

April 27, 2018



## Perfect Pick HD User Manual

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Original Language Instructions



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# 1 Safety

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## About this manual

The information provided in this chapter is intended to educate you on various safety issues regarding the operation and maintenance of the OPEX equipment described in this manual.

This chapter provides an explanation of the safety conventions used throughout this manual, as well as safety guidelines to be observed when working with this equipment.



**WARNING:** Read this chapter thoroughly before working with this equipment.

## Safety conventions used in this manual

OPEX documents use the following conventions to describe certain procedures and situations. Please be aware of these conventions when reading the manuals and operating the machine:



**DANGER:** Indicates a hazardous situation that, if not avoided, will result in death or severe injury. The use of this signal word is limited to the most extreme situations.



**WARNING:** Indicates a hazardous situation that, if not avoided, could result in death or serious injury.



**CAUTION:** Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.

**NOTICE:** Indicates information considered important, but not hazard related.

## Safety Guidelines

This section provides safety guidelines to be observed when working with this equipment.

The Perfect Pick HD® adheres to the NFPA 79 electrical standard for industrial machinery, which provides safeguards to protect operators, equipment, facilities, and work-in-progress from fire and electrical hazards.



**CAUTION:** Follow these safety guidelines whenever installing, operating, servicing, or maintaining the equipment described in this manual.

**Charging rail** - Hands should be kept clear of the charging rails when the doors are closed. Shorting of the charging rails with either a watch or ring may result in electrical shock.

**Rail de chargement** - Les mains doivent être éloignées des rails de chargement lorsque les portes sont fermées. Le court-circuit des rails de charge avec une montre ou un anneau peut provoquer un choc électrique.

**Do not remove the plastic, protective covers from the bottom of the iBOTs** - The covers protect the iBOT's ultracapacitors and circuitry from damage. The covers also protect the operator from harm if the ultracapacitors should leak. For information on ultracapacitor safety, refer to ["Ultra-capacitor Product Information" on page 16](#).

**Ne retirez pas le plastique, les capots de protection du bas des iBOTs** - Les couvertures protègent les ultracapacités et les circuits des iBOT contre les dommages. Les couvertures protègent également l'opérateur des dommages si les ultracapacités doivent se faufiler. Pour plus d'informations sur la sécurité des ultracapaciteurs, reportez-vous à la section «["Ultra-capacitor Product Information"](#)» à la [page 16](#).

**Keep loose objects away from any exposed, moving parts of the machine** - The moving parts of the Perfect Pick HD, such as the conveyor, can become jammed and/or damaged by foreign objects. Keep hands, hair, loose clothing and jewelry away from the moving parts.

**Gardez les objets lâches à l'écart des parties exposées et mobiles de la machine** - Les parties mobiles du Perfect Pick HD, telles que le convoyeur, peuvent être bloquées et / ou endommagées par des objets étrangers. Gardez les mains, les cheveux, les vêtements lâches et les bijoux loin des pièces mobiles.

**Do not attempt to clean the machine while it is running** - A cloth (or similar material) should never be used to clean moving parts such as belts or rollers. The use of such material on moving mechanisms can result in damage to the machine or severe personal injury. If a belt, roller, gate or similar part needs to be cleaned, hand-crank the part during cleaning or clean it while stationary.

**N'essayez pas de nettoyer la machine pendant son fonctionnement** - Un chiffon (ou un matériau similaire) ne doit jamais être utilisé pour nettoyer les pièces mobiles telles que les courroies ou les rouleaux. L'utilisation d'un tel matériau sur les mécanismes de déplacement peut endommager la machine ou subir des blessures graves. Si une ceinture, un rouleau, une grille ou une pièce similaire doivent être nettoyés, faire maniveller la pièce pendant le nettoyage ou la nettoyer en stationnaire.

**Do not use flammable, high pressure, "canned air" to clean dust and debris from the machine.**

**N'utilisez pas d'air comprimé inflammable, à haute pression pour nettoyer la poussière et les débris de la machine.**

**Familiarize yourself with the location(s) of machine Emergency Stop switches** - The E-Stop switches enable a quick stop of all motors in the machine, in the event of an emergency involving potential personnel injury.

**Familiarisez-vous avec le (s) emplacement (s) de la machine Interrupteurs d'arrêt d'urgence** - Les interrupteurs E-Stop permettent d'arrêter rapidement tous les moteurs de la machine en cas d'urgence impliquant des blessures potentielles.

**Keep away from children** - This equipment is not suitable for use in locations where children are likely to be present.

**Tenir à l'écart des enfants** - Cet équipement ne convient pas aux endroits où les enfants sont susceptibles d'être présents.

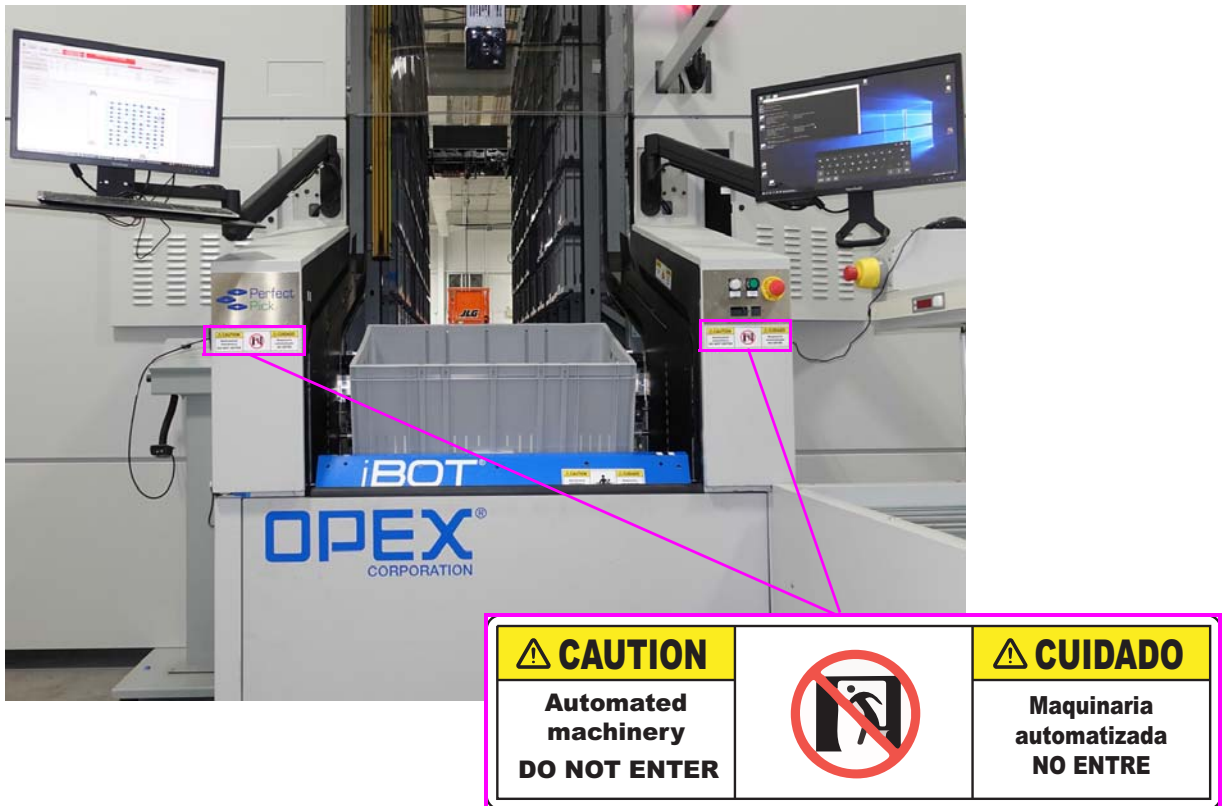


## Safety labels



**CAUTION:** Follow the safety precautions on all labels to avoid injury when operating the Perfect Pick HD. Failure to follow these precautions may result in severe personal injury or damage to the machine.

**Machine Entry** Only approved OPEX technicians and qualified personnel can enter the machine. The “Automated machinery DO NOT ENTER” label shown in Figure 1 is found on both sides of the pick station(s).



**Figure 1: Machine Entry label**

**Main Power Enclosure** Only approved OPEX technicians and qualified personnel are authorized to access the main power enclosure (Figure 2) for troubleshooting and/or servicing the machine.



The “WARNING Arc Flash and Shock Hazard” label is found on the front of the Main Power Enclosure

**Figure 2: Main Power Enclosure - Warning label**

**Climbing the structure** Do not climb on any part of the Perfect Pick HD (see Figure 3).



The “DO NOT CLIMB STRUCTURE” label is found on the exposed ends of every other ladder, above where the exterior cover ends. If the machine has no rear pick station, another set of these labels goes on the back of the rear ladders.



**Figure 3: Do Not Climb Structure**

**Scissor Lift and Fork Lift Operation** Use of a scissor lift (Figure 4) or forklift requires appropriate certification. Do not operate or ride in either of these machines unless you have taken the corresponding training course. Only approved OPEX technicians and qualified personnel are authorized to use the scissor lifts and iBOT recovery tools.



**Figure 4: Scissor Lift**

**Keep Hands Away** Keep hands and loose objects away from any exposed, moving parts of the machine (see label in Figure 5). The moving parts of the Perfect Pick HD can become jammed and/or damaged by foreign objects. Also, keep hair, loose clothing or jewelry away from the moving parts.



Pick station - left side

Pick station - right side



The “KEEP HANDS AWAY” label can be found on both sides of each pick station, on the metal plate above the diagonal track.

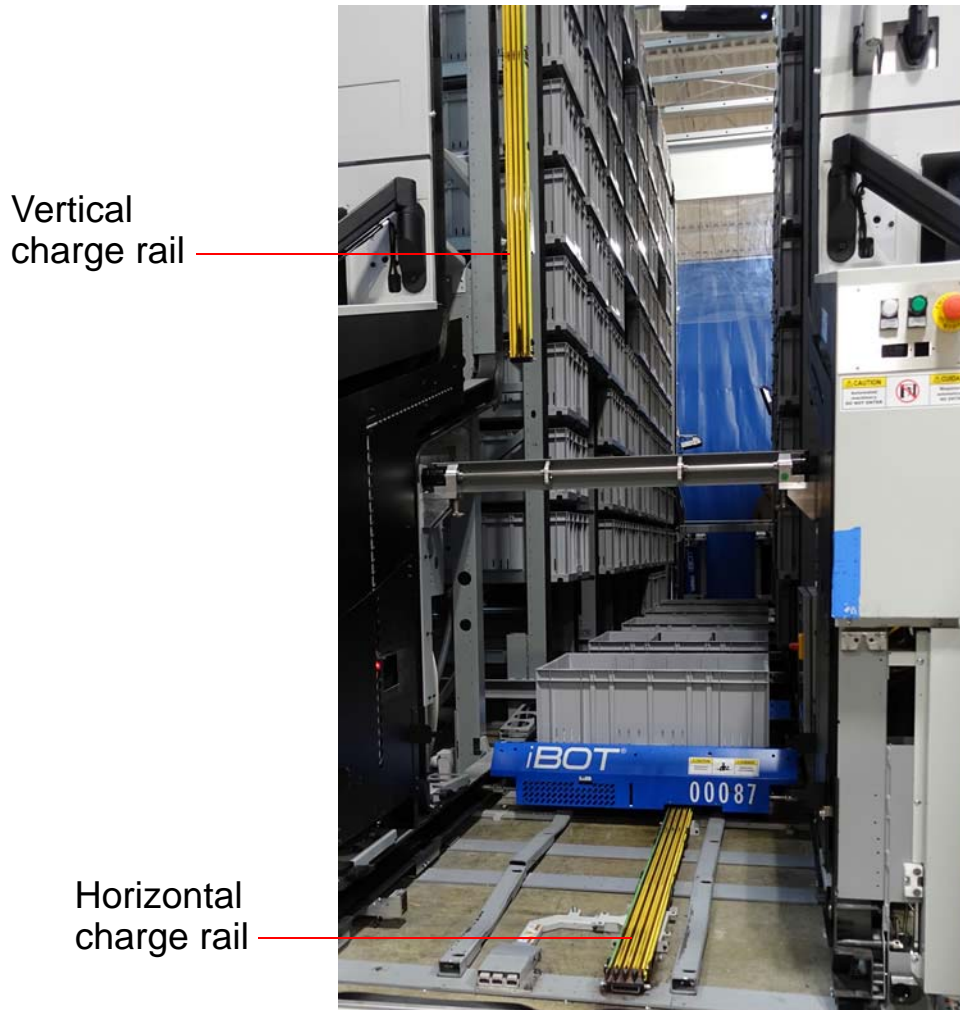


**Figure 5: Keep Hands Away Caution label**



**Charging rail** Hands should be kept clear of the charging rails (Figure 6) at all times. Shorting of the charging rails with either a watch or ring may result in electrical shock.

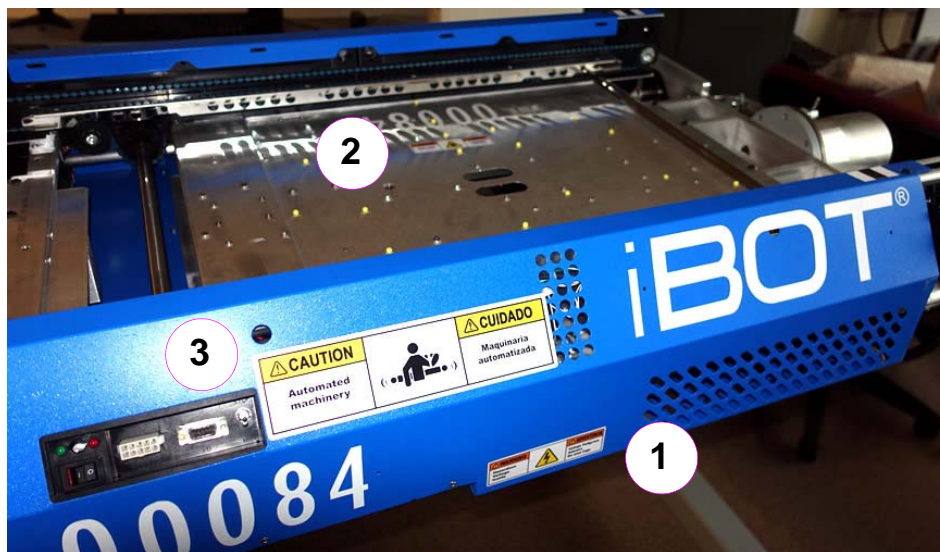
**TIP:** One of the easiest ways to determine the front of the machine is to note the location of the vertical charge rail. The vertical charge rail will always be in the front of the machine.



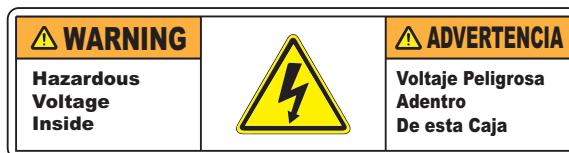
**Figure 6: Charging Rails**

**iBOT safety** The iBOT (Figure 7) was designed to carry loads of up to 80 pounds. In order to function properly, the iBOT incorporates automated

machinery along with potentially hazardous voltages. Therefore, it should be treated with care. Take note of the labels shown in Figure 7.



1. The “Hazardous Voltage Inside” label is found on the cover beneath the “Automated machinery” label on the control panel side.
2. There are two of the “KEEP AWAY moving parts” labels on the iBOT, on the top metal surface (the second label is hidden in the photo).
3. The “Automated machinery” label is on the iBOT’s cover. One on each side, on the slanted surface.



**Figure 7: iBOT safety labels**

## Other Cautions



**CAUTION:** The ultra-capacitors that power the iBOTs contain acetonitrile. In the event that an ultra-capacitor should leak, avoid contact with or breathing the acetonitrile. For information on ultra-capacitor safety, refer to [“Ultra-capacitor Product Information” on page 16](#).

# Ultra-capacitor Product Information



## Product Information Sheet

An MSDS is not required. This information sheet is provided as a service to our customers. An MSDS for the active chemical inside the listed products is available upon request. **For US Customers:** The products referenced herein are exempt articles and are not subject to the OSHA Hazard Communications Standard Requirement 29 CFR 1910.1200. **For EU Customers:** The products referenced herein are not submitted to 91-155 EEC, as they are considered as components and not as a chemical substance. **Notice:** The information and recommendations herein contained are made in good faith and are believed to be accurate at the date of preparation. Maxwell Technologies Inc. makes no warranty expressed or implied.

### Product Information

<b>Manufacturer</b> Maxwell Technologies Inc. 9244 Balboa Avenue San Diego, CA 92123 Phone: 858-503-3300 Fax: 858-503-3333	<b>Product:</b> Ultracapacitors
<b>EMERGENCY PHONE:</b> North America Chemtrec Hazmat Communication Center 1 800 424 9300 + 1 703 527 3887 Europe Swiss Toxicological Information Centre +41 (0)44 251 5151	<b>Models:</b> All configurations and versions of PC5, PC10, PC5-5, BCAP0005 and BCAP0010
	<b>Date:</b> June 19, 2009
	<b>Asia</b> Chemtrec Hazmat Communication Center 1 800 424 9300 + 1 703 527 3887

### Product Components

**Important Safety Note:** Ultracapacitors should not be opened, disassembled, crushed, burned, or exposed to high temperatures (>85°C, 185°F), and should be operated only within their defined operating specifications. Failure to adhere to operating specifications could result in poor device performance or unsafe operating conditions. Exposure to the components contained within the ultracapacitor could be harmful under certain circumstances. In case of exposure to ultracapacitor contents, wash affected area for at least 15 minutes with generous amounts of water and seek medical attention. Fires involving these types of ultracapacitors should be extinguished with CO2, dry chemical, alcohol foam, or all purpose AFFF extinguishing media. Water may be ineffective but should be used to cool fire-exposed containers, structures and to protect personnel.

BOOSTCAP® ultracapacitors are composed of the following major components:

Electrodes:	Activated Carbon
Separator:	Polypropylene or Cellulose
Electrolyte:	Quaternary salt (tetraethylammonium tetrafluoroborate)
	Organic solvent (acetonitrile)
Other:	Aluminum, steel

### Disposal

BOOSTCAP ultracapacitors are neither specifically listed nor exempted from government hazardous waste regulations. The only material of possible concern is the organic solvent, which when discarded or disposed of, is a hazardous waste according to Federal regulations (40 CFR 261). It is listed as Hazardous Waste Number U003, so listed due to its toxicity and ignitability. Disposal can occur only in properly permitted facilities. Check state and local regulations for any additional requirements, as these may be more restrictive than federal laws and regulations.

### Transportation

Ultracapacitors as articles are not specifically listed nor exempted from hazardous materials regulations (HMR). The U.S. Department of Transportation has provided Maxwell Technologies a written determination regarding Maxwell's PC5 and PC10 BOOSTCAP ultracapacitor products that the materials comprising the ultracapacitors are "...in a quantity and form that does not pose a hazard in transportation. Therefore, the ultracapacitors are not subject to the HMR."

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<b>info@maxwell.com – www.maxwell.com</b>			

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## Emergency Stop (E-Stop) buttons

For operator safety, Perfect Pick HD incorporates big, red, mushroom-shaped Emergency-Stop buttons (E-stops) to stop the machine in the event of an emergency. E-Stops are located at all pick stations and on the front of the main power enclosure. Pushing any of these E-stops cuts power to the charging rails, tilts and wireless transceivers.



**WARNING:** Emergency stop switches do not remove power from all electrical devices within the Perfect Pick HD. Power to main enclosure components, UPS, computers and other devices remains energized after the E-Stop switch is pushed.

### Pick station E-stops

An E-stop button is located at each pick station (Figure 8). If necessary, push on the E-Stop to stop the machine immediately.

- To restart the machine, clear the machine (if needed), pull the E-Stop knob out, and press the green Start button.
- The Clear-to-Pick light is an additional safety feature. See [“Clear-to-Pick indicators” on page 21](#).

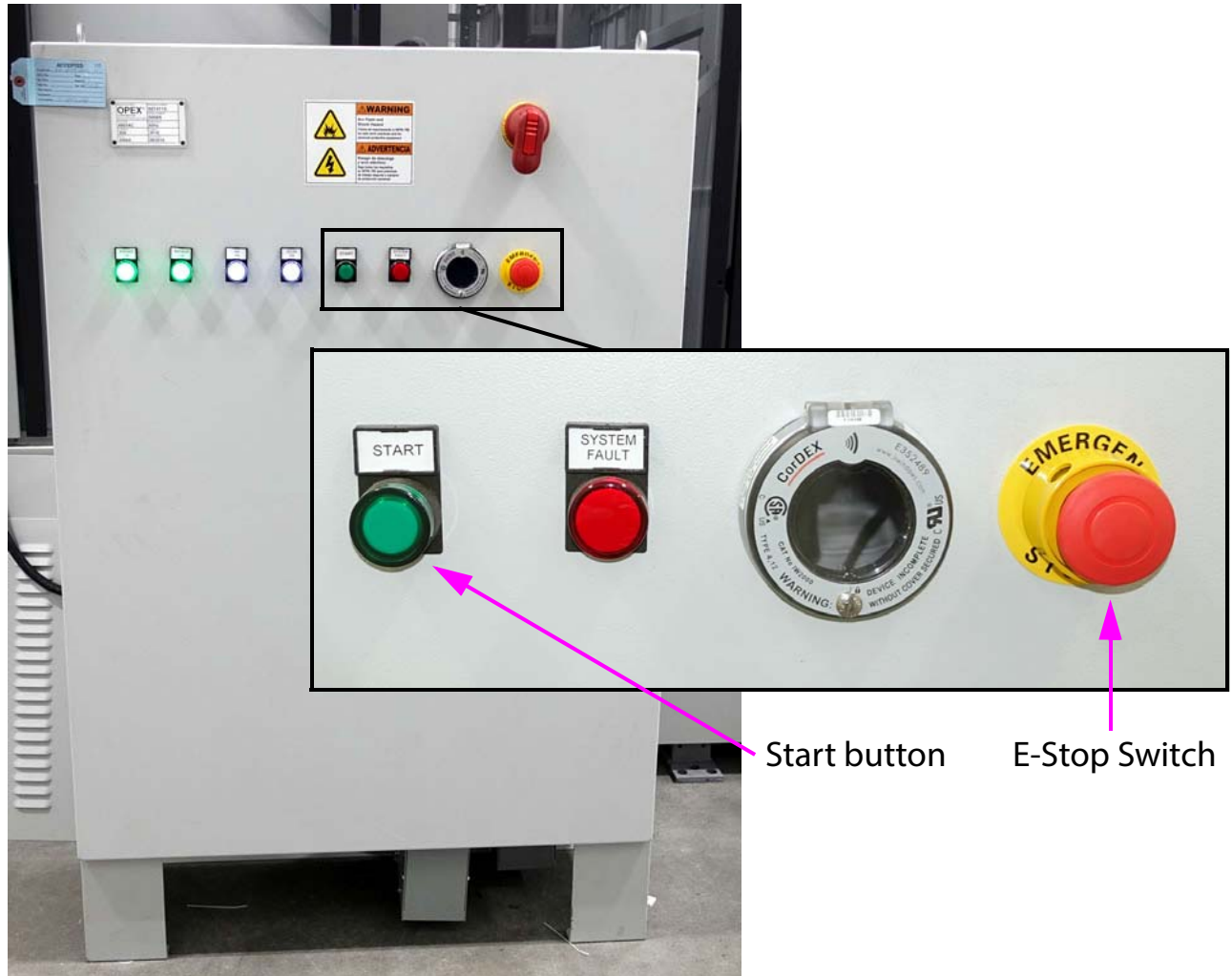


**Figure 8: Pick Station E-stop**

## Main power enclosure E-stop

An E-stop button is located on the front of the main power enclosure (Figure 8). If necessary, push on the E-Stop to stop the machine immediately.

- To restart the machine, clear the machine (if needed), pull the E-Stop knob out, and press the green Start button.



**Figure 9: Main power enclosure E-stop**

## Safety interlocks

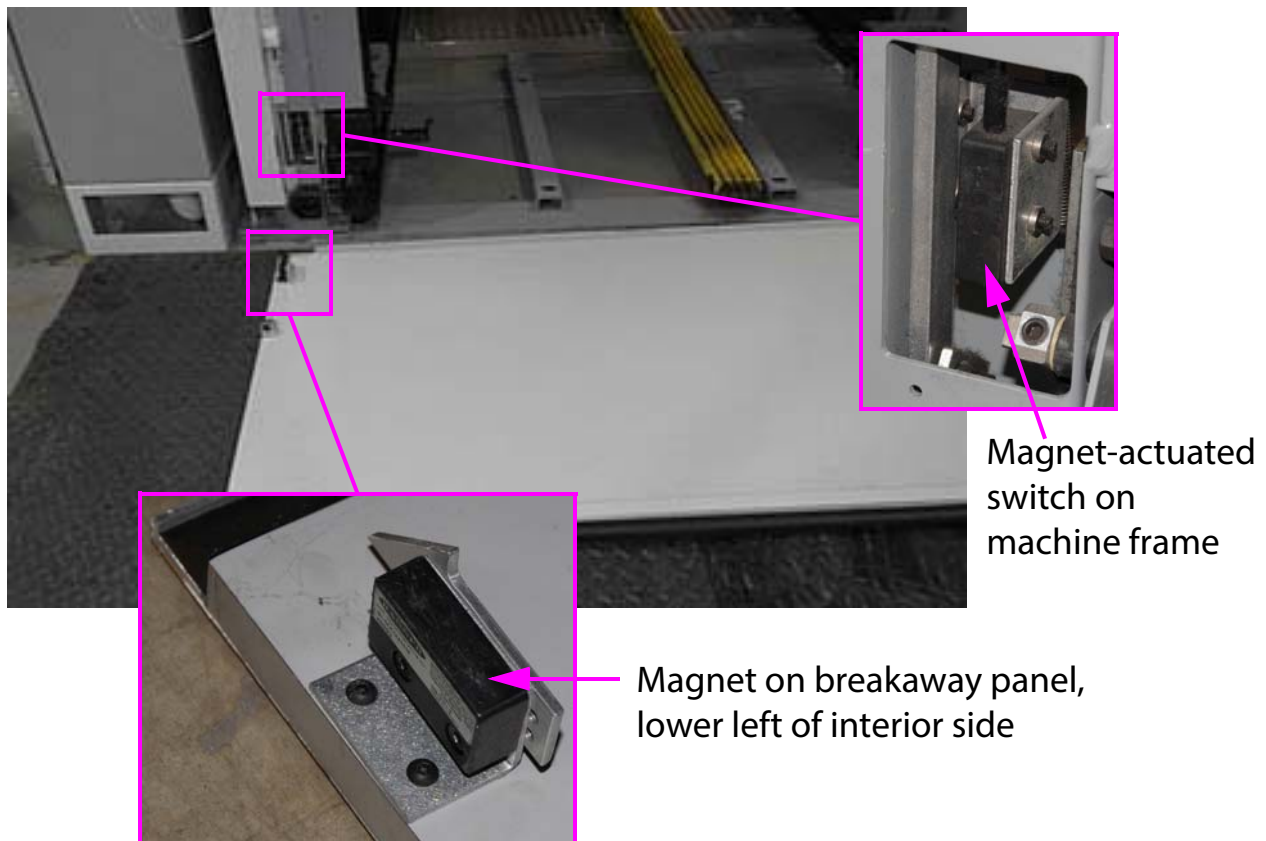
The safety interlocks include break-away panels with interlock switches and a light curtain at each pick station.

### Break-away panel interlocks



**WARNING:** Door interlock switches do not remove power from all electrical devices within the Perfect Pick HD. Power to main enclosure components, UPS, computers and other devices remains energized after the E-Stop switch is pushed.

Entering the machine while it is running can pose a safety hazard due to the rapidly-moving iBOTs. For your safety, interlocks have been installed on the front and rear break-away panels (Figure 10) of the Perfect Pick HD machine. The interlocks will stop the machine whenever a break-away panel is opened.



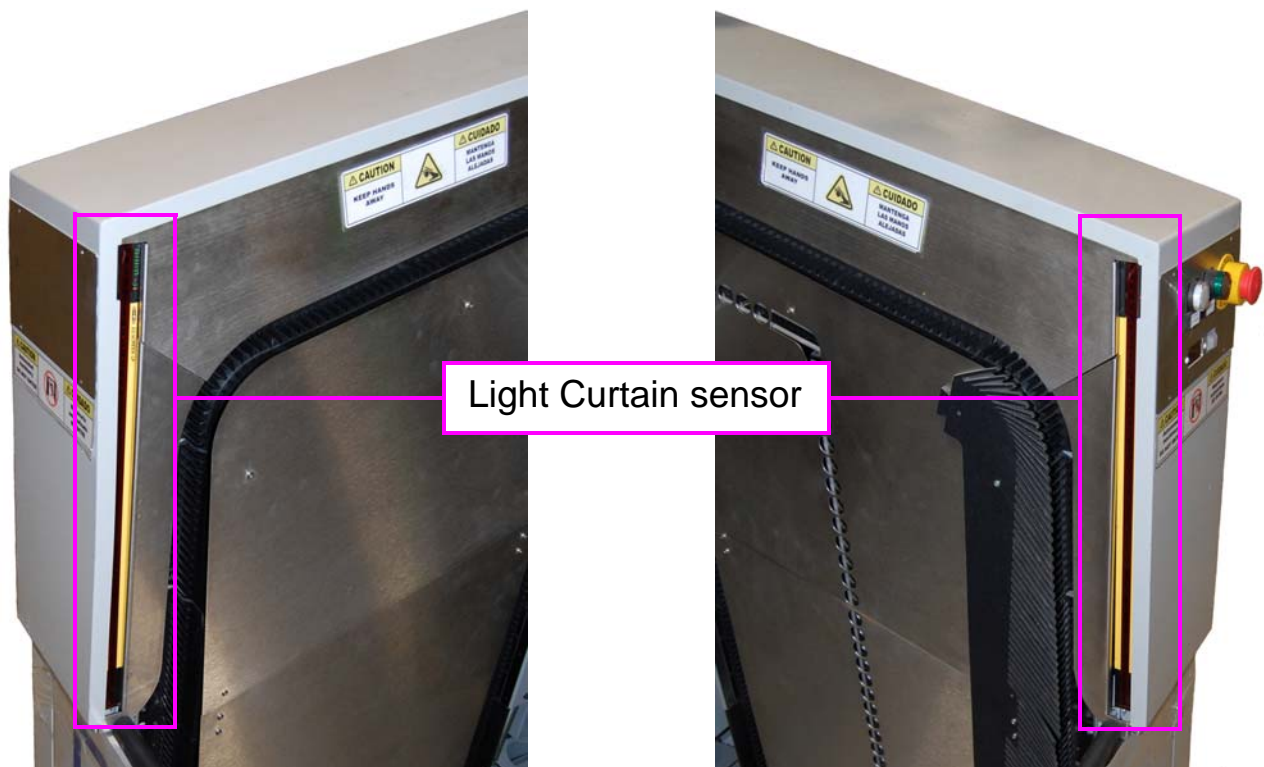
**Figure 10: Break-away Panel (removed from the machine)**

The intent of the break-away panel is to break the interlock circuit and stop the machine should an operator's hand or arm become wedged between the panel and a downward moving iBOT.

A magnetic sensor is located at the bottom left side of the panel and can be easily tripped by kicking the panel. When this panel is removed, all iBOT motion will stop.

## Light curtain

The light curtain is a sensor used to stop just the iBOTS in the pick station area, should you have your hands in the iBOT travel areas when the iBOTS are in motion (Figure 11).



**Figure 11: Light curtain sensor**

## Clear-to-Pick indicators

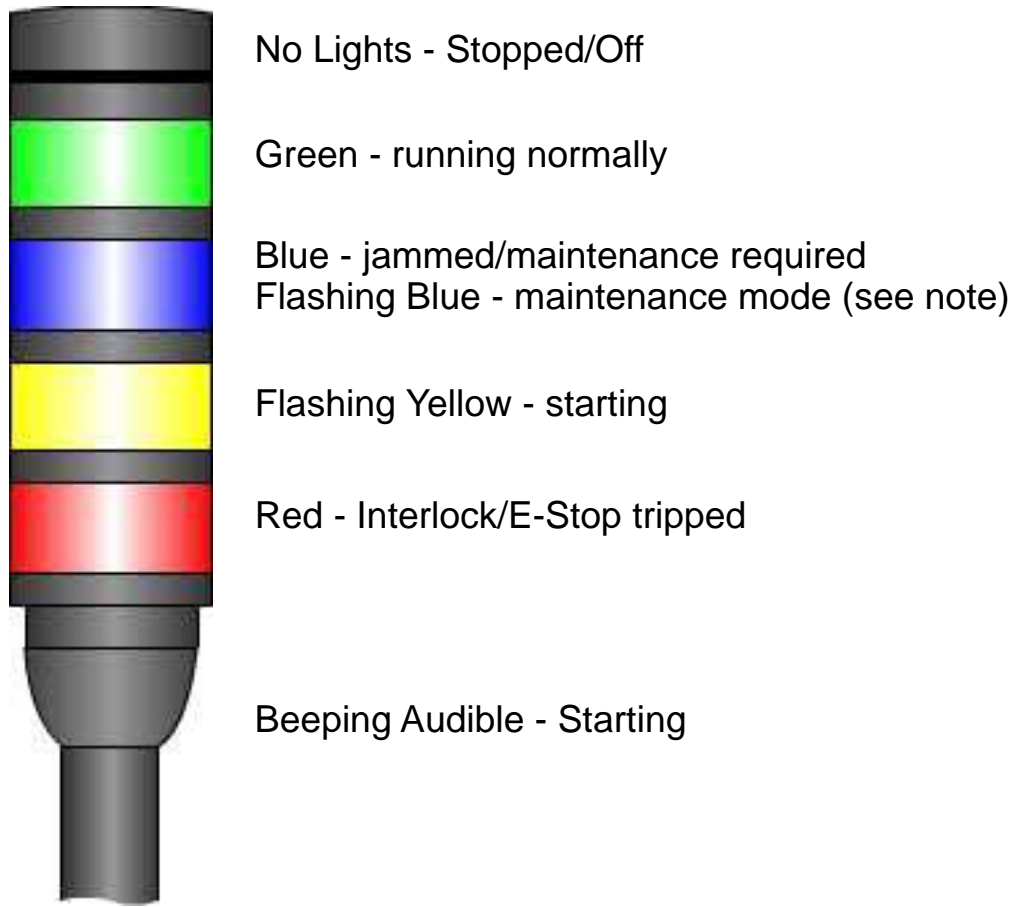
Each pick station incorporates a white Clear-to-Pick light as a safety feature. When illuminated, the light indicates when it is safe for the user to pick an item from the presented tote (Figure 12).



**Figure 12: Pick station Clear-to-Pick indicator light**

## Light Tower

A light tower is located at the front and rear pick stations of the aisle, and at the service access door if one is present. The colored bands on the light tower are used to show the status of the machine (see Figure 13).



**Figure 13: Light Tower**

**Note:** From Maintenance mode, the machine is restarted, which will bring the solid green light on in addition to the flashing blue light. Once the technician determines that the machine is operating properly, he/she will turn off the flashing blue light by exiting out of Maintenance mode, leaving only the solid green light.

## Ergonomics

As in any occupation that requires you to perform the same motion repeatedly during the course of your work, it is important to consider how you perform your task. Listed below are some guidelines to help you minimize the risk of physical discomfort and injury while operating the equipment.

**NOTICE:** Always observe the following guidelines when operating the Perfect Pick HD

### When at the pick station:

- Maintain an upright body posture.
- Occasionally change the angle of your posture for greater comfort.
- Avoid operating the machine for longer than a single 10-hour shift. If possible, stretch between breaks.





# 2 Introduction

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## Overview

Perfect Pick® HD is a high-density, high throughput, robotic goods-to-person order picking technology for warehouses and distribution centers. The Perfect Pick HD uses iBOTS, which are autonomous vehicles, to deliver payloads of up to 80 lbs. to the operator.

## Terminology

The following terms/concepts are used to describe the software and functionality of the Perfect Pick HD machine.

### Warehouse Management System (WMS)

The Warehouse Management System (WMS) application supports the day-to-day operations in a warehouse. The WMS enables the management of tasks such as tracking inventory quantities and item locations.

### Warehouse Control System

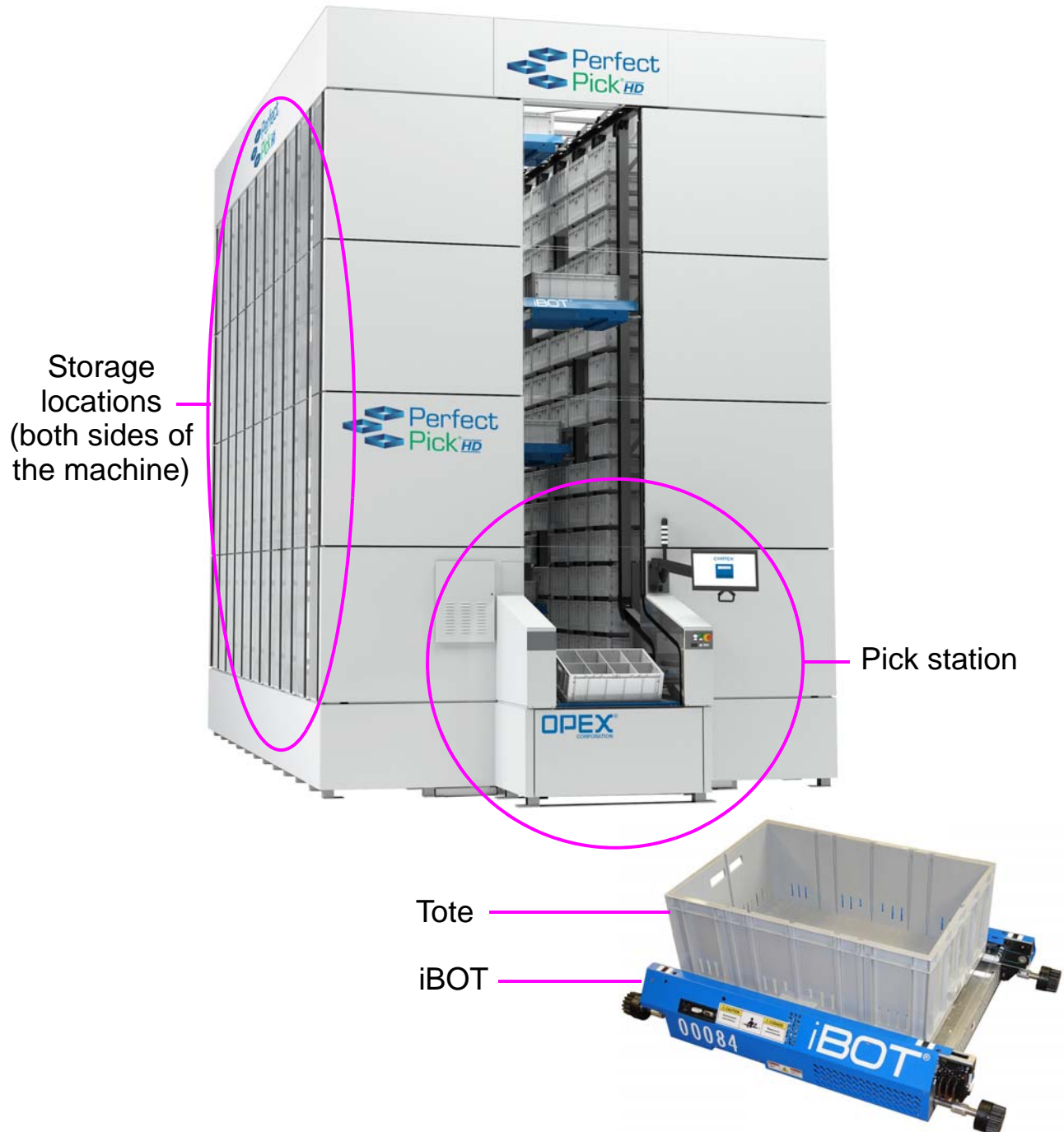
A software application that controls the real-time activities and tracks inventory movements.

### Inventory Control System (ICS)

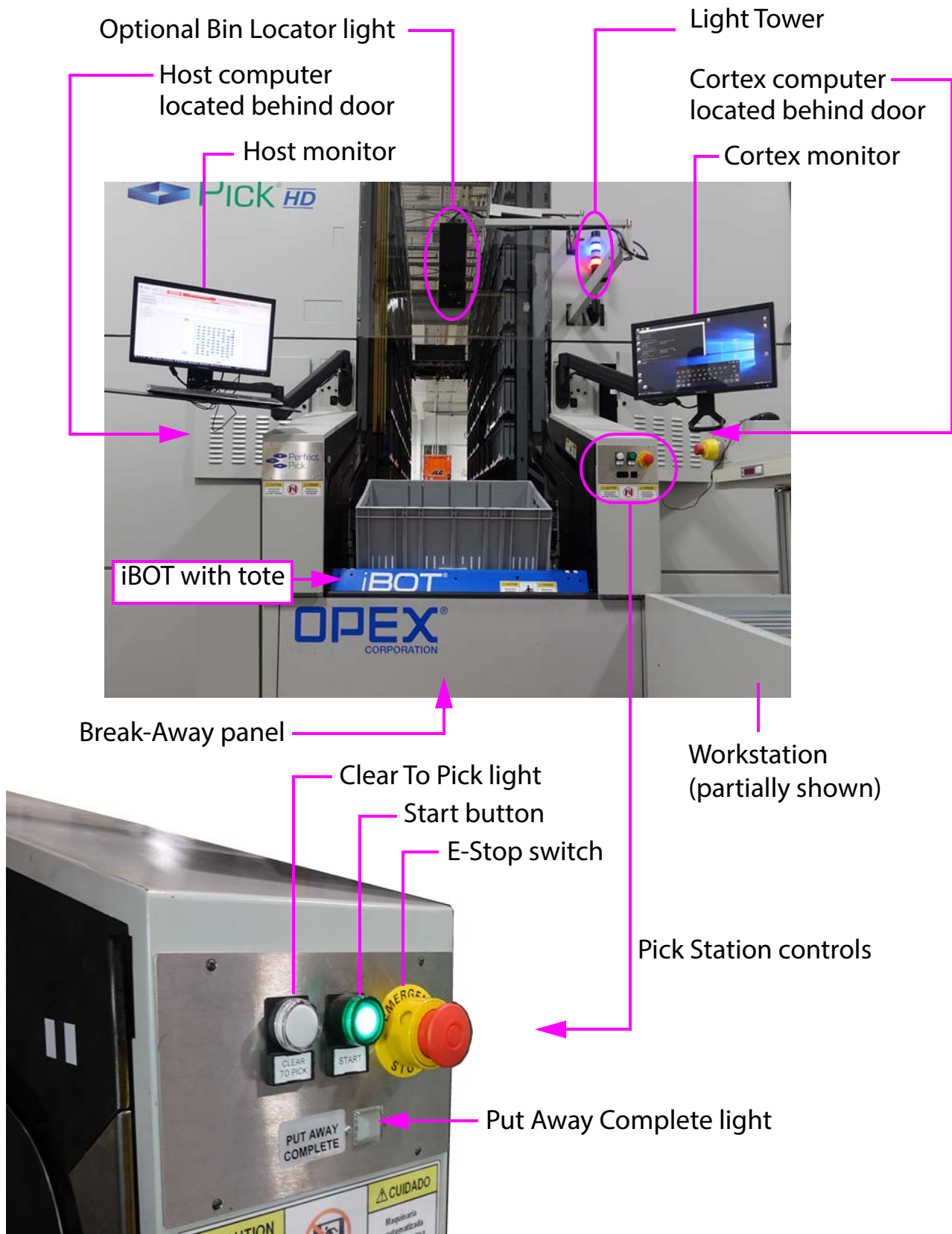
This term is used to describe the software, such as CORTEX, that provides *both* the Warehouse Management System and the Warehouse Control System.

# Main Components

Figure 14 identifies the main components of the Perfect Pick HD. Figure 15 shows details of the Pick Station.



**Figure 14: Perfect Pick HD main components**



**Figure 15: Pick Station detail**

The Perfect Pick HD system includes:

- **Storage columns** - Totes are stored two deep on both the left and right sides of the machine (the number of tote locations varies with height and load size). The Perfect Pick HD can be expanded over time by adding racking modules and/or additional iBOTS.
- **iBOTS** - Delivery cars used to pick up totes from the storage columns and deliver them to the operator. The number of iBOTS in your system is determined by the sales contract.
- **Pick station(s)** - The main area where an operator stands. iBOTS advance through the machine and move into the pick station, where they can tilt to make it easier for the operator to access. The operator can then easily remove the needed contents/product from the tote, or restock totes in replenish mode. There will always be a front pick station. A rear pick station is an available optional. Pick stations can be located on ground level or mezzanine level, based on the sales contract.
- **Computers** - The Perfect Pick HD comes with:
  - Cortex PC with Inventory Control System software and monitor
  - OPEX Host PC with OPEX host software and monitor
  - Over-height sensor PC, which does not have its own monitor. Data from this PC is shared with the Opex Host PC.
- **Main Power Enclosure** - The main power enclosure, shown in Figure 16, is a large, light gray box (36" wide x 48" tall) that sits roughly 8-10 inches off the ground. There will always be one main power enclosure per aisle.

Almost all of the components making up the electrical system can be found within the main power enclosure.



**Figure 16: Main Power Enclosure**

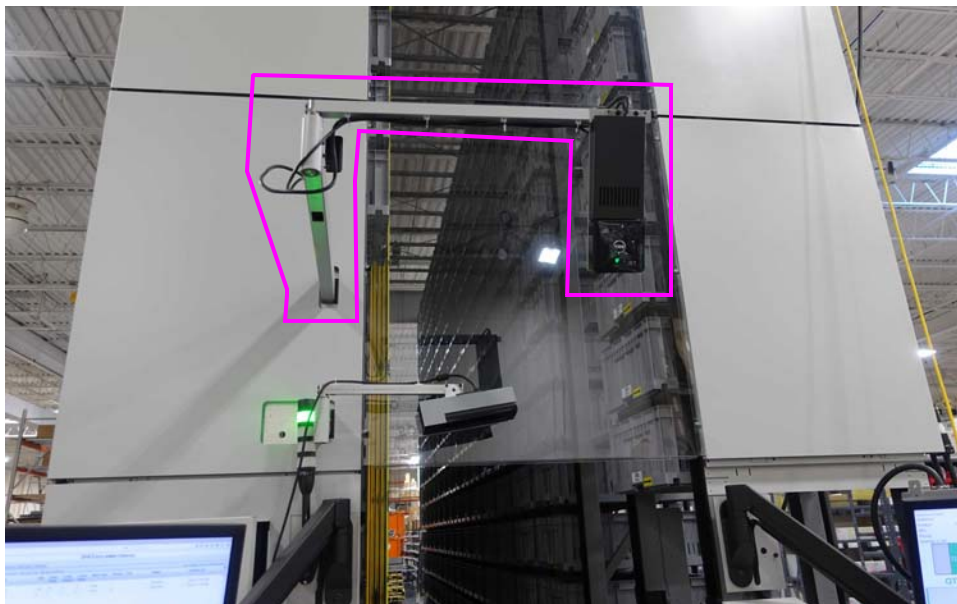
- **Over Height System** - consists of a 3D camera (Figure 17) and a dedicated PC. As an iBOT takes a tote away from the pick station, the over height system analyzes the tote to check for:
  - Overflowing contents, which could spill or collide with the Perfect Pick HD frame, iBOTs, or the storage columns.
  - Tote walls bulging from being overstuffed. This can cause totes to get stuck when placed in the outside column positions.

If a problem is found, the operator is notified so they can correct it.



**Figure 17: Over height 3D camera**

- **(Optional) Bin Locator Light** - this optional feature is used to identify the specific area within the tote where the operator is to pick the part, by shining a light in the section, or cell, of the tote.



**Figure 18: Optional Bin Locator Light**





# 3 Operation

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## Overview

This chapter describes how to run the machine. There are two modes of operation with the Perfect Pick HD:

- **Continuous Mode** - in this mode, totes are pulled from the storage locations in the stacker section and presented to the operator at the pick station. The operator then picks the specific item(s) from within the tote to fill orders.
- **Replenish Mode** - This mode is used for restocking inventory. An empty (or near empty) tote is presented to the operator to be refilled. The operator then puts the specified amount of items into the iBOT-delivered tote. For more on this procedure, see “Replenish mode” on page 49.

## Starting up the system

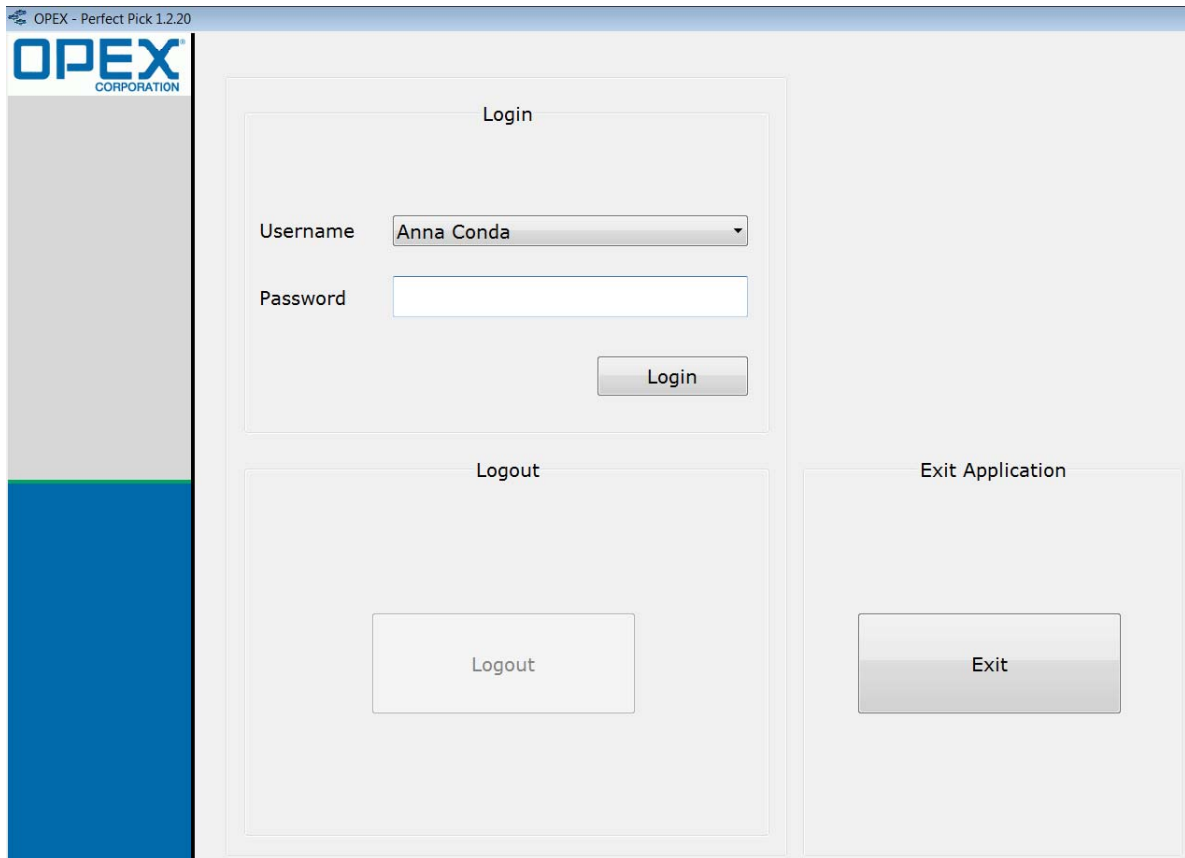
The Perfect Pick HD Host PC will launch the Host software as part of the system’s start-up routine. If you mistakenly close the Host software, or if the Host software does not start with the machine, you can start it manually.

1. If the Host software is not already running, double-click on the Perfect Pick HD icon (Figure 19) on the desktop OR click Start > Programs > OPEX > Perfect Pick HD to open it.



**Figure 19: Perfect Pick HD desktop icon**

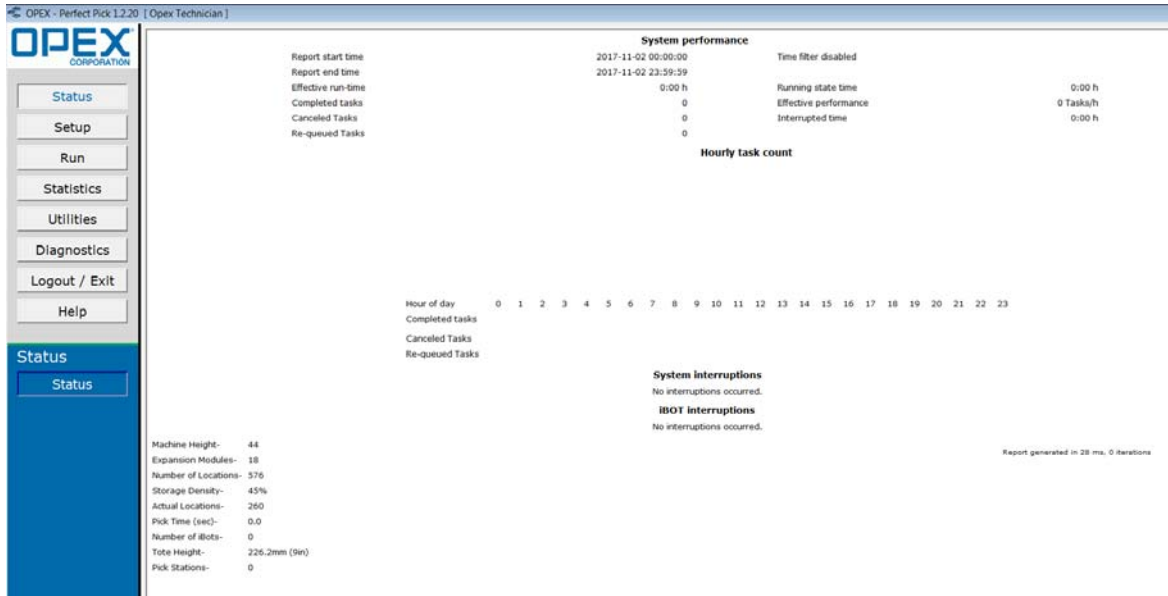
2. The Login screen will appear (Figure 20). Select a Username from the drop-down list.



**Figure 20: Login screen**

3. If required, enter the password for the selected Username.
4. Click Login.

The Host software then displays the Main window (Figure 21).



**Figure 21: Main window**

## Navigating the Host software

The Perfect Pick HD Host software provides the main interface with the system's controls. Used primarily by the OPEX technician (or qualified personnel), the Host software is used to select and run jobs, remove/insert iBOTs, run diagnostic tests, and view statistical reports on the machine.

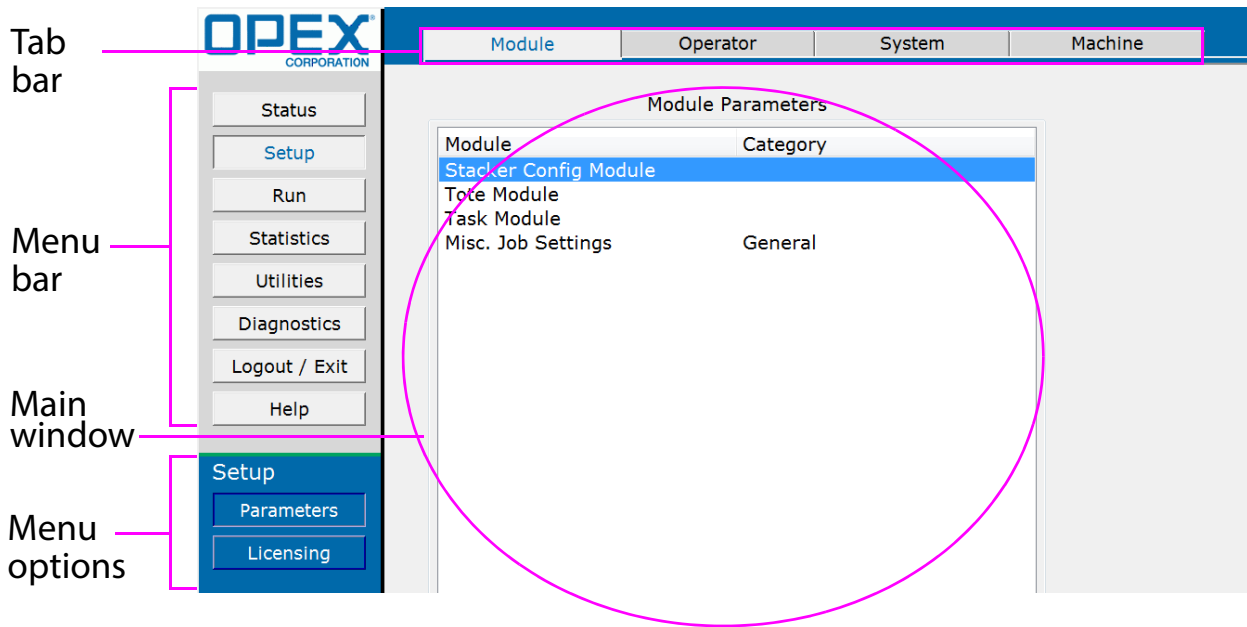
The Host software interface consists of (see Figure 22):

**Menu bar** The vertical menu bar provides access to the main system functions. Select a category from the menu bar and make selections from the main window or the menu options bar.

**Menu options** The menu options provide sub-categories for the selections in the menu bar. The menu options bar will change based on the current menu bar selection.

**Tab bar** Some screens will have tabs, which break the screen down into different categories. Click on the different tabs to access the various settings.

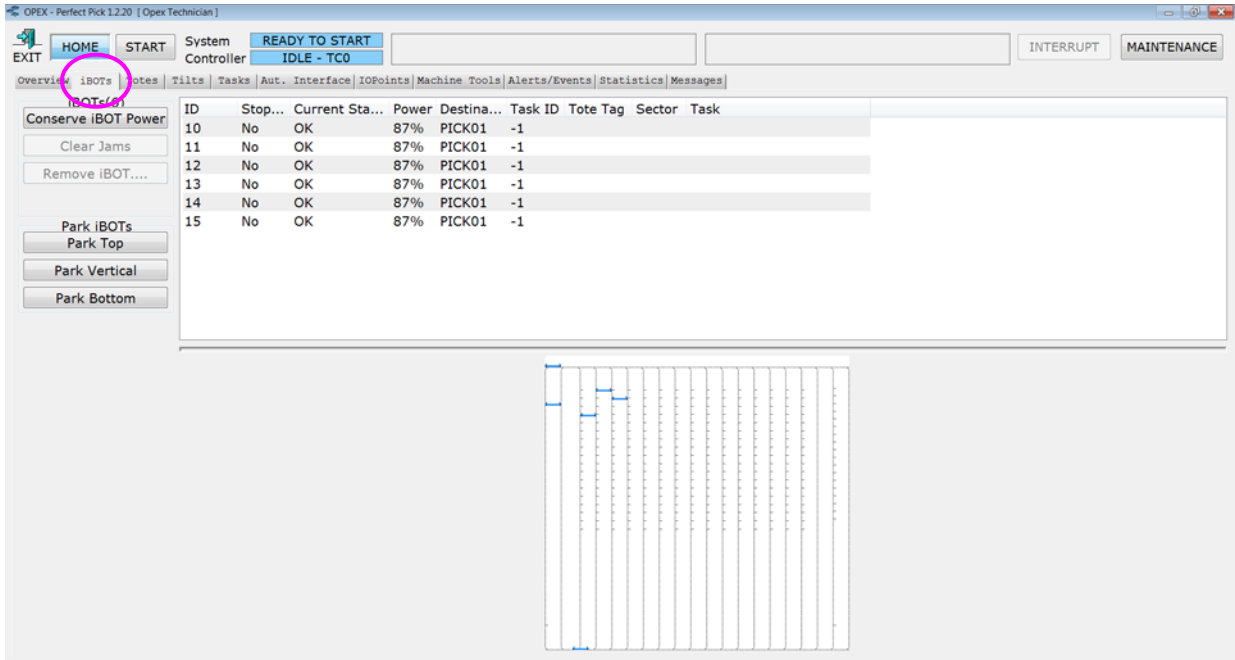
**Main window** View and adjust settings and make selections in the main window.



**Figure 22: Host software interface**

5. Click the Run button found in the Menu bar. The Run screen opens. The run screen offers several tabs for viewing different elements of the machine and

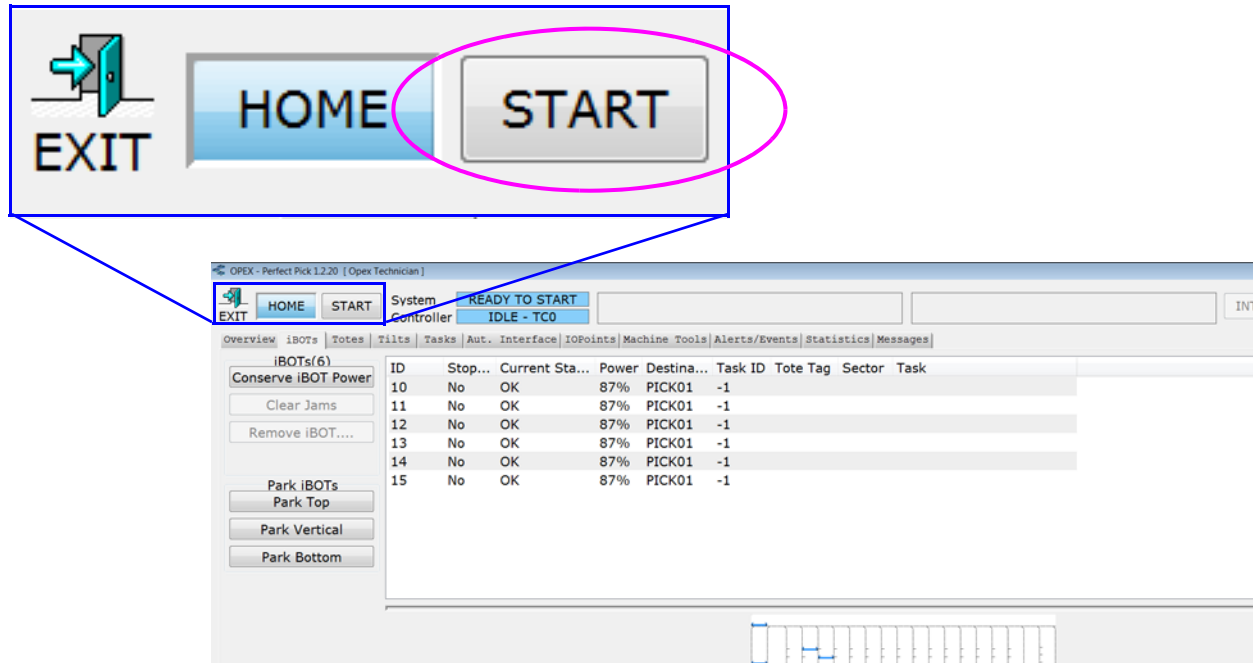
its operational process. One of the most common views is found by clicking the iBOTS tab (see Figure 23).



**Figure 23: Run Screen - iBOTS tab**

6. On this screen, buttons are available for conserving iBOT power, and parking the iBOTS. For more on parking the iBOTS, go to page 58.

7. On the top of the screen, click START (Figure 24).



**Figure 24: Start button location**

8. If you need to run the Perfect Pick HD in Replenish mode, go to “Replenish mode” on page 49. If you plan to run in the normal mode, go to “Continuous mode” on page 40.

## Continuous mode

In Continuous mode, iBOTs deliver totes to the operator in the pick station. The operator then picks the specific item(s) from within the tote and places them in order-request containers located on the Workstation (or a similar conveyor), to the right of the operator. In normal operations, you will primarily use this mode.

1. Start up the Perfect Pick HD system, as described in “Starting up the system” on page 34. When you start up the Perfect Pick HD system, it automatically starts the Cortex system, and displays the Welcome screen (Figure 25).



**Figure 25: Welcome Screen**



2. Log in to the software, and select Auto mode (Figure 26).



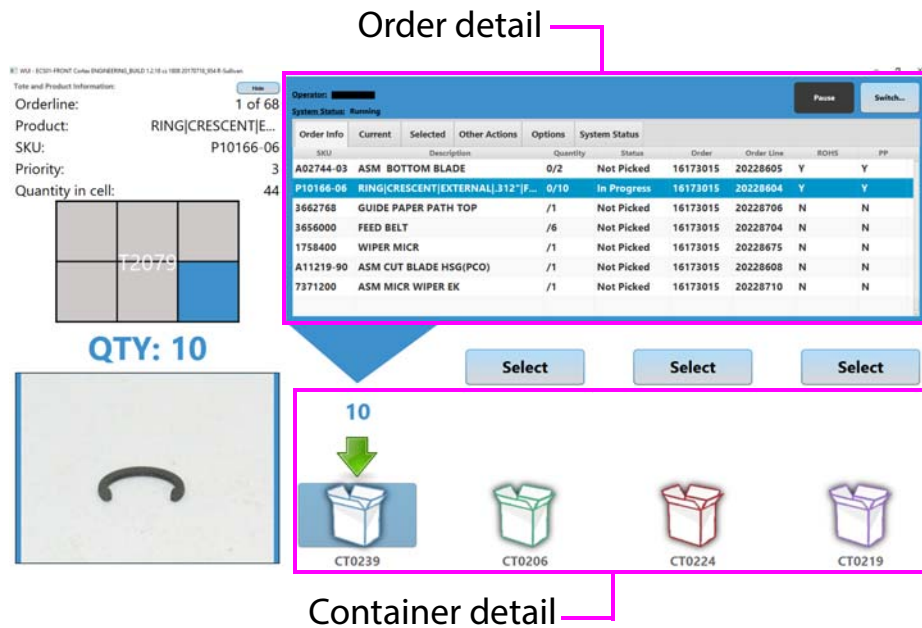
**Figure 26: Auto Mode**

3. Press the green Start button at the Pick Station (Figure 27).



**Figure 27: Start button**

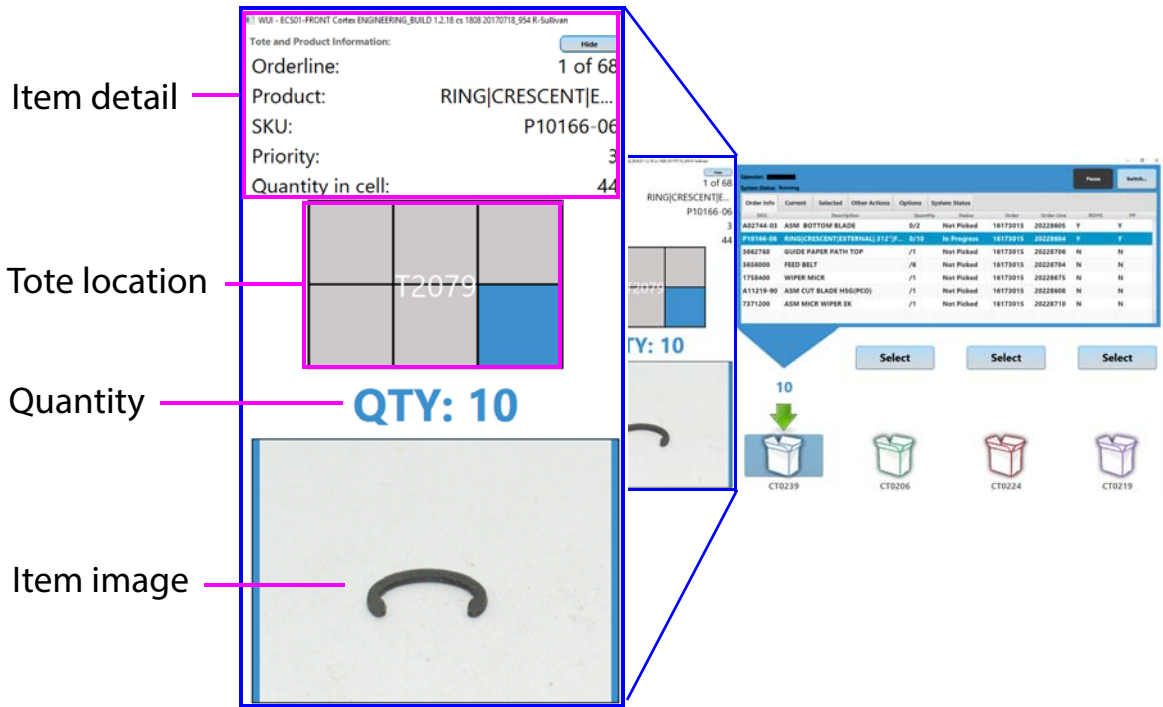
- The iBOTs will move in preparation for the job, and the monitor displays the Cortex run screen (Figure 28).



**Figure 28: Cortex run screen**

- (Referring to Figure 29) The run screen shows: a description of the item to be picked (Item detail), a photo of the item, how many of the items need to be picked (Quantity), and the location of the item within the tote (Tote Location). An iBOT could present one large tote, or a compartmentalized tote.

Figure 29 shows a tote broken up into six parts (tote location), and the operator is directed to pick from the front right quadrant.



**Figure 29: Cortex Run screen - detail**

- To the right of the Perfect Pick HD is the OPEX Workstation - a conveyor with containers (for more details on the OPEX Workstation, see “The OPEX Integrated Workstation” on page 57). As the containers advance toward the Perfect Pick HD, they pass a scanner (shown in Figure 30), which reads the

barcode on each container. The scanned information is used to determine in which container to place the picked parts.



**Figure 30: Container scanner**

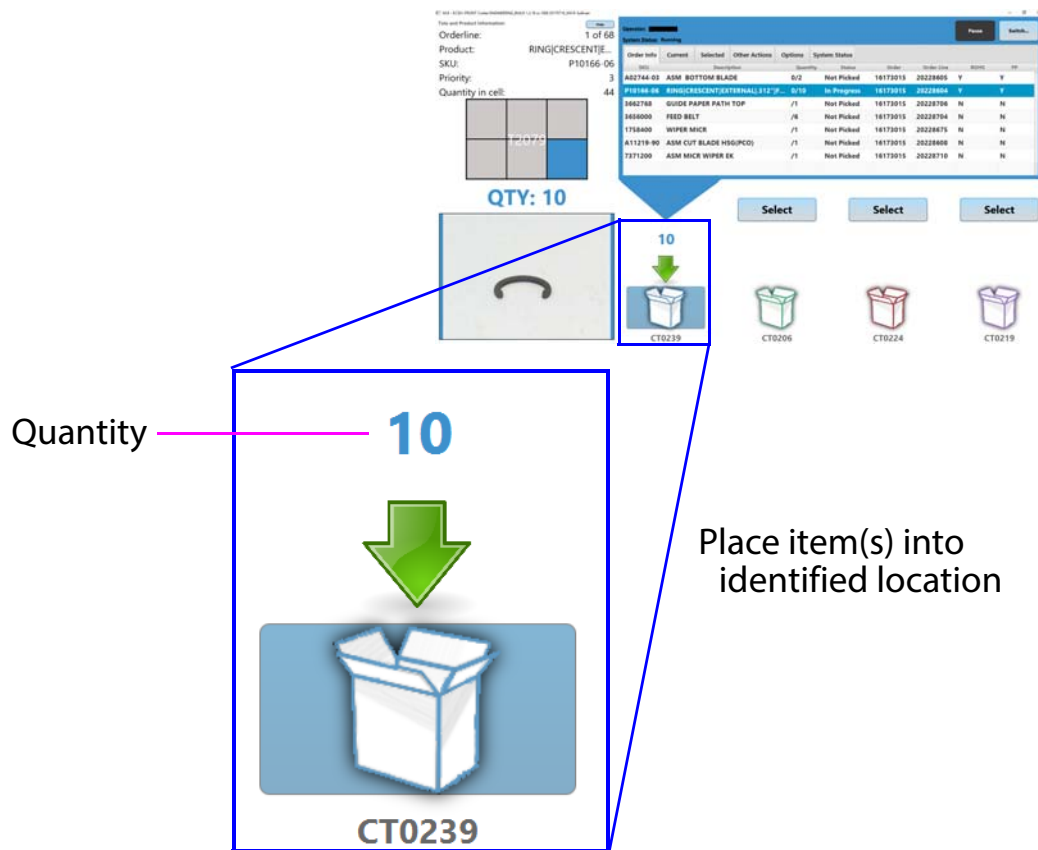
7. The monitor identifies the location of the container on the work station conveyor where the user needs to place the picked part. There are four available locations which are identified by the light bar (see Figure 31). The light bar uses color-coded buttons to assist in identifying the correct container. In the example in Figure 31, the second container has a magenta light, and the third container has a blue light. If the first container was completed, it would be transferred the back conveyor and move on for further processing, such as the addition of items from another area, QC monitoring, or to have the items packaged for shipping. The other

containers would advance, and the color-coding would also advance to follow the containers.



**Figure 31: Light Bar**

- Pick the quantity identified in the interface, and place it into the appropriate container on the Workstation. In the example in Figure 32, 10 items should be placed into the first container on the Workstation.



**Figure 32: Place the item in the container**

Depending on your operation, you might also have to bag the items and place a label on the bag (the labeler is shown in Figure 31).

- Figure 33 shows an example where 32 items are needed for the first container, and one is needed for the second container. These quantities are



identified both on the monitor and the light bar. Put the selected quantity in the correct container(s).



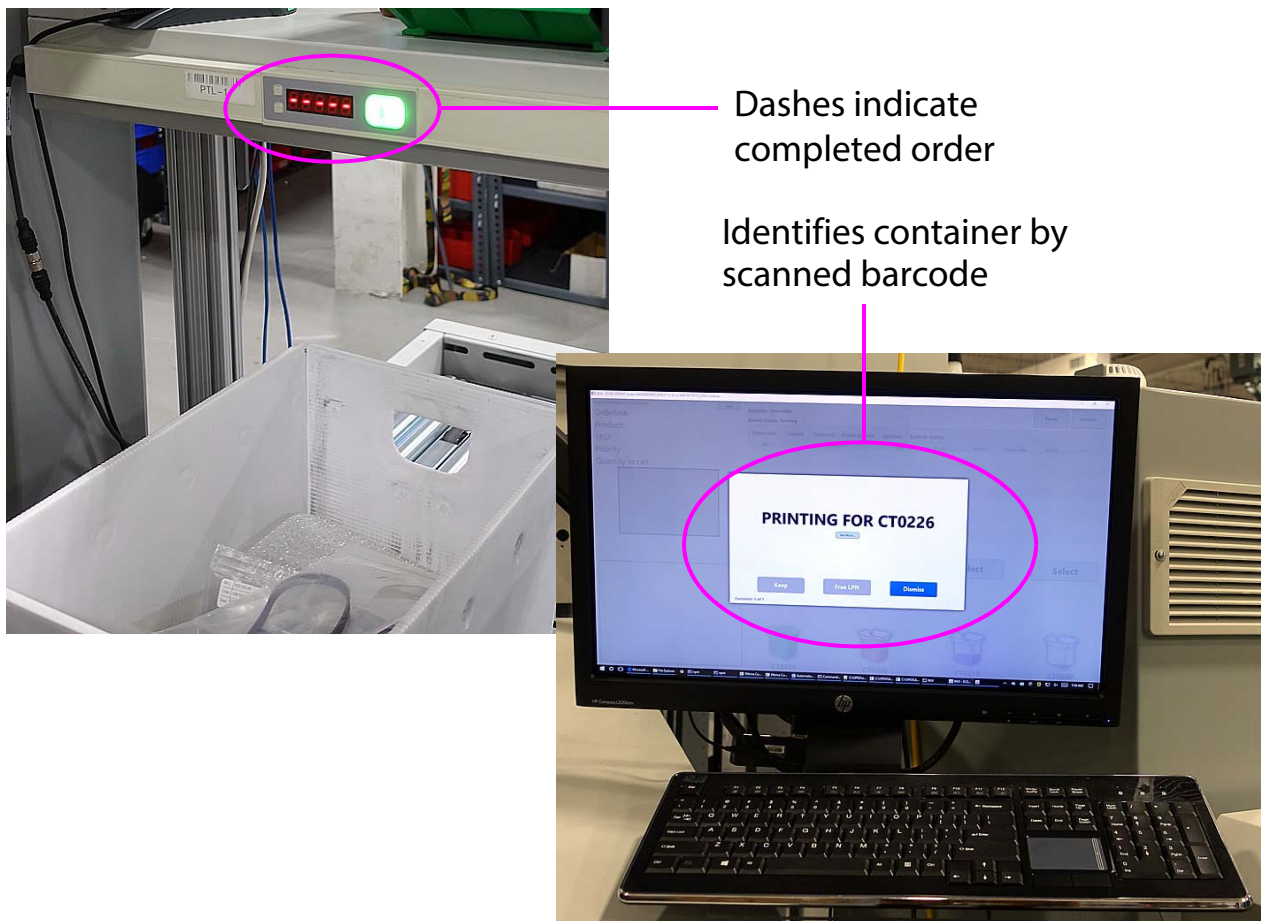
**Figure 33: Displaying the quantity needed**

10. Press the color-coded light bar button. This tells the system that you've picked the part, and the iBOT will exit the picking station, returning the tote to the storage section.

**Note:** In cases like the example in Figure 33, where the same item is needed in more than one container, add the item(s) to the container identified in the monitor first. When all items have been added to that container, press its colored button on the light bar. In this example, the blue button. The monitor then points to the next container that needs the item. Once that is filled, push that container's colored button on the light bar.

11. If more items are needed, an iBOT will bring the next tote to the pick station so that the operator can repeat the process.
12. When an order has been completed (all parts picked for one container), the light bar displays a series of dashes (Figure 34), a packing list is automatically printed, and the monitor displays a “printing for container” message.

**Note:** Depending on your operation, your system may not require a printer.



**Figure 34: Order completed**

13. Place the packing list in the container.
14. Press the color-coded light bar button to send the container to the back conveyor on the workstation, and advance for further processing, such as the addition of items from another area, QC monitoring, or to have the items boxed for shipping.

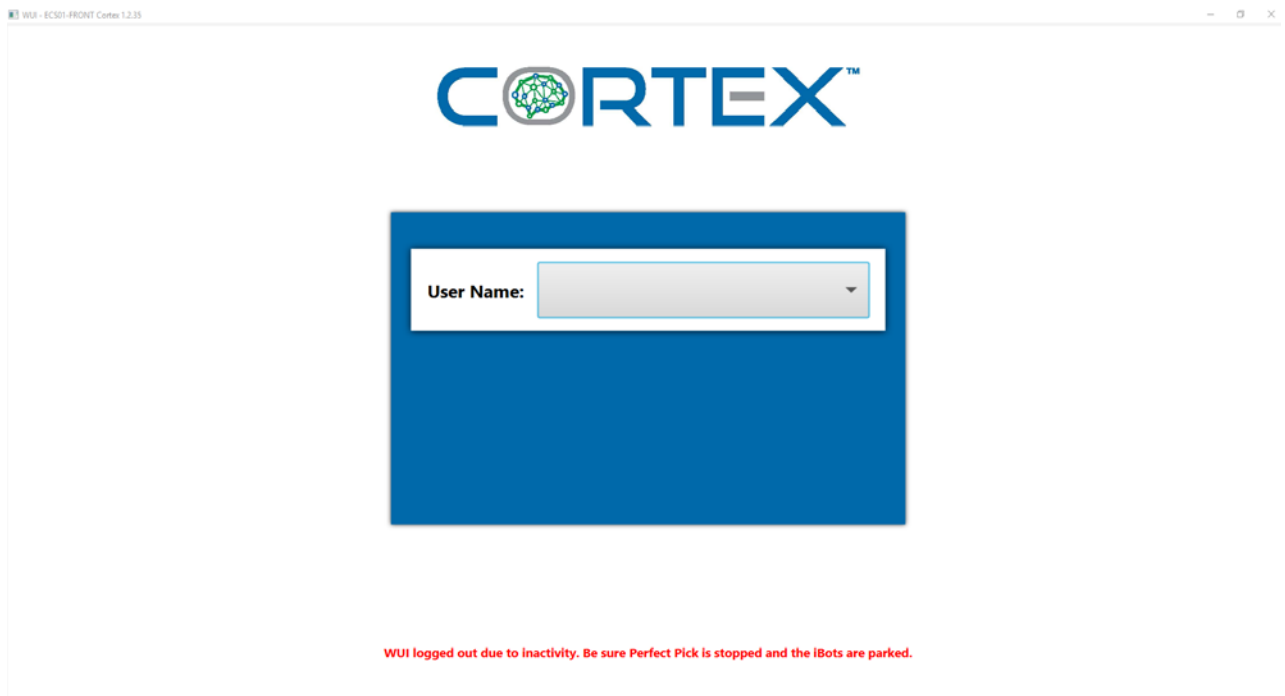
The OPEX Cortex Inventory Control System will provide information as to when the job is finished.



## Replenish mode

Replenish mode is used for restocking inventory.

1. Start up the Perfect Pick HD system, as described in “Starting up the system” on page 34. When you start up the Perfect Pick HD system, it automatically starts the Cortex system, and displays the Welcome screen (Figure 35).



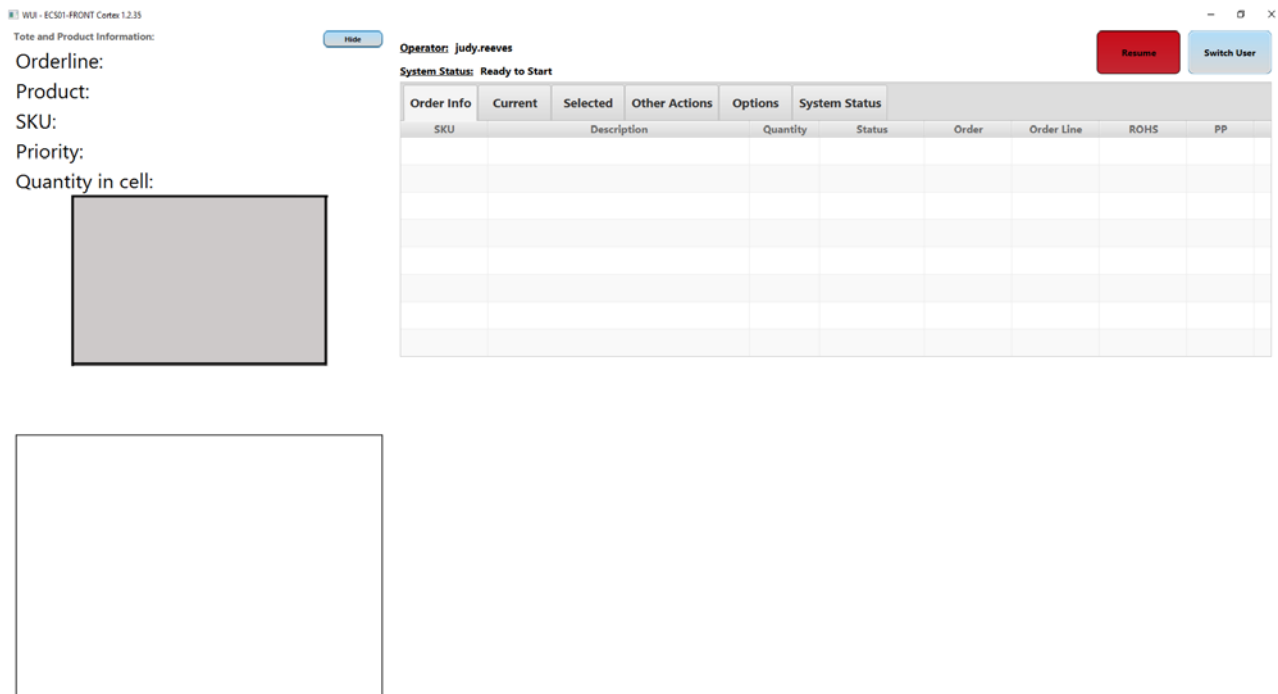
**Figure 35: Welcome Screen**

2. Log in to the software, and select Auto mode (Figure 36).



**Figure 36: Auto Mode**

3. The monitor displays the run screen (Figure 37) and the iBOTs will move, in preparation for the job.



**Figure 37: Run Screen**

4. Press the green Start button at the Pick Station (Figure 38).



**Figure 38: Start button**

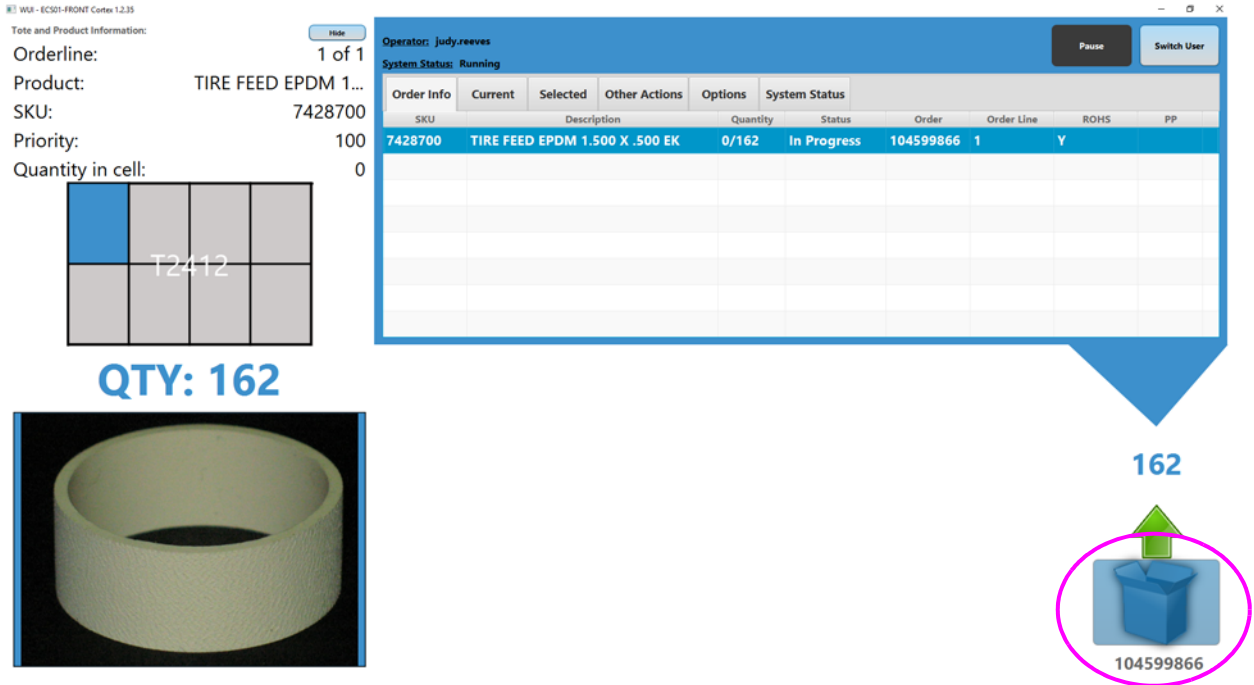
5. The job starts, and the screen now shows the number of items to be replenished (Figure 39), and the location in the tote where to place the

items. In this example, 162 items needed to be added to the top left quadrant of the tote.

**Figure 39: Run Screen - populated**

6. Fill the amount requested into the tote in the pick station, and then on the monitor, press the container that you just used to replenish the item (Figure 40).

**NOTICE:** When running in Replenish mode, you should never restock a tote with items piled higher than the top of the tote. Overfilling the tote will likely cause jams in the machine.



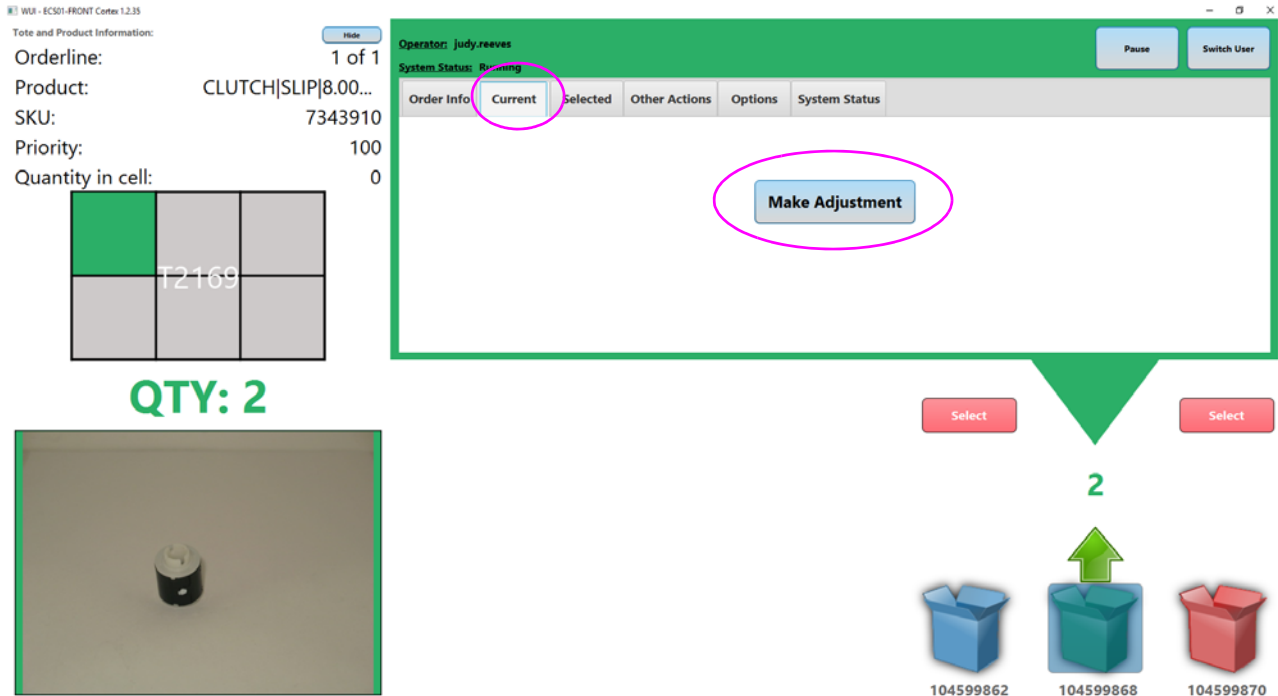
**Figure 40: Press the Container button**

7. To end, wait for the iBOTs to stop. Then hit the green Start button on the pick station. This parks the iBOTs on the bottom charging rail.

## Zeros

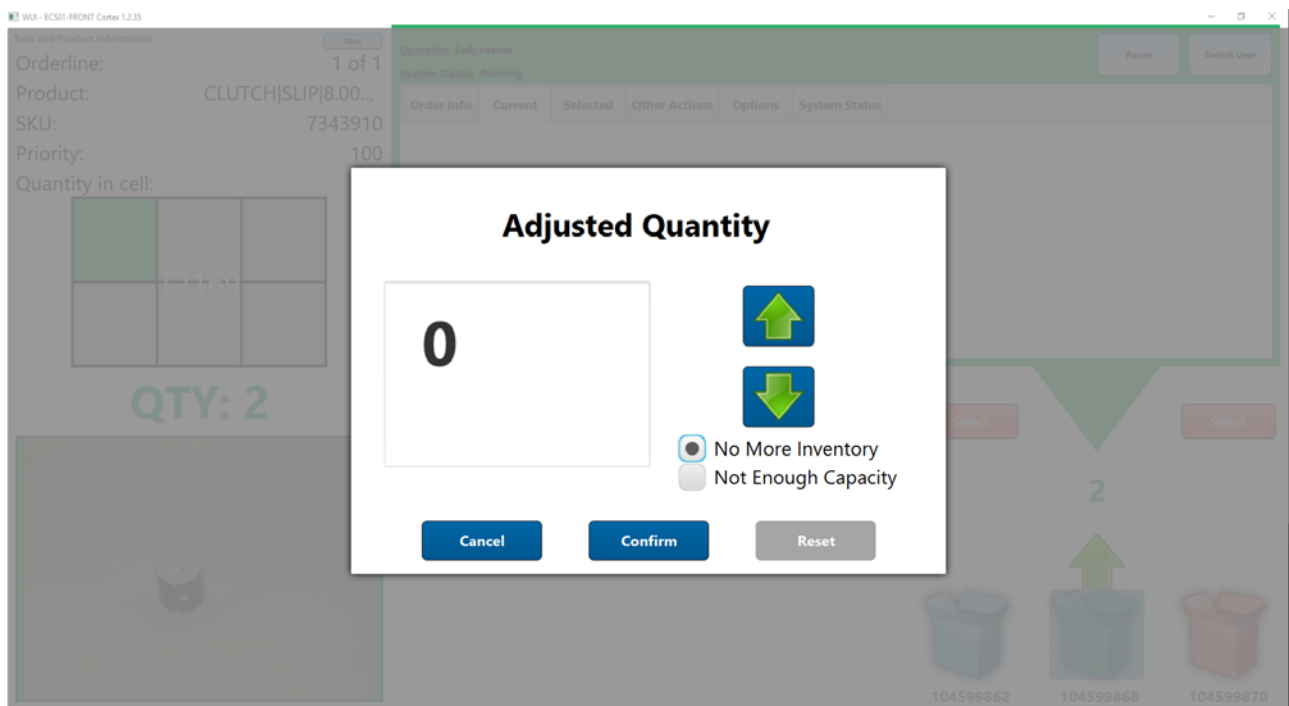
This mode is used to adjust the quantity of items in the system, or when there is no inventory.

1. Perform steps 1 to 3 as described in “Replenish mode” on page 49.
2. Click the Current menu tab, then press the Make Adjustment button (Figure 41).



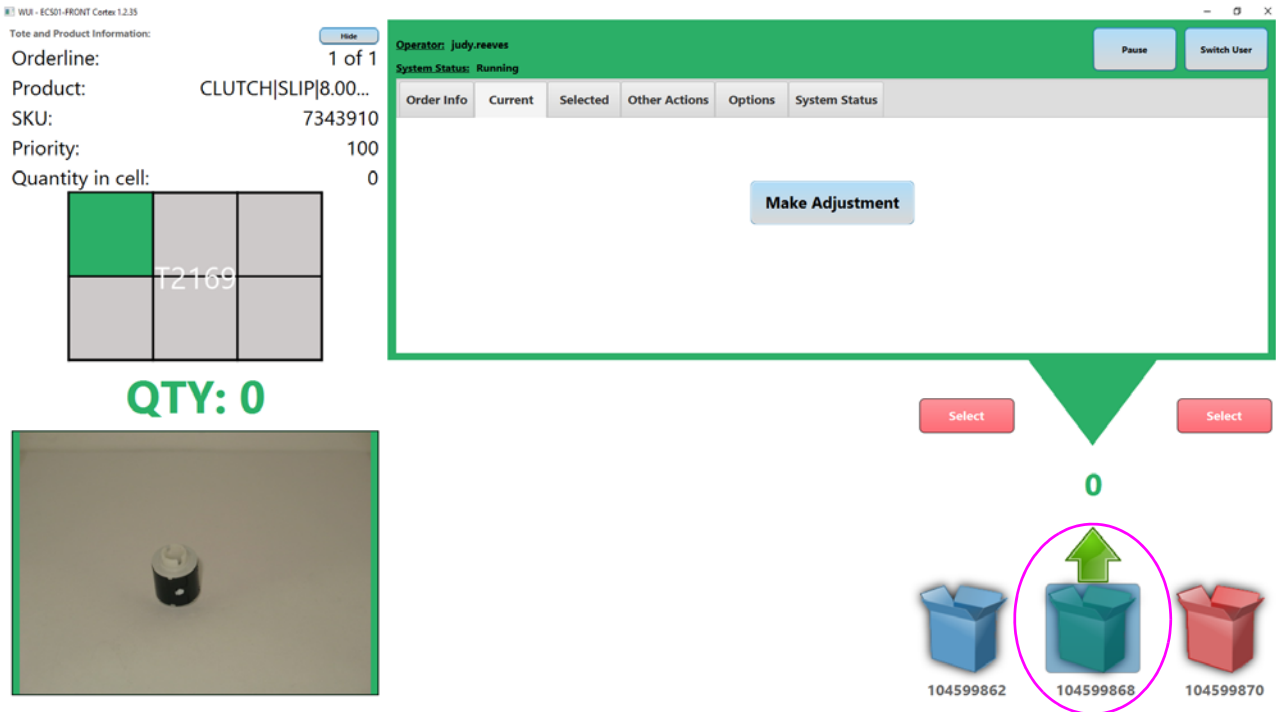
**Figure 41: Current > Make adjustment**

3. Use the Up/Down Arrow buttons to adjust the quantity in the tote (Figure 42).



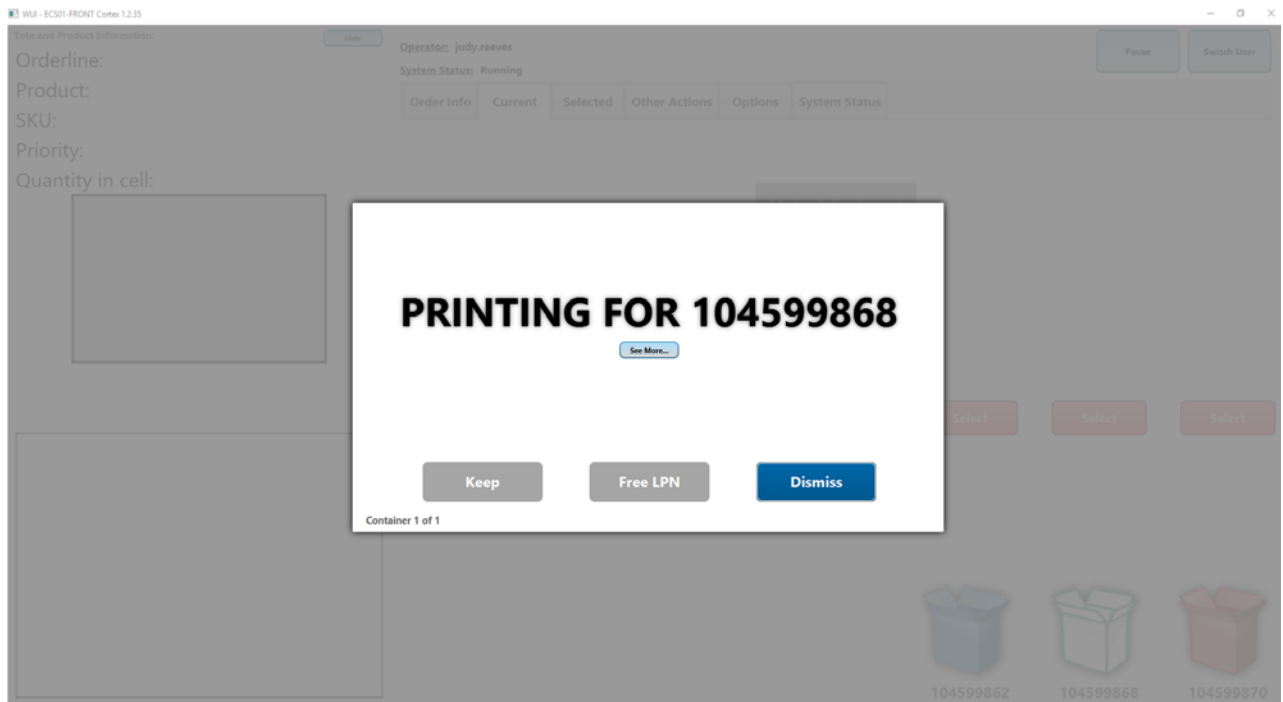
**Figure 42: Adjust Quantity**

4. When the correct quantity is displayed, click Confirm.
5. The screen adjusts to the newly-entered amount. If this amount is correct, click the container (Figure 43).



**Figure 43: Confirm Amount**

- The monitor now displays a printing widow as shown in Figure 44. The number displayed matches the number of the container that was scanned into the system. Click Dismiss.



**Figure 44: Printing message**

- (Depending on how your system is set up), Clicking Dismiss prints a confirmation page.



## The OPEX Integrated Workstation

As individual items are picked from the Perfect Pick® HD, they are placed directly into shipping boxes or totes on the all-new, scalable OPEX® Workstation. Each container moves quietly along the conveyors and across the zero-height transfers to and from its pick-to-light location.

Once the operator completes an order, the container is transferred for final shipment and another order indexes forward on the workstation's conveyor.

The OPEX Workstation is closely integrated with the Perfect Pick HD's hardware and software systems, reducing latencies and optimizing overall system performance.



**Figure 45: The OPEX Workstation**

## How to park the iBOTs

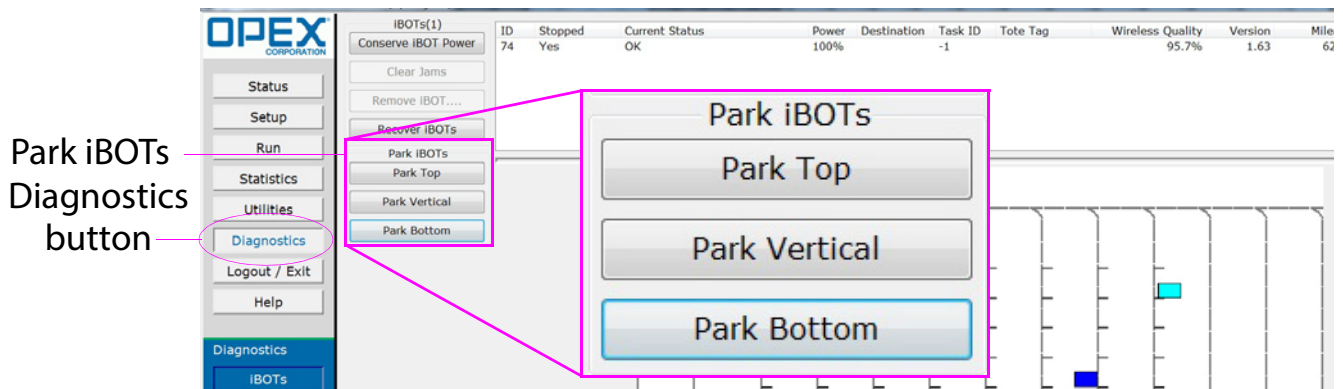
The diagnostics screen on the Host computer shows the status of the iBOTs and their locations, as well as the locations of the totes in real time. Though primarily used by the OPEX technician or authorized personnel, there may be situations where you need to use this software, such as to park the iBOTs at the end of a shift.



**CAUTION:** The actual removal and installation of iBOTs should only be done by a qualified OPEX technician or authorized personnel. These instructions are provided for informational purposes only.

1. At the Perfect Pick HD controls, click the Diagnostics button to display the Diagnostics screen (see Figure 46).

**Note:** If you are on the Run Screen, clicking the iBOTs tab will also display the following information.



**Figure 46: Diagnostics screen**

2. This screen offers three buttons to park the iBOTs at different locations: Park Top, Park Vertical, or Park Bottom. Click the appropriate button. For example, if all iBOTs are running okay, and you need to step away from the machine, or if it's the end of a shift, parking them on the bottom puts all iBOTs on the charging rail. If there is a jammed iBOT, depending on the location and whether the iBOT will be removed from the front or back of the machine, park the iBOTs on the top or vertical.

**Note:** If functional iBOTs are sent to wait at the top of the machine, you will have approximately 2.5 hours before they lose their charge. The Conserve

*iBOT Power button in Diagnostics makes the iBOTs stop sending constant status updates to the machine to save energy.*



# 4 Specifications

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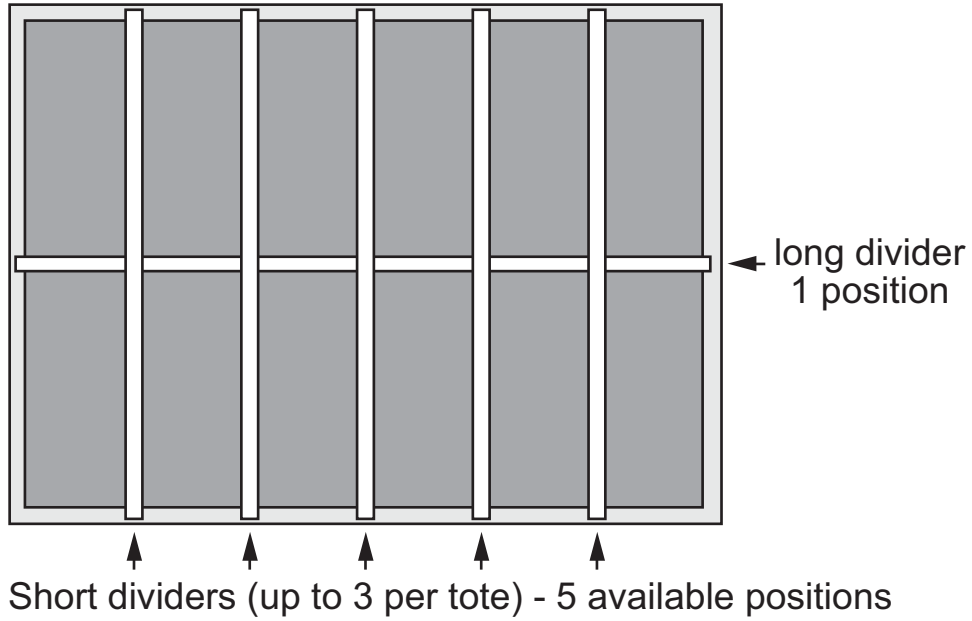
# Specifications

## Physical Specifications:

Height	16.55' to 32.38' (5.04m to 9.87m) - locations scaled at 2' (.61m) increments
Length	Up to 204.9' (62.45m) - 30 expansion modules @ 6.2' (1.89m) each
Width	14' (4.27m) - double deep tote storage
Pick Stations	Up to 2 - available ground and mezzanine levels, designed for picking and replenishment
iBOTs	10 to 20
Totes	<ul style="list-style-type: none"><li>• Height: 8", 10", 12" and 14" (20.32cm, 25.4cm, 30.48cm and 35.56cm)</li><li>• Width: 29.75" (75.57cm)</li><li>• Length: 20.9" (53.09cm)</li></ul>

## iBOT Specifications:

iBOT Load Specifications	80 lbs. (36.29kg) including tote
Performance	Up to 1,000 dual cycles per hour Up to 146,400 unique storage locations Up to 26,400 cubic feet of dense storage Up to 12,200 totes  * all within a single aisle of Perfect Pick HD



**Figure 47: Tote dividers (drawing not to scale)**

# Wireless Transceiver

## FCC information / informations FCC

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

The wireless transceiver antennae must not be modified or, replaced with that of a different type. Servicing of the transceiver is limited to properly trained OPEX technicians. No end-user servicing is permitted.

Changes or modifications not expressly approved by OPEX Corporation could void the user's authority to operate the equipment.

Module cannot be co-located with other antenna or transmitter except as specified in the grant condition of equipment authorization; other electronic functions not associated with the certified module or certified transmitter may require additional equipment authorization. The module should not be marketed and sold in a way that have to be end-user accessible/replaceable. A host product is required to comply with all applicable FCC equipment authorizations regulations, requirements and equipment functions not associated with the transmitter module portion. To ensure compliance with all non-transmitter functions the host manufacturer is responsible for ensuring compliance with the module(s) installed and fully operational.

Users and persons nearby the equipment will maintain a minimum 20 cm (8") separation distance from device antenna.

FCC ID VDM2048910 Model 2048910 (Earlier Version)

FCC ID VDM 2054710 Model 2054710 (Current Version)

Cet appareil est conforme à la partie 15 des règles de la FCC. Son fonctionnement est soumis aux deux conditions suivantes: (1) ce dispositif ne doit pas causer d'interférences nuisibles, et (2) cet appareil doit accepter toute interférence reçue, y compris les interférences qui peuvent provoquer un fonctionnement indésirable.

Les antennes d'émission-réception sans fil ne doit pas être modifié ou remplacé par celui d'un autre type. Entretien de l'émetteur-récepteur est limitée



à une formation adéquate des techniciens OPEX. Pas de service de l'utilisateur final est autorisé.

Les changements ou modifications non expressément approuvés par OPEX Corporation pourraient annuler l'autorité de l'utilisateur à utiliser l'équipement.

Module ne peut pas être co-localisé avec autre antenne ou émetteur, sauf comme indiqué dans l'état de la délivrance de l'autorisation de l'équipement; d'autres fonctions électroniques ne sont pas associés avec le module émetteur certifié ou certifié peuvent exiger une autorisation de matériel supplémentaire. Le module ne doit pas être commercialisé et vendu d'une manière qui doivent être l'utilisateur final accessible / remplaçable. Un produit d'accueil est tenu de se conformer à toutes les autorisations applicables FCC d'équipement règlements, des exigences et des fonctions de l'équipement ne sont pas associés avec la partie de module émetteur. Pour assurer la conformité avec toutes les fonctions non-émetteur le fabricant hôte est responsable d'assurer la conformité avec le module (s) installé et pleinement opérationnel.

Les utilisateurs et les personnes à proximité de l'équipement seront de maintenir un minimum de 20 cm (8") de la distance de séparation de l'antenne de l'appareil.

FCC ID VDM2048910 Model 2048910 (Version Précédente)

FCC ID VDM 2054710 Model 2054710 (Version Actuelle)

## **Industry Canada information / Industrie Canada l'information**

According to RSS-Gen Issue 4 Section 8.3:

This radio transmitter IC: 7175A-2048910 has been approved by Industry Canada to operate with the antenna types listed below with the maximum permissible gain indicated.

Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

Internal antenna: Inverted F PCB (gain: 2.2 dBi); or,

External antenna: Digi-International A24-HASM-450 (gain 2.14 dBi)

According to RSS-Gen Issue 4 Section 8.4:

This device complies with Industry Canada's license-exempt RSSs. Operation is subject to the following two conditions:

1. This device may not cause interference; and
2. This device must accept any interference, including interference that may cause undesired operation of the device.

Selon RSS-Gen Numéro 4 Section 8.4:

Cet appareil est conforme aux CNR exempts de licence d'Industrie Canada. Son fonctionnement est soumis aux deux conditions suivantes:

1. Ce dispositif ne peut causer des interférences; et
2. Ce dispositif doit accepter toute interférence, y compris les interférences qui peuvent causer un mauvais fonctionnement de l'appareil.

IC : 7175A-2048910 Model 2048910 (Earlier Version/Version Précédente)

IC : 7175A-2054710 Model 2054710 (Current Version/Version Actuelle)

## Contacting OPEX Service

OPEX Technical Support can be reached at:

1-800-673-9288

OR

856-727-1950

OPEX Technical Support  
835 Lancer Drive  
Moorestown, NJ 08057