure 10-8 Deleting Duplicate Location Records

Chapter 12 Options and Reports

12.1 Options

Options allow to modify certain application wide configurations within the AssetWorx web user interface.

Format Options – Specify the Company Prefix which will affect how RFID are formatted in printing. Starting Serial is the next serial number that an RFID print will use. Format Type allows the user to choose either Fahrenheit or Celsius.

Auto Trim Options - The Event and Sensor Data read into the AssetWorx system can be very large. To manage the size of this data, set the number of days that you want to keep your data for the various data types below. To exempt a data type from the trim service, choose the number zero.

Asset Name Serialization – The Name field is required in AssetWorx. Some customers do not have a unique value they want to use for this field. For these options, AssetWorx can be configured to automatically serialize name values.

MQTT – AssetWorx provides integration with the MQTT which is a popular pub/sub protocol. Users can subscribe to system-wide MQTT event notifications. Users can also define MQTT print clients which can be utilized by the AssetWorx Enterprise Print Client application.

Email Settings – These settings will be used in the Email option of Alerting Actions. Choose between SMTP and Cloud Email. For Cloud Email, please contact your support@infinidtech.com to request a username/password.

System Settings – The primary purpose of System Settings is control authentication in AssetWorx. AssetWorx uses OpenID Connect as its authentication protocol. Therefore, any client that will want to access the resource server will need a Client entry specified. All of the clients that belong to the AssetWorx software suite already have an entry in this list along with a unique Client Secret.

VTag GPS Settings – All VTag GPS gateways will automatically forward their messages to a specific server for processing. Enter the server username/password supplied to you to enable the AssetWorx Web Server to receive a stream of messages which allow your assets to stay updated with the latest GPS coordinates.

Company Settings – AssetWorx also supports a tenant based data isolation model for enterprise customers. Each company entry in this section will have their user and asset records which no other company can see.

12.2 Reports

AssetWorx provides a variety of reports out of the box. Reports such as Assets List, Locations List, Asset Location History can be found in the Reports menu. AssetWorx writes all reports to an Excel compatible file.

Chapter 13 Common Problems

How am I supposed to know what the AssetWorx address is?

The final Install Summary screen of the installer will mention what the AssetWorx website address is. This can be copied and sent to interested users. In addition, the installer will also place an HTML shortcut on the desktop of the machine where the AssetWorx web server is installed.

When I try to connect to AssetWorx with my web browser, it tells me there is a problem with the website's security certificate

When you see this option, it is because the person who installed the AssetWorx web server chose to encrypt web traffic. This is accomplished using SSL certificates. AssetWorx by default allows a user to generate a personal certificate for the web server which references an InfinID Technologies Trusted Root Certificate. The reason you are seeing the warning from your browser is because although the web server has the InfinID Technologies Trusted Root Certificate, your computer doesn't have it in its own root certificate store. There are several options for when you see these warning messages:

1. Accept the warning message by clicking "Continue to this website" which will take you to the website. The downside of this approach is that you will have to choose this option every time you load the website.
2. Sign up with an established certificate authority like VeriSign. This will make it so that everybody who visits the web server will have the Root Certificate in their certificate store.
3. Install the InfinID Technologies in the Trusted Root Certificate store for every computer that will access the AssetWorx website.
4. Use unencrypted connections for the web application. If you only plan on exposing your web traffic over the local area network, it may be unnecessary to encrypt your traffic.

I have installed RFID portals, but no reads are showing up in the Event screen.

When an RFID portal reads an RFID tag for an asset, it should show up in the Event screen. Here are some things to check:

1. Go to the Network Management screen. If it says No Alarm Monitoring Service is Running, make sure the Alarm Monitoring Service is installed and running.
2. Go to the Network Management screen and make sure that the lines connecting to your reader show up in green. If they show up in red, it means that the Alarm Monitoring Service is unable to connect to the reader. See Chapter 7.4 Network Management for more information.
3. Make sure that the RFID tag is entered in one of your Asset records. When the Alarm Monitoring Service reads an RFID tag, it will look up to see which asset matches the RFID value. If no asset is found, it will disregard the read.

When I open up my browser, the AssetWorx web application doesn't show up properly

If you are using Internet Explorer and the web server is installed on the local network, Internet Explorer may show the site in Compatibility Mode. Compatibility Mode makes

Internet Explorer treat local network websites as an older version of HTML, making the newer JavaScript and CSS libraries non-functional. To correct this, in Internet Explorer, click on Tools, Compatability View Settings, then uncheck the “Display intranet sites in Compatibility View” checkbox. Another option is switching to a more modern browser such as Chrome, Firefox or Microsoft Edge.

AssetWorx website returns handler error

After I install the Web Server, when I open the web application in my browser, I get this error:

“Handler "ExtensionlessUrlHandler-Integrated-4.0" has a bad module
"ManagedPipelineHandler" in its module list”

This error means that our installer was not able to successfully register asp.net with the computer when it installed IIS. To correct this error, follow these instructions:

1. Click the Windows Button, type “cmd”. When the cmd executable shows up, right click it and press “Run as administrator”
2. In the cmd window, type
“C:\Windows\Microsoft.NET\Framework\v4.0.30319\aspnet_regiis.exe -I” and hit enter.
Please note that the exact path may vary slightly.