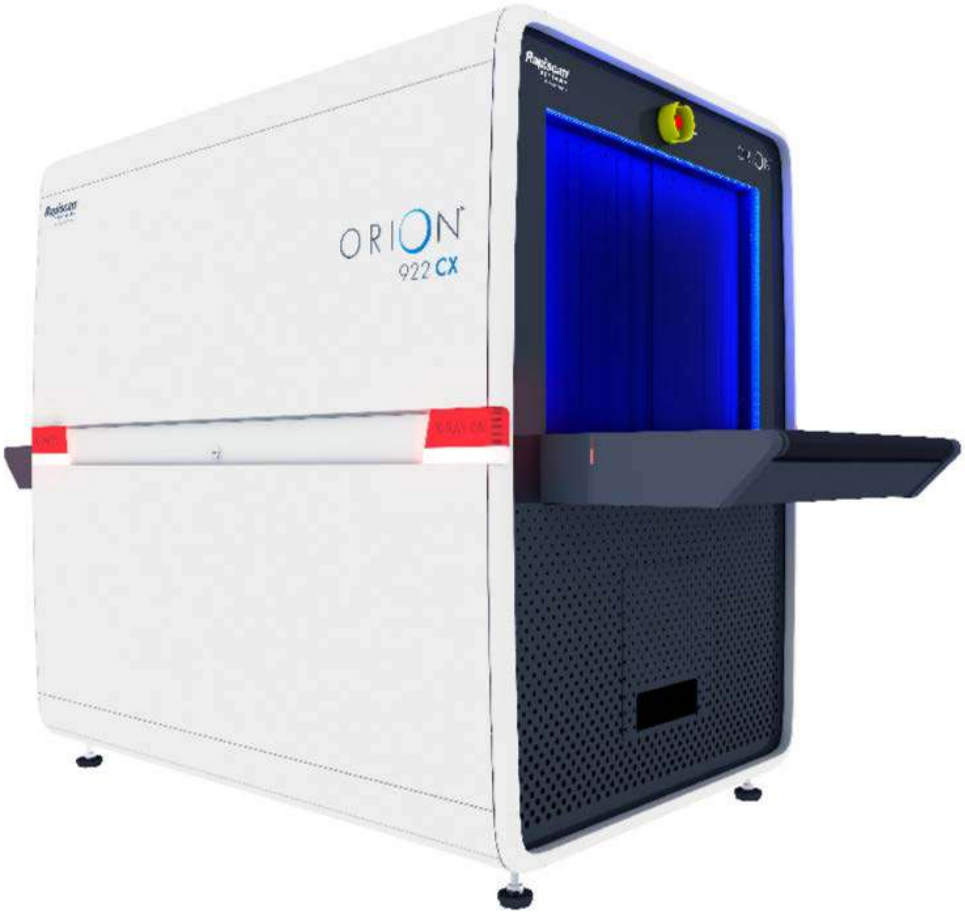
Rapiscan systems
An OSI Systems Company

# Operator's Manual




# Rapiscan 9xx Series Models
# Security Screening
# X-ray Systems



**June 4, 2019**
**Document Number: 101013515**
**Rev 3**



www.rapiscansystems.com

# REVISION HISTORY

| Rev | ECO | Issue Date | Name | Comments |
|---|---|---|---|---|
| 1 | 15566 | May 2018 | DZ | Initial Release |
| 2 | 16546 | Oct 2018 | DZ | Updated Cover to show an image of a CX X-ray System Scanner and to indicate a revised Date and Revision.<br>Updated Table of Contents.<br>Updated electrical rating in Table 4 for 918CX.<br>Updated Acronyms, Terms, and Definitions in Table 5.<br>Updated Reference Documents in Table 7.<br>Deleted old Table 6 no longer required. Information is now in Section 3.1: Controls and Indicators.<br>Updated Controls and Indicators in Chapter 3, Table 8.<br>Added new paragraph headings 3.3.1, Fixed Zoom and 3.3.2, Dynamic Zoom.<br>Updated physical pictures.<br>Updated Sections 3.7 through 3.7.12.2.<br>Updated Section 3.7.15: Real Time Mode.<br>Updated Section 3.7.16: Stop Mode.<br>Added Sections 3.7.17: Auto Reset on Scan and 3.7.18: Auto Reset on New Bag.<br>Updated Sections 4.6.1 through 4.7.3.<br>Updated Screener Scan Mode in Chapter 5 to add descriptions and screen shots in accordance with most current ScanOS Software.<br>Added software options in Appendix C. Renumbered figures and tables accordingly.<br>Updated Appendix D, Contact Information<br>Minor corrections throughout. |

| Rev | ECO | Issue Date | Name | Comments |
|---|---|---|---|---|
| 3 | 19852 | Nov 2018 | DZ | Updated cover to indicate revised date and Revision.<br>Updated footers to indicate new Revision.<br>Corrected descriptions for Caution Labels in Front Matter.<br>Updated Table of Contents.<br>Updated Section 5.1 Color Lookup Table (LUT).<br>Updated Section 5.2.3 Help Manuals.<br>Updated Section 5.2.4 System Information.<br>Minor corrections. |
| | | Jan. 2019 | YW | Added a Power Cord Warning on page#viii to Table 1 to address that power cord needs to be rated sufficiently as the machine rating.<br>Move Electrical Rating from 1.7 to 1.8.<br>Changed 1.7 to General Specifications<br>Changed Electrical Rating from Table 4 to Table 5, added AC Input Current Rating to Table 5.<br>Renumbered Sections 1.8 through 1.11.<br>Add 1.10 Environmental Specifications<br>Renumbered tables accordingly.<br>Added 3.8 System Indicator Lights, Figure 39 System Power ON Indicator and Figure 40 X-ray ON Indicator and Search Indicator<br>Renumbered the Figures accordingly.<br>Added Canadian label Kit as Appendix D.<br>Renumbered Contact Information to Appendix E. |
| | | May 2019 | YW | Add French translation on all the precaution & warning statements.<br>Update to cover all 9xx models |
| | | June 2019 | BC | Update from 9xxCX to 9xx Series |

## Proprietary Statement

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## Technical Support

For technical assistance, refer to APPENDIX E.

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# WARNINGS AND CAUTIONS SUMMARY

The Rapiscan 9xx Model Series Security X-ray Systems are equipped with both conventional safety equipment and radiation safety equipment, which is designed to reduce the possibility of accidents and keep areas safe during scanning operation.

To make these models as safe as possible to operate, the entire system must be installed, operated, and maintained in accordance with the procedures and guidelines provided in this manual.

It is important for all operators to be aware of and understand the purpose and operational procedures related to all safety features and equipment of the system being operated.

## Caution Labels

The caution label shown in Figure 1 is provided on the Operator Control Panel (OCP).


**Figure 1: Operator Control Panel Warning Label**

The caution label shown in Figure 2 is permanently affixed on the X-ray system at the entrance and exit ports.


**Figure 2: X-ray Tunnel Caution Label (Outside Both X-ray Tunnels)**

The warning label shown in Figure 2 is permanently affixed on the low conveyor on 928DX machines.

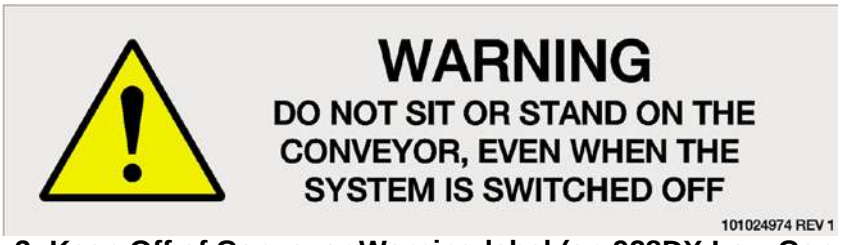



**Figure 3: Keep Off of Conveyor Warning label (on 928DX Low Conveyor)**

**For all units sold in Canada, Health Canada Radiation Emitting Devices (RED) Act regulations require the X-radiation warning signs to:**

- be shown in two contrasting colors,
- be clearly visible and identifiable from a distance of one meter,
- contain no outer dimensions less than two centimeters,
- bear the words **CAUTION**, **X-RAYS** and **ATTENTION, RAYONS X**; and,
- be designed in accordance with the following diagram.

The international trefoil radiation symbol is **NOT** permitted on X-ray systems sold in Canada. The trefoil symbol may only be used in Canada when a device contains radioactive materials. Canadian REDA regulations require the X-ray symbol and wording be used on all baggage X-ray systems: therefore, Rapiscan Systems has provided all systems sold in Canada only the proper Canadian labels, and affixed these labels in their proper locations in accordance with the REDA regulations.

**No Rapiscan Systems baggage X-ray inspection system contains radioactive material.**

## Warnings and Definitions (Avertissements et definitions)

Warnings and definitions are listed and described in Table 1.

**Table 1: Warnings and Definitions (Avertissements et definitions)**

| Warning | Definition |
|---|---|
|  | **WARNING:** Do not service until all power is secure. Safely remove AC power from machine and unplug power cord. Follow general lockout tag out procedure. Please note that Rapiscan machines do not come with locks for this procedure. Customers are responsible for providing lockout/tag out equipment and installing it at their facility power (circuit breaker).<br><br>**AVERTISSEMENT:** *Ne pas servir jusqu'à ce que toute la puissance soit sécurisée. Retirez en toute sécurité l'alimentation C.A. de la machine et débranchez le cordon d'alimentation. Suivez la procédure de verrouillage général de la balise. Veuillez noter que les machines Rapiscan ne sont pas équipées de serrures pour cette procédure. Les clients sont responsables de fournir l'équipement de verrouillage/étiquetage et de l'installer à leur puissance d'installation (disjoncteur).* |

| Warning | Definition |
|---|---|
|  | **WARNING:** Read completely before operating this equipment.<br><br>This baggage X-ray inspection system is designed to provide safe and efficient operation. All X-ray inspection systems have inherent dangers and must be operated with safety as a number one priority. Only trained and qualified operators and maintenance personnel should operate or perform maintenance on this equipment.<br><br>**AVERTISSEMENT:** *Lire complètement avant d'utiliser cet équipement.*<br><br>*Ce système d'inspection par rayons X pour bagages est conçu pour assurer un fonctionnement sûr et efficace. Tous les systèmes d'inspection par rayons X ont des dangers inhérents et doivent être exploités avec sécurité comme priorité numéro un. Seuls les opérateurs formés et qualifiés et le personnel de maintenance doivent opérer ou effectuer la maintenance de cet équipement.* |
|  | **WARNING:** No person must commit any acts that cause unsafe events on an X-ray system when it is in operation. Lifting the lead drapes for any reason when the X-ray beam is on, or exposing any part of the body to the primary X-ray beam, or covering the **X-RAY ON** lights or X-ray warning labels are examples of unsafe events.<br><br>**AVERTISSEMENT:** *Aucune personne ne doit commettre des actes qui causent des événements dangereux sur un système de radiographie quand il est en fonctionnement. Soulever les rideaux de plomb pour quelque raison que ce soit lorsque le faisceau de rayons X est allumé, ou exposer une partie du corps au faisceau de rayons X primaire, ou couvrant les feux **X-RAY ON** ou les étiquettes d'avertissement de rayons X sont des exemples d'événements dangereux.* |
|  | **WARNING:** Never insert your hands, arms or any other part of the body into the cabinets scanning area when **X-RAYS ON**. If the operator must be within the cabinets scanning area for a legitimate reason, ensure the X-ray machine is turned **OFF** while the operator is in this area. The operator MUST caution all material handlers about this requirement.<br><br>**AVERTISSEMENT:** *Ne jamais insérer les mains, les bras ou toute autre partie du corps dans la zone de balayage des armoires lorsque **X-RAYS ON**. Si l'opérateur doit être dans la zone de balayage des armoires pour une raison légitime, assurez-vous que la machine à rayons X est **éteinte** pendant que l'opérateur se trouve dans cette zone. L'opérateur doit avertir tous les gestionnaires de matériaux de cette exigence.* |

| Warning | Definition |
|---|---|
|  | **WARNING:** Ensure all safety controls, warning indicators, and warning labels are functioning and in good condition before operating the unit. Replace if warning indicators are not functioning or if labels are no longer discernible prior to operation.<br><br>**AVERTISSEMENT:** *Assurez-vous que tous les contrôles de sécurité, les indicateurs d'avertissement et les étiquettes d'avertissement fonctionnent et en bon état avant d'utiliser l'appareil. Remplacer si les indicateurs d'avertissement ne fonctionnent pas ou si les étiquettes ne sont plus discernables avant le fonctionnement.* |
|  | **WARNING:** The baggage X-ray inspection system must be located in such a way that under conditions of use, members of the general public, excluding staff authorized to work with or near the system and those individuals whose baggage (or belongings) is to be screened, must be more than 2 meters away from the X-ray inspection system.<br><br>**AVERTISSEMENT:** *Le système d'inspection par rayons X des bagages doit être situé de manière à ce que, dans les conditions d'utilisation, les membres du grand public, à l'exclusion du personnel autorisé à travailler avec ou à proximité du système et des personnes dont les bagages (ou les biens) doivent être projetés, soient plus à moins de 2 mètres du système d'inspection par rayons X.* |
|  | **WARNING:** Moving and/or relocating the baggage X-ray inspection system can affect components critical to safety. If the baggage X-ray inspection system is moved and/or relocated, maintenance personnel and/or other suitably qualified person(s) must test and ensure all safety interlocks are functioning properly as intended by design; examine and ensure all radiation shielding is free from structural damage (e.g., puncture, hole, dent, missing part); examine and ensure the lead clamps that hold the anode and cathode terminals onto the chassis of the X-ray tube housing assembly are positioned correctly; conduct the normal in-beam quality imaging tests and, if discrepancies exist, investigate the X-ray tube assembly, the collimator setting, and the radiation exposure parameters (tube current, high voltage, filters, etc.) for possible causes; and ensure all problems are resolved satisfactorily before the X-ray inspection system is placed into operation.<br><br>**AVERTISSEMENT:** *Le déplacement et/ou la relocalisation du système d'inspection par rayons X des bagages peuvent affecter les composants essentiels à la sécurité. Si le système d'inspection par rayons X des bagages est déplacé et/ou relocalisé, le personnel d'entretien et/ou toute autre personne dûment qualifiée doit tester et s'assurer que tous les interverrouillages de sécurité fonctionnent correctement comme* |

| Warning | Definition |
|---|---|
| | *prévu par la conception; examiner et s'assurer que tout blindage contre les rayonnements est exempt de dommages structurels (p. ex. perforation, trou, dent, pièce manquante); examiner et veiller à ce que les pinces à plomb qui maintiennent les bornes de l'anode et de la cathode sur le châssis de l'ensemble du boîtier du tube à rayons X soient correctement positionnées; effectuer les essais normaux d'imagerie de qualité dans le faisceau et, s'il y a des écarts, étudier l'assemblage du tube à rayons X, le réglage du collimateur et les paramètres d'exposition aux rayonnements (courant de tube, haute tension, filtres, etc.) pour les causes possibles; et s'assurer que tous les problèmes sont résolus de manière satisfaisante avant que le système d'inspection X-ray ne soit mis en service.* |
|  | **WARNING:** The baggage X-ray inspection system must be thoroughly tested and verified by trained and qualified personnel to ensure all radiation shielding components and safety devices, including warning lights are installed and functioning, before the X-ray system is operated.<br><br>**AVERTISSEMENT:** *Le système d'inspection par rayons X des bagages doit être soigneusement testé et vérifié par du personnel formé et qualifié pour s'assurer que tous les composants de protection contre les rayonnements et les dispositifs de sécurité, y compris les feux d'avertissement sont installés et fonctionnent, avant que le système X-ray ne soit Exploité.* |
|  | **WARNING:** No person must create a physical or mechanical condition that ultimately makes the X-ray inspection system unsafe to operate. Defeating safety devices, placing liquid-filled containers on the X-ray inspection system, positioning X-ray inspection systems in confined spaces for carrying out routine maintenance and operational test functions, and positioning X-ray inspection systems for use in areas exposed to rain or snow are examples of hazardous conditions.<br><br>**AVERTISSEMENT:** *Aucune personne ne doit créer une condition physique ou mécanique qui, en fin de compte, rend le système d'inspection à rayons X dangereux pour fonctionner. Vaincre les dispositifs de sécurité, placer des récipients remplis de liquide sur le système d'inspection par rayons x, positionner les systèmes d'inspection par rayons X dans des espaces confinés pour effectuer des opérations de maintenance et de test de routine, et positionner les systèmes d'inspection par rayons X pour une utilisation dans des zones exposées à la pluie ou à la neige sont des exemples de conditions dangereuses.* |

| Warning | Definition |
|---|---|
|  | **WARNING:** Do not remove any conveyor covers or shrouds at any time during X-ray inspection operations. These covers are intended to prevent the insertion of any part of the body into the primary X-ray beam and to maintain radiation levels at or near the entry and exit ports of the cabinet to as low as reasonably achievable and within regulatory radiation leakage limitations.<br><br>**AVERTISSEMENT:** *Ne retirez pas les couvertures de convoyeur ou les hauots à tout moment pendant les opérations d'inspection par rayons X. Ces couvertures sont destinées à empêcher l'insertion de toute partie du corps dans le faisceau de rayons X primaire et à maintenir les niveaux de rayonnement à ou près des ports d'entrée et de sortie de l'armoire à aussi bas que raisonnablement réalisable et dans les fuites de rayonnement réglementaire Limitations.* |
|  | **WARNING:** Electric Shock Hazard: DO NOT contact or touch electrical wire terminals by hand or with a conductive tool.<br><br>**AVERTISSEMENT:** *Risque de choc électrique: NE PAS contacter ou toucher les bornes du fil électrique à la main ou avec un outil conducteur.* |
|  | **WARNING:** Pinch Hazard: DO NOT contact or touch the moving conveyors during operations.<br><br>**AVERTISSEMENT:** *Risque de pincement: NE PAS contacter ou toucher les convoyeurs en mouvement pendant les opérations.* |
|  | **WARNING:** The apparatus must have an earth connection. This is normally supplied through the power cord.<br><br>**AVERTISSEMENT:** *L'appareil doit être connecté à la terre. Ceci est normalement fourni par le cordon d'alimentation.* |
|  | **WARNING:** The power cord should be fitted with the appropriate plug for the country of destination; it should be rated sufficiently as the machine rating and be approved by the applicable safety standard in the country of installation.<br><br>**AVERTISSEMENT:** *Le cordon d'alimentation doit être muni de la fiche appropriée pour le pays de destination; il doit être évalué suffisamment comme la notation de la machine et être approuvé par la norme de sécurité applicable dans le pays d'installation.* |

| Warning | Definition |
|---|---|
|  | **WARNING:** Do not sit or stand on the conveyor, even when the system is switched off.<br>**AVERTISSEMENT:** *Ne pas s'asseoir ou se tenir sur le convoyeur, même lorsque le système est éteint.*<br><br>**WARNING:** Do not remove any service panels during X-ray inspection operations. All maintenance must be performed by qualified maintenance or service technicians while the X-ray generator is secured.<br>**AVERTISSEMENT:** *Ne retirez pas les panneaux de service pendant les opérations d'inspection par rayons X. Tout entretien doit être effectué par des techniciens d'entretien ou de maintenance qualifiés pendant que le générateur de rayons X est sécurisé.* |
|  | **WARNING:** To minimize the risk of fire, an approved type of power connector and cable must be fitted. Since different connectors are used in different countries, the safety approval varies. Following is a list of approval marks that are relevant. Do not fit power connectors that are unmarked or from unknown manufacturers.<br>**AVERTISSEMENT:** *Pour minimiser le risque d'incendie, un type approuvé de connecteur d'alimentation et de câble doit être monté. Étant donné que différents connecteurs sont utilisés dans différents pays, l'homologation de sécurité varie. Voici une liste des marques d'approbation qui sont pertinentes. Ne pas installer de connecteurs d'alimentation non marqués ou de fabricants inconnus.* |
|  | **WARNING:** The following procedures are to be done ONLY by trained Rapiscan service technicians: installation, waste disposal, service, dismantling.<br>**AVERTISSEMENT:** *Les procédures suivantes ne doivent être effectuées que par des techniciens de service de Rapiscan formés: installation, élimination des déchets, service, démontage.* |
|  | **WARNING:** When dangerous objects such as explosives, guns or other weapons are identified in the X-ray image, follow the procedure established at your facility to safely resolve such events.<br>**AVERTISSEMENT:** *Lorsque des objets dangereux tels que des explosifs, des armes à feu ou d'autres armes sont identifiés dans l'image radiographique, suivez la procédure établie dans votre établissement pour résoudre ces événements en toute sécurité.* |

| Warning | Definition |
|---|---|
|  | **WARNING:** Modifications to this baggage X-ray inspection system are strictly prohibited. The system owner must contact the manufacturer.<br><br>**AVERTISSEMENT:** *Les modifications apportées à ce système d'inspection par rayons X des bagages sont strictement interdites. Le propriétaire du système doit contacter le fabricant.* |
|  | **CAUTION:** Ensure that the voltage and frequency marked on the plate or label is appropriate with the facility power supply before connecting.<br><br>**Attention:** *Assurez-vous que la tension et la fréquence marquées sur la plaque ou l'étiquette sont appropriées avec l'alimentation de l'installation avant la connexion.* |

## Safety Controls

### Shielding Materials

Shielding materials such as stainless steel, carbon steel, lead sheet, and lead impregnated curtains are used throughout the baggage X-ray inspection machine with the primary purpose of reducing the radiation levels on all external surfaces of the baggage X-ray device to as low as reasonably achievable and below the regulations stray radiation leakage limit of 0.5 milli roentgens/hr (5 uSv/hr) measured at 5 cm from all external surfaces of the cabinet, including the imaginary plane at the access port openings.

### Conveyor Covers/Shrouds

Baggage X-ray inspection systems are equipped with conveyor covers or conveyor shrouds, (ref: Figure 4) that serve as a protective cover to prevent operator and public contact with the moving conveyor system.

In addition, the conveyor cover or shroud provides increased distance from the shielded access port to prevent an individual from reaching into the cabinet and receiving a potential extremity dose from the primary X-ray beam located at or near the center of the cabinet.

Conveyor covers or shrouds must never be removed for convenience during X-ray inspection operations. Removing the covers results in a higher potential for an individual to reach into the cabinet, and it can also cause an increase in general area radiation levels at the access ports and adjacent areas accessible to the public.


**Figure 4: Example of Protective Shroud**

## Safety Interlocks

A safety interlock is a device that prevents the generation of X-ray radiation when radiation shielding components are removed to prevent excessive X-ray radiation exposure to maintenance personnel.

## Warnings, Cautions, and Notes (*Avertissements, mises en garde et remarques*)

All warnings, Cautions, Notes, and instructions in this manual must be read and understood by all personnel operating and maintaining this equipment.

Failure to follow all Warnings, Cautions, Notes, and instructions may result in death or injury to personnel, or damage to equipment. Such failure may also nullify any warranties provided by the manufacturer.

Warnings, Cautions, and Notes are listed and described in Table 2.

*Tous les avertissements, précautions, remarques et instructions de ce manuel doivent être lus et compris par tout le personnel qui exploite et maintient cet équipement.*

*Le non-respect de tous les avertissements, précautions, remarques et instructions peut entraîner la mort ou des blessures au personnel, ou endommager l'équipement. Un tel manquement peut également annuler toute garantie fournie par le fabricant.*

*Les avertissements, les mises en garde et les notes sont répertoriés et décrits dans le tableau 2.*

**Table 2: Warnings, Cautions, and Notes**

Tableau 2: avertissements, mises en garde et remarques

| Alert | Definition |
|---|---|
| WARNING<br>Avertissement | Indicates a hazardous situation that may result in death or injury to personnel.<br><br>*Indique une situation dangereuse qui peut entraîner la mort ou des blessures au personnel.* |
| CAUTION<br>Attention | Indicates a hazardous situation that may result in injury to personnel or damage to equipment.<br><br>*Indique une situation dangereuse qui peut entraîner des blessures au personnel ou endommager l'équipement.* |
| NOTICE<br>Avis | Provides additional information to a description or a procedure.<br><br>*Fournit des informations supplémentaires à une description ou une procédure.* |

## Symbols and Product Labeling

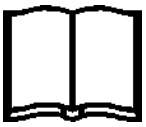
Symbols and Product Labeling are listed and described in Table 3.

**Table 3: Symbols and Product Labeling**

*Tableau 3: symboles et étiquetage des produits*

| Symbol | Definition |
|---|---|
|  | **Radiation:**<br>This symbol indicates that the machine has components that emit X-ray radiation.<br><br>***Rayonnement:***<br>*Ce symbole indique que la machine a des composants qui émettent des rayons X.* |
|  | **Caution, Risk of Danger:**<br>Consult the appropriate manual in all cases where this symbol is used on the machine before operating or maintaining the machine.<br><br>***Attention, risque de danger:***<br>*Consultez le manuel approprié dans tous les cas où ce symbole est utilisé sur la machine avant d'utiliser ou de maintenir la machine.* |

| Symbol | Definition |
|---|---|
|  | **Caution, Risk of Electric Shock:**<br>This symbol indicates that hazardous voltages are present when the machine is energized.<br><br>***Attention, risque de choc électrique:***<br>*Ce symbole indique que des tensions dangereuses sont présentes lorsque la machine est sous tension.* |
|  | **Protective Conductor Terminal:**<br>This symbol indicates a terminal which is bonded to conductive parts of the machine for safety purposes, and is connected to the external protective earthing or grounding.<br><br>***Borne de conducteur de protection:***<br>*Ce symbole indique une borne qui est reliée à des parties conductrices de la machine à des fins de sécurité et qui est connectée à la mise à la terre de protection externe.* |
|  | **Anti-Static:**<br>This symbol indicates that anti-static electricity precautions that should be used to prevent damage from occurring to components on the machine.<br><br>***Anti-statique:***<br>*Ce symbole indique que des précautions d'électricité antistatiques doivent être utilisées pour éviter que des dommages ne se produisent sur les composants de la machine.* |
|  | **Alternating Current (AC):**<br>This symbol indicates a component where alternating electrical current is present when the machine is energized.<br><br>***Courant alternatif (AC):***<br>*Ce symbole indique un composant où le courant électrique alternatif est présent lorsque la machine est sous tension.* |
|  | **Electrical Supply is ON (Energized):**<br>This symbol indicates a component or a position of a component (e.g. a switch) that powers "**ON**" (energizes) an electrical supply to the machine or to a component.<br><br>***L'alimentation électrique est activée (sous tension):***<br>*Ce symbole indique un composant ou une position d'un composant (par ex. un interrupteur) qui alimente "**ON**" (alimente) une alimentation électrique de la machine ou d'un composant.* |

| Symbol | Definition |
|---|---|
|  | **Electrical Supply is OFF (De-Energized):**<br>This symbol indicates a component or a position of a component (e.g., a switch) that powers "**OFF**" (de-energizes) an electrical supply to the machine or to a component.<br><br>***L'alimentation électrique est éteinte (hors tension):***<br>*Ce symbole indique un composant ou une position d'un composant (par exemple, un commutateur) qui alimente "OFF" (dédynamise) une alimentation électrique à la machine ou à un composant.* |
|  | **Lifting Hazard:**<br>This symbol indicates components on the machine that should not be lifted or moved without assistance.<br><br>***Danger de levage:***<br>*Ce symbole indique les composants de la machine qui ne doivent pas être levés ou déplacés sans assistance.* |
|  | **Book Symbol:**<br>This symbol indicates that the applicable manual should be read before operating, maintaining, or installing the machine.<br><br>***Symbole du livre:***<br>*Ce symbole indique que le manuel applicable doit être lu avant l'utilisation, la maintenance ou l'installation de la machine.* |
|  | **CE Mark:**<br>The CE mark is the official marking required by the European Community for all Electric and Electronic equipment that will be sold, or put into service for the first time, anywhere in the European community.<br><br>***CE Marque:***<br>*La marque CE est le marquage officiel exigé par la Communauté européenne pour tous les équipements électriques et électroniques qui seront vendus, ou mis en service pour la première fois, n'importe où dans la Communauté européenne* |
|  | **X-ray Radiation Symbol (Canada Only - Required):**<br>This symbol indicates the unit has components capable of emitting X-radiation.<br><br>***Symbole de rayonnement radiographique (Canada seulement-requis):***<br>*Ce symbole indique que l'appareil possède des composants capables d'émettre des rayonnements X.* |

## Radiation Protection Requirements for Safe Use

As the manufacturer of non-medical cabinet X-ray inspection equipment, in part, Rapiscan Systems Inc. must comply with the performance standard outlined in the U.S. Food and Drug

Administration (FDA) regulation 21 CFR 1020.40 or other applicable international standards such as IEC 61010-2-091 (Edition 1.0 2012-06), Health Canada's Radiation Emitting Devices (RED) Act regulations and/or specific countries' performance standards. Where no regulatory standard exist, Rapiscan Systems Inc. shall certify the non-medical cabinet X-ray system meets or exceeds the stringent performance standards of the U.S. FDA regulation 21 CFR 1020.40 and IEC 61010-2-091 (Edition 1.0 2012-06).

For all radiation emitting devices like the non-medical cabinet X-ray inspection machine located at the owner's facility or installation, the facility owner is responsible for any and all licensing or registration requirements. It is not the responsibility of the manufacturer, distributor, installer, or sales representative to obtain any required license or registration applicable to a specific country or region.

If you have any further questions or concerns, please refer to APPENDIX *E* for assistance.

### Film Safe

Rapiscan X-ray systems are film safe. Film is not affected even after 5 exposures to X-rays.

### Drugs and Food

There are no known adverse effects of radiation absorbed dose to food or pharmaceuticals which are inspected by a baggage X-ray inspection system used for security screening. The radiation absorbed dose received by objects scanned by most systems, including the Rapiscan Systems baggage X-ray inspection system, is 1 millirad or less.

### Noise Emission

Weighted sound pressure emissions from the system do not exceed 75 dBA.

# WARRANTY INFORMATION

## No Warranties

The provision of this publication creates no express or implied warranties of any kind, including, without limitation, any warranties with respect to the accuracy, applicability, completeness or fitness of this publication for any particular purpose.

## Limitation on Liability and Warranty

Rapiscan Systems will not accept liability for damage to equipment or personal injury caused directly or indirectly by either incorrect or poor-quality termination of the local main power supply or power cables. In addition, Rapiscan Systems is not responsible for damage to equipment or personal injury caused by unauthorized modification, maintenance, operation, or tampering with this equipment.

Service of Rapiscan machines shall be performed only by Rapiscan Systems authorized service personnel. Any modification/alteration made to the system after purchase, by the customers or their agents without written authorization from Rapiscan Systems Management will void any warranty issued to the customer. Additionally, Rapiscan Systems is not liable for any damage that might be caused by any unapproved changes.

Rapiscan Systems is an ISO9001:2008 compliant company and adheres to the guidelines for inspection and testing of all materials prior to assembly. Rapiscan machines meet stringent quality control and testing criteria at both the component and system level.

Rapiscan Systems maintains sales and service offices worldwide. For questions or assistance with any Rapiscan Systems product, contact one of the offices provided in APPENDIX E.

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# 1. INTRODUCTION

A baggage type cabinet X-ray inspection system is designed to generate X-rays in the low-to-medium keV energy region (50-200 keV) for use in security screening operations. A cabinet X-ray inspection system means the X-ray source (i.e., X-ray tube, X-ray generator, X-ray tank) is installed inside an enclosure or cabinet which, independent of existing architectural structures (except the floor on which it may be placed), is intended to contain at least that portion of a material being inspected, provide radiation attenuation, and exclude personnel from the cabinet interior during the generation of X-ray radiation.

Baggage type cabinet X-ray inspection systems are regulated by applicable federal and state laws. These systems are equipped with warning lights, warning labels, safety controls, safety interlocks, emergency stops (E-Stops), and shielding materials that must be maintained, inspected, and tested routinely.

Only trained and qualified personnel may operate this X-ray radiation emitting machine. Personnel operating this X-ray machine must ensure the X-ray machine is maintained in excellent condition, that all operators and individual members of the public adhere to and obey all warning labels, and that all safety features are maintained operational.

This publication provides safety precautions, basic radiation safety information and operational procedures necessary to safely operate the system and to ensure the risk associated with radiation emitted by the baggage type cabinet X-ray inspection system is maintained below regulatory limits and remains As Low as Reasonably Achievable (ALARA).

The 9xx series machines utilize a new, state of the art, image acquisition engine which results in enhanced image quality. To take maximum advantage of the new technology, the overall system electronics architecture has been redesigned, resulting in enhanced image quality, improved system reliability, and reductions of maintenance costs.

## 1.1 Purpose

The purpose of this operator's manual is to provide descriptions and operating procedures for the Rapiscan 9xx machine model security X-ray machines. It includes descriptions of the controls and indicators, operating procedures as well as maintenance and troubleshooting tips. Appendices provide additional details including machine startup procedures, regulatory standards, and contact information.

## 1.2 Scope

The scope of this manual is limited to descriptions and procedures described herein.

Rapiscan ensures that the information contained in this manual is accurate as of the date of publication. However, the purchased product may contain options, upgrades, or modifications not covered by this publication.

If there are any questions about the content of this manual or the product that has been purchased, please contact one of the Rapiscan Service Departments listed in APPENDIX E.

## 1.3 Export Controls

The commodity referenced in this publication is subject to export control laws of the United States. The exports, re-export, sale, lease, loan, or transfer, directly or indirectly of any Rapiscan product in or outside the United States to a U.S. embargoed country is prohibited without authorization from the U.S. Government.

## 1.4 Approval for Use

Radiation emitting devices are regulated machines which may require regulatory licensing or registration. It is the system's owner responsibility to determine and/or obtain any required licensing or registration through the applicable protection regulatory authority.

## 1.5 System Owner

After the cabinet X-ray machine is installed by the qualified service provider(s), tested against applicable regulations/standards, and accepted by the customer, the responsibility for the radiation safety of the system, operators, and the general public rests with the owner. The system owner shall designate person(s) responsible for ensuring compliance with the requirements of the applicable regulatory radiation control agency requirements.

All cabinet X-ray system owners or designees are responsible for:

- The designated facility Radiation Safety Officer, trained maintenance worker, or senior operator shall be made available at the X-ray inspection system to assist or carry out operational and maintenance system functions unfamiliar to the radiation inspector during a radiation protection survey. A copy of the most recent radiation survey report specific to that system, including summaries of corrected measures recommended and instituted, shall be made available to the radiation inspector,
- Ensuring that the baggage X-ray inspection system is positioned for its intended use,
- Ensuring that the system is positioned in a location for its intended use,
- Not removing, changing and/or modifying any parts on the cabinet X-ray inspection systems, including the safety warning labels without an approval from Rapiscan Systems, to ensure the system is operated safely and remains compliant with regulations and standards,
- Ensuring that all operators and maintenance personnel has received training on the proper operation and radiation hazards relevant to the installed system prior to using the system,
- Ensuring that the personnel training program conforms to the requirements contained in the applicable regulatory radiation control agency requirements,
- Proficiency in the form of a written and/or practical exam should be demonstrated at the conclusion of training. Refresher training should be provided periodically,
- Documentation of this training shall be maintained at the facility for regulatory radiation control agency review during routine compliance inspection,
- Prescribing radiation safety guidelines, safe operating and emergency procedures, and providing a copy of these guidelines, procedures, and applicable regulatory standards for use and reference by operators and maintenance personnel,

- Establishing a manufacturer's recommended preventative maintenance, inspection and testing program, taking into account the age and frequency of use of the system which ensures all safety devices and components critical to radiation production and shielding are routinely checked and the defective parts are replaced or repaired,
- Ensuring that preventive maintenance should only be performed by qualified service personnel,
- Ensuring that trained maintenance personnel or designated contracted qualified service personnel utilize a properly functioning and appropriately calibrated ionization-chamber or equivalent radiation survey meter to perform radiation measurements,
- Conducting prompt investigations of all radiation incidents, accidents and/or unsafe events, and ensuring the results of this investigation, if applicable, are reported to the appropriate radiation control agency authority and the manufacturer of the system.

## 1.6 System Operator

All cabinet X-ray operators must:

- Receive training, authorized by the system owner or designee, in regard to the operation and radiation safety relevant to the intended use of the system,
- Demonstrate competence to the system owner or designee, operation of the system and a working knowledge of safe operational procedures,
- Secure the operation of the system if any radiation incidents, accidents, and/or unsafe events occur, and immediately notify the system owner or designee if such an event occurs.

## 1.7 General Specifications

**Table 4: General 9xx Model Specifications**

| | 918CX | 920CX | 922CX |
|---|---|---|---|
| System Length | 1,657 mm | 2,082 mm | 2,282 mm |
| System Width | 795 mm | 870 mm | 1059 mm |
| System Height | 1,355 mm | 1,377 mm | 1,488 mm |
| Tunnel Width | 540 mm | 620 mm | 747 mm |
| Tunnel Height | 357 mm | 420 mm | 547 mm |
| Maximum Object Width | 530 mm | 610 mm | 740 mm |
| Maximum Object Height | 350 mm | 410 mm | 540 mm |
| Conveyor Height | 830 mm | 797 mm | 785 mm |
| Maximum Conveyor Load (Evenly distributed) | 165 Kg | 165 Kg | 165 Kg |
| Net Weight | 414 Kg | 537 Kg | 628 Kg |
| Gross Shipping Weight | 505 Kg | 649 Kg | 755Kg |

This data is subject to change.

| | 920DX | 927DX | 928DX |
|---|---|---|---|
| System Length | 2,316 mm | 3,855 mm | 3,643 mm |
| System Width | 1,503 mm | 1,969 mm | 2,029 mm |
| System Height | 1,390 mm | 2,020 mm | 2,111 mm |
| Tunnel Width | 640 mm | 1,010 mm | 1,010 mm |
| Tunnel Height | 430 mm | 1,010 mm | 1,010 mm |
| Maximum Object Width | 630 mm | 1000 mm | 1000 mm |
| Maximum Object Height | 415 mm | 908 mm | 908 mm |
| Conveyor Height | 813 mm | 862 mm | 348 mm |
| Maximum Conveyor Load (Evenly distributed) | 165 Kg | 200 Kg | 200 Kg |
| Net Weight | 897 Kg | 1717 Kg | 1,700 Kg |
| Gross Shipping Weight | 1123 Kg | 2156 Kg | 2200 Kg |

This data is subject to change.

## 1.8 Electrical Rating

**WARNING**

**The machine is designed to function at 230V or 115V ±10% to compensate for variations in supply voltage.**

**WARNING: When dangerous objects such as explosives, guns or other weapons are identified in the X-ray image, follow the established site procedures to safely resolve such events.**

***AVERTISSEMENT: lorsque des objets dangereux tels que des explosifs, des armes à feu ou d'autres armes sont identifiés dans l'image des rayons X, suivez les procédures de site établies pour résoudre en toute sécurité de tels événements.***

**WARNING: Modifications to this baggage X-ray inspection system are strictly prohibited. The system owner must contact the manufacturer.**

***AVERTISSEMENT: Les modifications apportées à ce système d'inspection par rayons X des bagages sont strictement interdites. Le propriétaire du système doit contacter le fabricant.***

**CAUTION: Ensure the voltage and frequency marked on the identification plate or label is appropriate with the facility power supply before connecting.**

***ATTENTION: Assurez-vous que la tension et la fréquence marquées sur la plaque signalétique ou l'étiquette sont appropriées avec l'alimentation de l'installation avant de les raccorder.***

**NOTICE**

**Supply voltage fluctuations are not to exceed ±10% of the nominal voltage.**

**AVIS**

**Les fluctuations de la tension d'alimentation ne doivent pas dépasser ± 10% de la tension nominale.**

Electrical ratings for the 9xx Series Models are listed in Table 5.

**Table 5: Electrical Ratings**

| Item | 918CX, 920CX, 922CX 920DX, 927DX, 928DX | 920CI |
|---|---|---|
| System Power | 100/110/120Vac,15A 200/220/230/240Vac,7.5A 50/60Hz, Single Phase | 120Vac,10A 230Vac,5A 50/60Hz, Single Phase |
| Circuit Breaker Requirements | 15A | 10A |
| Max. Power Consumption | 1500VA | 650VA |
| Voltage Supply | 100/110/120/200/208/220/230/240VAC | 120/230VAC |
| Phase | Single | Single |
| Frequency | 50/60Hz | 50/60Hz |

## 1.9 System Identification Plate

The Rapiscan System has a System Identification Plate located just above the end panel access panel (ref: Figure 5).

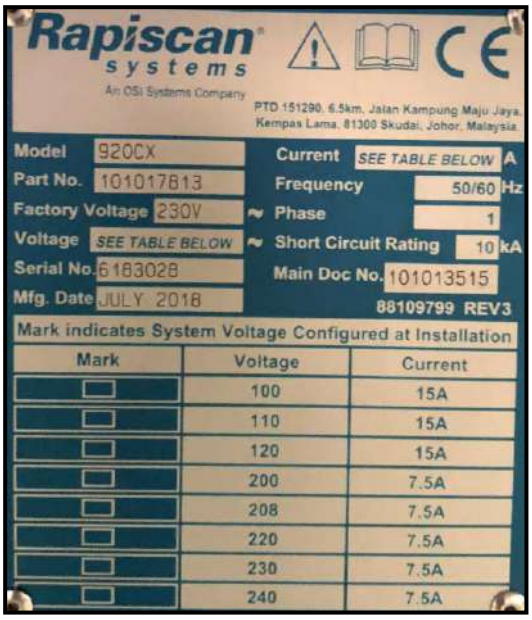


**Figure 5: Example of a System Identification Plate**

## 1.10 Environmental Specifications

Environmental specifications for the 9xx series machines are listed in Table 6.

**Table 6**: Environmental Specifications

| | |
|---|---|
| Altitude | 2000m maximum |
| Operating Temperature | 0ºC to 40ºC |
| Storage Temperature | -20ºC to 50ºC |
| Relative Humidity | 5% to 95 % (Non-condensing) |
| Operation | Indoor use only |
| Overvoltage Category | II |
| Pollution Degree | 2 |
| System Noise (Sound Pressure Level) | max. 75dB(A) |

## 1.11 Acronyms, Terms and Definitions

Acronyms and Definitions are listed in Table 7 and Terms and Definitions are listed in Table 8.

**Table 7: Acronyms and Definitions**

| Acronym | Definition |
|---|---|
| AC | Alternating Current |
| ALARA | As Low As Reasonable Achievable |
| BPI | Baggage and Parcel Inspection |
| CFR | Code of Federal Regulations |
| DTA | Density Threat Alert |
| ECD | European Council Directive |
| FDA | Food and Drug Administration |
| FD&C Act | Food, Drug, and Cosmetic Act |
| IEC | International Eletrotechnical Commission |
| MCB | Main Circuit Breaker Panel |
| NAR | Network Archive Review |
| NarcScan | Narcotic Detection System |
| NDS | Network Display Station |
| OTK | Operator Test Kit |
| OCP | Operator Control Panel |
| OTP | Operator Training Program |
| RED | Radiation Emitting Devices |
| TIP | Threat Image Projection |
| UPS | Uninterruptable Power Supply |
| VC | Variable Color |
| VCon | Variable Contrast |

**Table 8: Terms and Definitions**

| Term | Definition |
|---|---|
| Access Panel | Any barrier or panel which is designed to be removed or opened for maintenance or service purposes, requires tools to open, and permits access to the interior of the cabinet. Any barrier that is designed to be moveable or opened for routine operation is a door (defined below), not an access panel.<br><br>Some cabinet X-ray systems have cosmetic covers that conceal electronics but do not allow access to the cabinet when opened. These covers are not access panels unless they are used to prevent access to interior system components that do allow access to the cabinet. Tools can be keys or common tools such as screwdrivers and wrenches. |
| Aperture | Any opening in the outside surface of the cabinet, other than a port, which remains open during generation of x radiation. Apertures are usually holes for routing cables, ventilation, or wiring into or out of the cabinet. |

| Term | Definition |
|---|---|
| Cabinet | The enclosure that contains an X-ray tube and is intended to contain at least that portion of a material being irradiated, provide radiation attenuation, and exclude personnel from its interior during generation of x radiation. The cabinet is the only space within a cabinet X-ray system where radiation exposure greater than the emission limit is permitted. |
| Door | Any barrier which is designed to be movable or opened for routine operation purposes, does not generally require tools to open, and permits access to the interior of the cabinet. Inflexible hardware rigidly affixed to the door shall be considered part of the door. If the barrier is only opened for maintenance and service, then it is an access panel as defined above. However, if the barrier must be moved for the material being irradiated to be placed in or removed from the cabinet as part of routine operations, then the barrier is a door, even if tools are needed. |
| External Surface | The outside surface of the cabinet X-ray system, including the high-voltage generator, doors, access panels, latches, control knobs, and other permanently mounted hardware, and including the plane across any aperture or port. |
| Floor | The underside external surface of the cabinet. |
| Ground Fault | An accidental electrical grounding of an electrical conductor. |
| Port | Any opening in the outside surface of the cabinet which is designed to remain open during generation of X-rays for the purpose of conveying material to be irradiated into and out of the cabinet, or for partial insertion for irradiation of an object whose dimensions do not permit complete insertion into the cabinet. |
| Primary Beam | The collimated radiation emitted from the X-ray generator. |
| Safety Interlock | A device that is intended to prevent the generation of X-ray radiation when access by any part of the human body comes into contact with the interior of the cabinet X-ray system through a door or access panel. |
| X-ray Tube | Any electron tube which is designed for the conversion of electrical energy into X-ray energy. |

# 2. REFERENCE DOCUMENTS

Reference documents are listed in Table 9.

**Table 9: Reference Documents**

| Document Number and/or Reference Number | Title and/or Description |
|---|---|
| 101013516 | Manual, Maintenance, 9xx Series |
| 101013521 | Startup Guide, 9xx Series |
| 101017173 | Manual, Service, 9xx Series |
| IEC 61010-2-091 | Safety requirements for electrical equipment for measurement, control and laboratory use - Part 2-091: Particular requirements for cabinet X-ray systems |
| 21 U.S.C. 360hh-360ss | Federal Food, Drug, and Cosmetic Act (FD&C Act), including radiation performance standards |
| 21 CFR 1020.40 | Federal Radiation Safety Performance Standard for Cabinet X-ray Systems (Performance Standard) |
| 2006/42/EC | Machinery: European Council Directive |
| 2014/30/EU | EMC: European Council Directive |
| 2014/35/EU | Low Voltage: European Council Directive |
| 96/29/EURATOM | Ionizing Radiation: European Council Directive |

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# 3. CONTROLS AND INDICATORS

## 3.1 System Components

The 900 Series Security X-ray System consists of the following components:

### 3.1.1 Scanner

- X-ray Generator
- Detector System (Diode Array)
- Frame and Tunnel Assembly
- Leaded Curtains
- Conveyor Assembly
- Position Sensors to detect the presence of baggage in the system
- Power Distribution System
- Signal Distribution System
- Onboard Computer

### 3.1.2 Workstation

- Operator Control Panel (**OCP**)
- One high resolution, flat screen monitor
- Lockable Workstation Desk

### 3.1.3 Software

Proprietary Rapiscan Systems ScanOS software controls the entire system and allows the operator to view images in various modes, enhancing the operator's detection capabilities.

### 3.1.4 General

The **OCP** uses high reliability switches, has a high resistance to liquid spills and can be cleaned easily by wiping with a damp cloth. A printed circuit board inside the **OCP** panel contains a micro controller that communicates with the X-ray system computer.

**Note: The Operator Control Panel does not support multiple simultaneous key presses.**

***Remarque: le panneau de commande de l'opérateur ne prend pas en charge plusieurs presses à clés simultanées.***

## 3.2 Operator Control Panel (OCP)

The **OCP** is shown in Figure 6 and the controls, buttons, button functions, and brief descriptions

are described in Table 10.

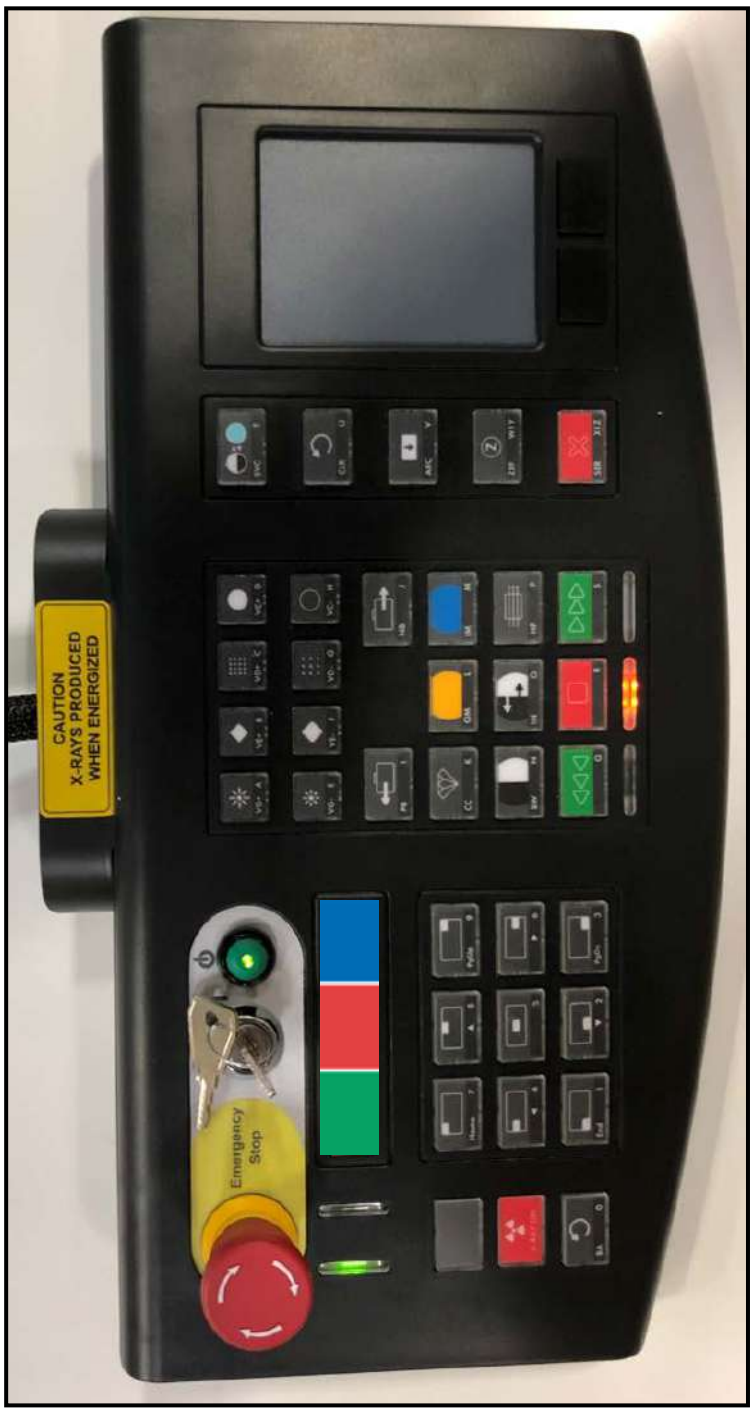
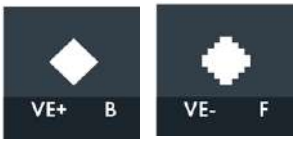


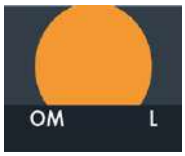

**Figure 6: OCP**

**Table 10: OCP Controls, Buttons, Button Function, and Brief Description**

| Button | Name of Function | Brief Description |
|---|---|---|
|  | **Emergency Stop Key Switch**<br>**Start Button** | **Emergency Stop (E-Stop):** Immediately stops X-ray generation and Conveyor Belt movement.<br>**Power On/Off Key Switch:** Rotating the Key Switch Clockwise (to the right) and pressing the green button turns the system on.<br>**Power On Indicator:** The green button to the right of the key switch illuminates to indicate that the system has been powered on. |

| Button | Name of Function | Brief Description |
|---|---|---|
|  | **Programmable Function Buttons** | Each button can be assigned an image processing function or functions based on the functions used most often, and can be programmed to perform multiple functions. However, functions (such as Variable Gamma (**VG**) and Variable Edge (**VE**) cannot be applied together.<br><br>Some optional feature may require the use of the blue button for other actions. For example, if the NDS feature is enabled, the blue button would indicate 'Toggle' and the button could be used to toggle the visibility of the indicators on or off.<br><br>The assigned functions are visible on the main operation screen. The **Green**, **Red**, and **Blue** boxes representing each button are shown in the lower left corner. The assigned default functions are:<br><br>• **Green:** Crystal Clear (**CC**)<br>• **Red:** High Penetration (**HP**)<br>• **Blue:** Manual Scan (**BW**)<br><br>The programmable function buttons can also be used when entering the **User ID** and **Password** during log in. Their functions are as follows:<br><br>• The **Green** button performs the functions of toggling between **W** and **Y** on the **TR** key, and **X** and **Z** on the **SE** key.<br>• The **Red** button performs the functions of the backspace key.<br>• The **Blue** button performs the functions of the shift key. |

| Button | Name of Function | Brief Description |
|---|---|---|
|  | **Touchpad and Touchpad Buttons** | The touchpad and touchpad buttons operate in a similar fashion as a touchpad and touchpad button of a computer. |
|   | **Variable Gamma (+ and -)** | These buttons alter the brightness of the image. |
|   | **Variable Edge Enhancement (+ and -)** | These buttons show the center of enhancement, which causes objects boundaries to become sharper and easier to see. |
|   | **Variable Density (+ and -)** | These buttons correlate an image's brightness with the scanned object's density. |
|   | **Variable Color Stripping (+ and -)** | These buttons progressively strip away color from an image, allowing the operator to highlight organic material (orange), mixed material (green), or inorganic material (blue). Only users above **Screeners** can assign this setting to either be **Variable Color** (**VC**) or **Variable Contrast** (**VCon**). |

| Button | Name of Function | Brief Description |
|---|---|---|
|  | **Variable Contrast (+ and -)** | **Variable Contrast** will allow enhancements of lighter and darker portion of the image. This is the default setting).<br>Only users above **Screeners** can assign this setting to either be **Variable Color** (**VC**) or **Variable Contrast** (**VCon**). |
|  | **Previous Bag** | This button allows the Operator to go back to a previous bag stored in the buffer. |
|  | **Next Bag** | This button allows an Operator to view the next bag in line stored in the buffer. |
|  | **Crystal Clear** | This button brings out the detail in both light and dark areas simultaneously. |
|  | **Organic Material** | This button toggles between showing all material and showing organic material only. |
|  | **Inorganic Material** | This button toggles between showing all material in the bag and showing inorganic material only. |
|  | **Black and White** | When this button is pressed, all color information from the image is removed. |
|  | **Inverse** | When this button is pressed, the image is displayed in reverse i.e., black becomes white and vice-versa. |

| Button | Name of Function | Brief Description |
|---|---|---|
|  | **High Penetration** | When this button is pressed, the presentation of high-density object is enhanced. |
|  <br>  | **Reverse Button**<br>**Reverse Lamp** | When this button is pressed, the conveyor belt will travel in the reverse direction. Any objects on the belt will reverse through the tunnel, although no X-ray scanning will take place.<br>**Reverse Lamp:** Located beneath the **Reverse** (**Q)** button, this lamp illuminates when the conveyor is traveling in the reverse direction. |
|  <br>  | **Stop Button**<br>**Stop Lamp** | This button will stop the unit from generating X-rays or moving the conveyor belt.<br>**NOTE: If this button is pressed during scanning of an object, the belt will stop then reverse a few centimeters (Back-Belt on Stop configuration). This is to ensure that when Forward (S) is selected; no part of the object is missing from the image. This does not apply if the Back-Belt setting is set to Back-Belt on Forward.**<br>**Stop Lamp:** Located beneath the **Stop** (**R**) button, this lamp illuminates when the conveyor belt is stationary. |
|  <br>  | **Forward Button**<br>**Forward Lamp** | This button moves the conveyor belt forward, allowing X-ray scanning to take place.<br>**Forward Lamp:** Located beneath the **Forward** (**S**) button, this lamp illuminates when the conveyor is traveling in the forward direction. |
|  | **Switch VC** | Switches between **Variable Color (VC)** and **Variable Contrast (VCon)** |

| Button | Name of Function | Brief Description |
|---|---|---|
|  | **Clear** | This button allows the operator to return to **Normal** mode from image enhancement and **Zoom** modes. |
|  | **Archive** | Allows the scanned image to be stored on the computer. The image can be recalled later but only in **Supervisor Mode**. |
|  | **Z Effective** | The **Supervisor** must set the **Zeff Display Type** to **Zeff Range** for **Z Effective** to be active.<br><br>With the **Zeff Display Type** set to **Zeff Range**, clicking the **Z Effective** button on the OCP highlights red pixels representing the **Z Effective Range**. The range of the **Zeff Display** is highlighted at the bottom of the screen. |
|  | **Search** | An Operator, who suspects that there may be a threat or contraband in a particular bag, should press the **SER** button, triggering an Audio Alarm (buzzer), and then follow established site security procedures. |
|  | **X-ray ON** | This button illuminates when X-rays are being produced from the X-ray generator. |
|  | **Back** | This button resets image to normal view (zoom at 1X, no image enhancements). |
|  | **Zoom Key and End** | Each numbered key will zoom into a specific area on the screen. Zoom areas correspond to the white box shown on the key. |

| Button | Name of Function | Brief Description |
|---|---|---|
|  | **Zoom Key** | Each numbered key will zoom into a specific area on the screen. Zoom areas correspond to the white box shown on the key. |
|  | **Zoom Key and Page Down** | Each numbered key will zoom into a specific area on the screen. Zoom areas correspond to the white box shown on the key. |
|  | **Zoom Key** | Each numbered key will zoom into a specific area on the screen. Zoom areas correspond to the white box shown on the key. |
|  | **Zoom Key** | Each numbered key will zoom into a specific area on the screen. Zoom areas correspond to the white box shown on the key. |
|  | **Zoom Key** | Each numbered key will zoom into a specific area on the screen. Zoom areas correspond to the white box shown on the key. |
|  | **Zoom Key and Home Key** | Each numbered key will zoom into a specific area on the screen. Zoom areas correspond to the white box shown on the key. |
|  | **Zoom Key** | Each numbered key will zoom into a specific area on the screen. Zoom areas correspond to the white box shown on the key. |
|  | **Zoom key and Page Up** | Each numbered key will zoom into a specific area on the screen. Zoom areas correspond to the white box shown on the key. |

| Button | Name of Function | Brief Description |
|---|---|---|
| **Menu** | **SINERGY** | **Sinergy** emphasizes the detail in specific regions of images by enhancing the visibility of thin metal, therefore increasing operator recognition of potential threats in cluttered images. |
| **Menu** | **LOW PENETRATION** | **Low Penetration** (**LP**) displays additional details of low-density objects. |
| **Menu** | **PSEUDO COLOR** | **Pseudo Color** exaggerates the difference in objects by showing them in vivid colors, especially shades of yellow and orange vs. purple and dark blue. |

## 3.3 Zoom Key Pad

The zoom option allows the default **Zoom** to be set at a specific level for real-time image enhancement and for image enhancement done while the image is stopped on the screen.

**Zoom Settings:** The **Zoom Settings** menu item is adjustable so that the zoom is set at a certain multiple for real-time image enhancement and for image enhancement done while the image is stopped on screen.

The **Zoom Keypad** is located on the **OCP**, (ref: Figure 6).

### 3.3.1 Fixed Zoom

The **1** through **9** number keys on the **OCP** are used to zoom into different sections of an image.

The screen is divided into nine segments composed of one quarter of the screen. For example, the top left corner of the screen corresponds to **#7** on the Control Panel Numeric Keypad; the center of the screen corresponds to **#5** (ref: Figure 7).

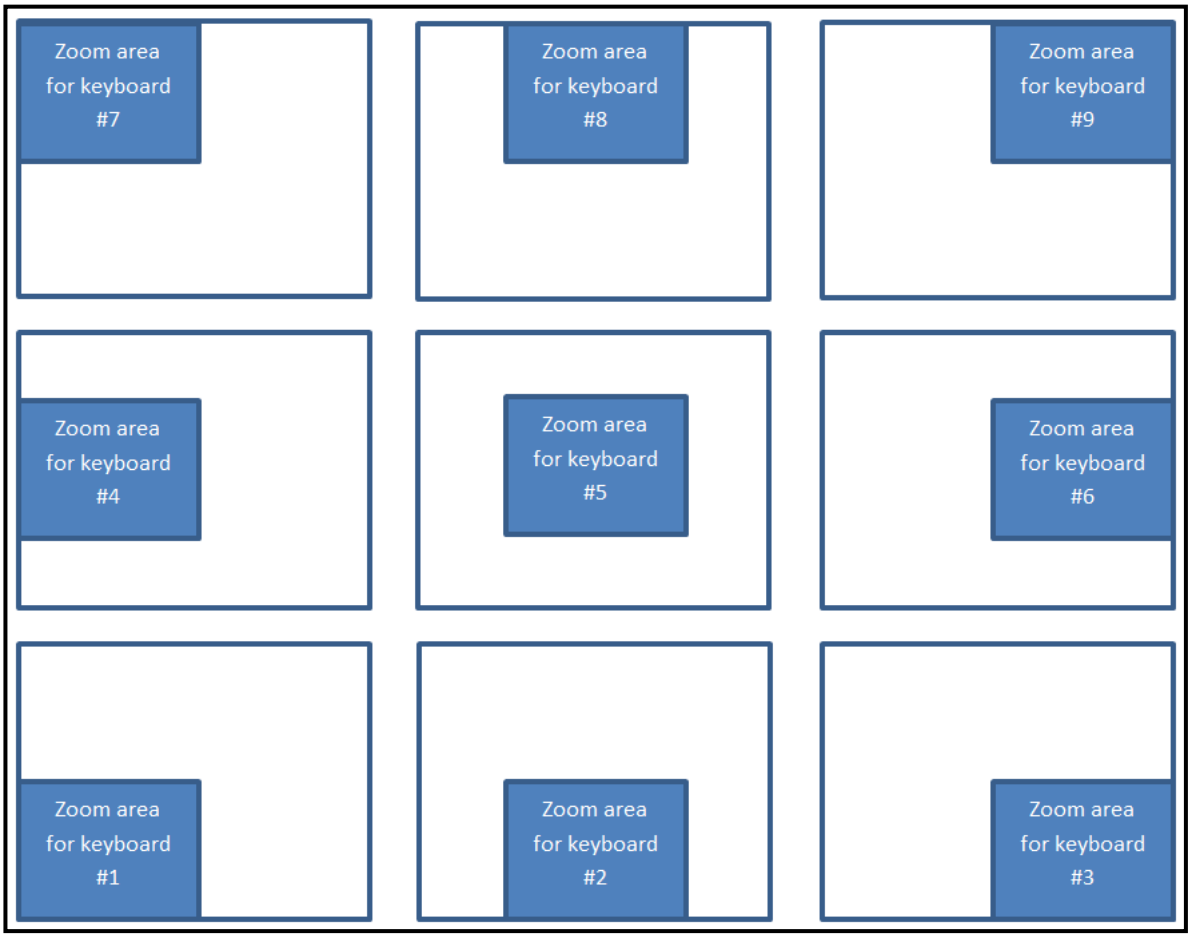



**Figure 7: Keys and Associated Zoom Areas**

Each numbered key will zoom into a specific area on the screen. Figure 7 shows zoom areas corresponding to each key. The grid shown in Figure 7 is for illustration only and will not actually appear on the screen.

By pressing the same button, the operator zooms the same area to a power of **2** with a maximum possible zoom of **64X**.

Pressing the **BA** button (**0** button) returns the image to a normal full size (**1X**).

### 3.3.2 Dynamic Zoom

Dynamic zoom may only work in **STOP** mode (when the image on the screen is not moving).

**To zoom in:** while holding down the right touchpad button, the image on the screen can be moved by sliding the operator's finger in the downward motion on the touchpad.

**To zoom out:** while holding down the right touchpad button, the image on the screen can be moved by sliding the operator's fingers in the upward motion on the touchpad.

Once a zoom has been applied, the image on the screen can be moved by sliding the operator's fingers from right to left on the touchpad.

The zoom settings dialog box shall contain two frames:

### 3.3.3 Fixed Zoom Configurations

#### 3.3.3.1Mode

- **Fixed:**
  - The Zoom can also be set to fixed which means that it will merely zoom into the area shown on the screen.
  - Fixed Zoom simply moves in the direction of the zoom area where the operator choses, regardless if a bag is there or not.
- **Smart:**
  - The Zoom can also be set to smart zoom which compensates for white space by centering on a scanned image rather than on the screen as a whole. In this manner the software attempts to figure out where the bag is and zoom toward that.
  - In smart zoom, the box around the bag contains less white space.
  - Smart Zoom is set as the default method.

#### 3.3.3.2Stopped

- **Disabled:** Disabling the Stopped zoom will automatically disable the real-time zoom.
- **Zoom settings:** 2x,4x,8x,16x,32x,64x. The Stopped zoom can be set to as high as 64x but the bag still needs to be stopped inside the tunnel.

#### 3.3.3.3Real Time

- **Disabled:** If Real-time zoom is set to disabled then the operator cannot zoom while the conveyor is moving and the bag is in the tunnel.
- **Zoom settings 2x:** If Real-Time zoom is set to 2x zoom then the operator can zoom while the bag is going through the tunnel.

### 3.3.4 Dynamic Zoom Configurations:

The operator can:

- Set the Zoom motion to slow/medium/fast,
- Set the Pan motion to slow/medium/fast,
- Can check the 'Invert' boxes.

By changing the zoom settings mode to Fixed and then disabled, the system displays the following message: **Disabling stop mode zoom will also disable real-time zoom. Press the STOP button to continue**.

## 3.4 Key Actuated Control

A key actuated control, (ref: Figure 6) is required to insure X-ray generation is not possible with the key removed. When the baggage or cabinet X-ray inspection machine is not in use, it is recommended the key be removed and maintained by the facility RSO or designee to prevent unauthorized use.

## 3.5 Emergency Stop

There is an Emergency Stop (E-Stop) button located on the OCP, (ref: Figure 6), pushing it will immediately stop the machine from generating X-rays and moving the conveyor belt.

E-Stop buttons are also located at the entrance port and exit port, (ref: Figure 4). An E-Stop event can also originate remotely from the external conveyors when the machine is integrated into customer's Baggage Handling System (BHS).

The following steps detail the operation of an Emergency Stop (E-Stop) Action:

- Initiate E-Stop Action

  If the user becomes aware of any potential danger to persons or equipment, push firmly on the nearest red E-Stop button until it locks in the down position.

  Pushing any E-Stop button immediately cuts off the AC power to the X-ray generator and the drive motors to the main conveyor, bringing the entire system to a complete stop.

  When an E-Stop is activated, the message shown in Figure 8 appears.

**WARNING: Use the E-Stop for emergency situations, such as imminent personal injury or damage to the system. Do not use it as a stop function. Excessive use may damage the system**

***AVERTISSEMENT: utilisez l'E-stop pour des situations d'urgence, telles que des blessures corporelles imminentes ou des dommages au système. Ne l'utilisez pas comme fonction d'arrêt. Une utilisation excessive peut endommager le système***

- Inspect the machine for the cause of the emergency stop function.
- Manually reset an E-Stop after resolving the cause of its activation:
  1. Rotate (do not pull) the red button clockwise in direction of the white arrows.
  2. Release the button, allowing it to pop up.

     If the event that causes the emergency stop was a mechanical or electrical malfunction, a qualified service engineer should examine the machine before it is put back in service.

**WARNING: Do not pull on the E-Stop to reset it. Rotate the button in the direction of the white arrows and then release it. Pulling on the button can cause it to malfunction.**

***AVERTISSEMENT: ne tirez pas sur l'E-stop pour le réinitialiser. Tournez le bouton dans le sens des flèches blanches, puis relâchez-le. Tirer sur le bouton peut provoquer un dysfonctionnement.***

- Resume normal operation:
  After manually resetting the E-Stop button, the operator presses the OCP R button to resume normal operation.

Engaging the E-Stop button immediately stops the unit from generating X-rays and moving the conveyor belt.

When E-Stop is engaged, the message shown in Figure 8 appears.

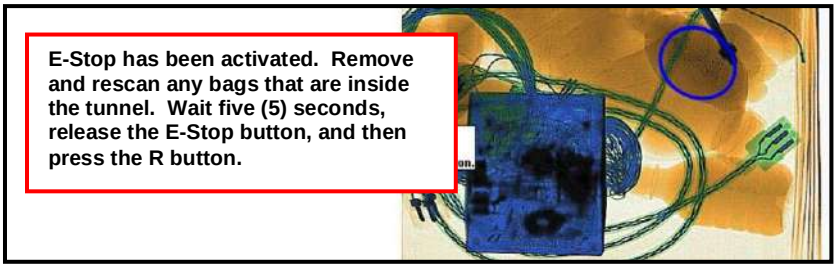



**Figure 8: E-Stop Initial Message**

If the STOP button on the OCP is engaged before the E-Stop is released, the message shown in in Figure 9 appears.

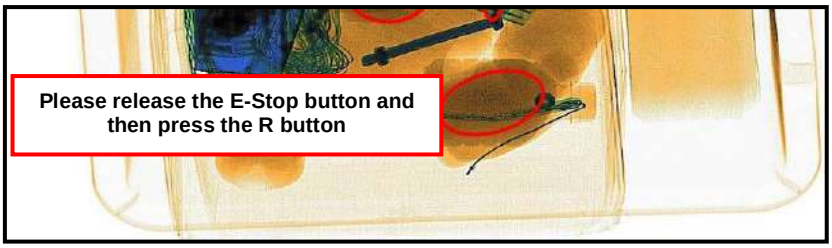



**Figure 9: E-Stop Release Message**

The operator must release the E-Stop by rotating it clockwise and then press the OCP STOP button to resume back to normal operation. The message shown in Figure 10 appears.


**Figure 10: E-Stop Wait for System Message**

## 3.6 End Panel and IEC Socket

**WARNING: Voltage is present in the high speed conveyor terminal, handle with caution.**

**AVERTISSEMENT: la tension est présente dans la borne de convoyeur à grande vitesse, manipulez avec prudence.**

**CAUTION: Do not block this side of the machine. Access is required to plug in the power cable and to access the circuit breaker.**

***ATTENTION: ne bloquez pas ce côté de la machine. L'accès est nécessaire pour brancher le câble d'alimentation et pour accéder au disjoncteur.***

**CAUTION: Do not use the PC Restart/Reset button to turn the computer off. This is only to be used in a situation when the computer has crashed. Pressing this button will cause a reboot of the computer.**

***ATTENTION: n'utilisez pas le bouton redémarrage/réinitialisation du PC pour éteindre l'ordinateur. Ce n'est qu'à utiliser dans une situation où l'ordinateur s'est écrasé. Appuyer sur ce bouton provoquera un redémarrage de l'ordinateur.***

The supply power for the Rapiscan X-ray system enters the machine via **Power Inlet** socket on the **End Panel**, (ref: Figure 11, showing an example of a 9xx connector panel with the access panel removed).

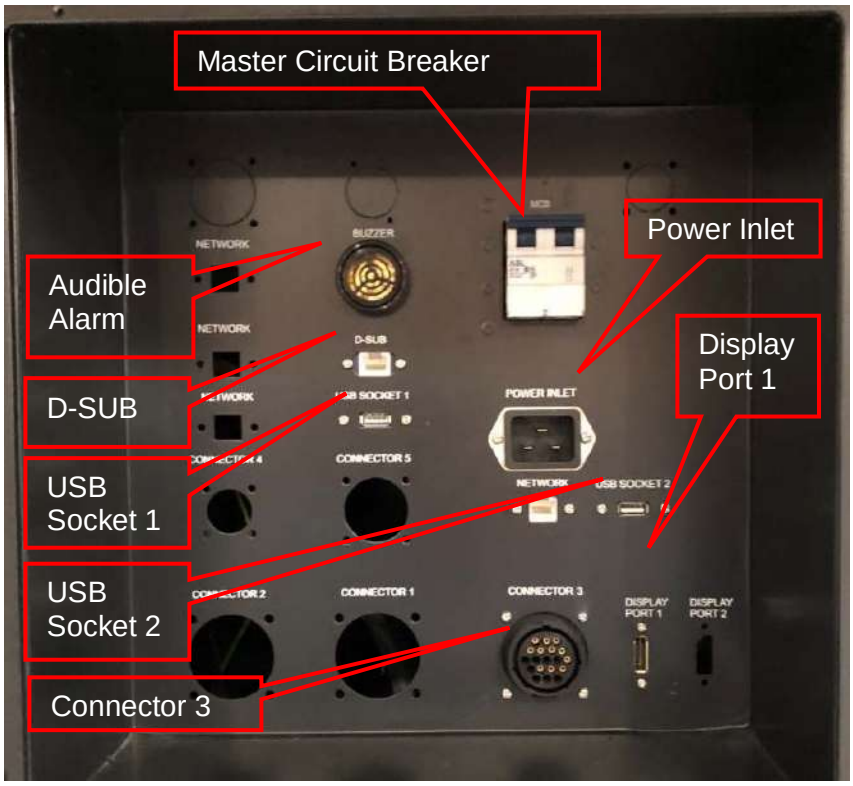



**Figure 11: End Panel**

## 3.7 Material Groups and Image Processing

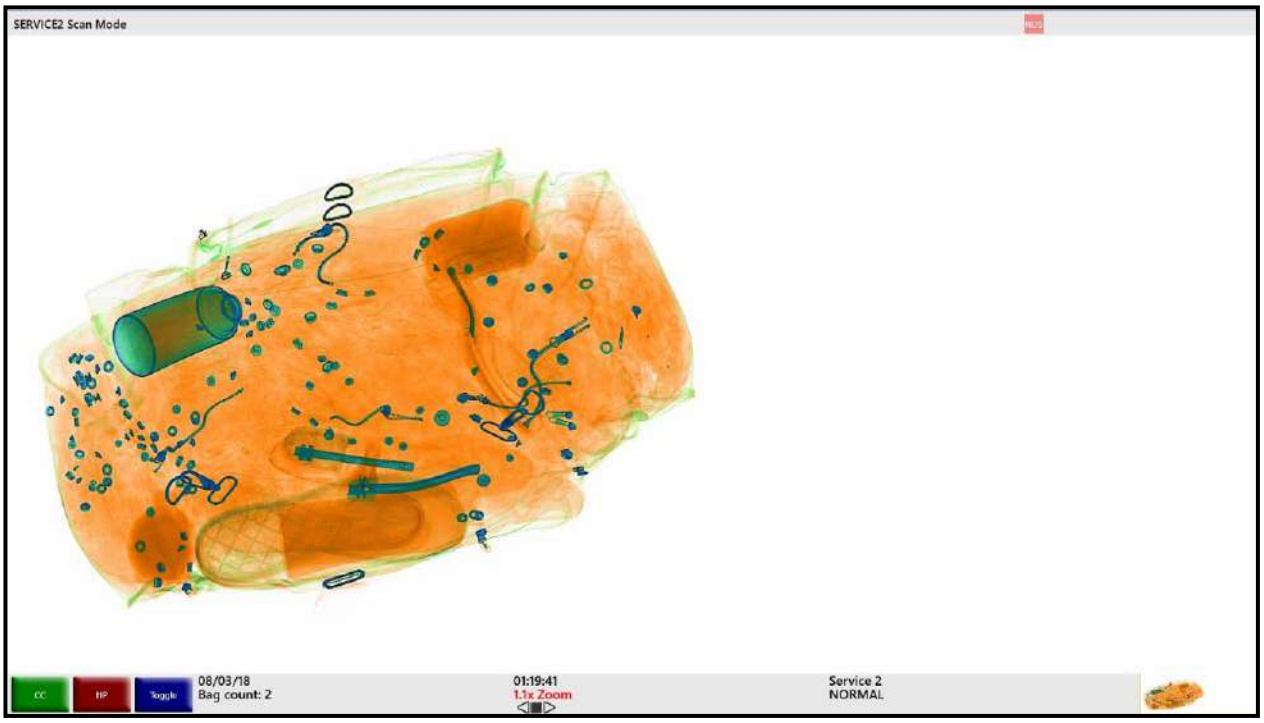



**Figure 12: Rapiscan Spectrm-4**

**Group 1, Organic Substances:** composed of light chemical elements that have an atomic weight of less than ten (irrespective of their molecular structure) are displayed in orange color on the operator's screen. The most important elements in this category are hydrogen, carbon, nitrogen and oxygen.

Most explosives are made of a combination of these elements. Explosives like nitro-glycerin and semtext belong to this group.

Materials such as drugs, paper, wood, water and plastics will also be displayed in orange.

**Group 2, Inorganic Substances and Medium Heavy Elements:** are displayed in green color. Salt and aluminum belong to this group. Overlapping objects of organic and inorganic substances (mixed) will also appear green.

**Group 3, Inorganic Substances Such as Zinc, Tin, Copper, and Steel:** will appear blue during a scan.

Depending on the thickness/density of the scanned material each color can be lighter and darker shades.

If a material is too dense to be penetrated by X-rays, it will appear black.

### 3.7.1 Organic Material (OM) Button


**Highlights Organic Materials Only:** This view mode can identify explosives and narcotics. Operation of the **OM** button has the effect of removing the color information of all groups except for Group 1 (organic), (ref: Figure 13).

**Figure 13: Organic Materials**

### 3.7.2 Inorganic Material (IM) Button


**Highlights Inorganic Materials Only:** In this view mode weapons like knives and guns can be identified. Operation of the **IM** button has the effect of removing the color information of all groups except for Group 3 (inorganic), (ref: Figure 14).

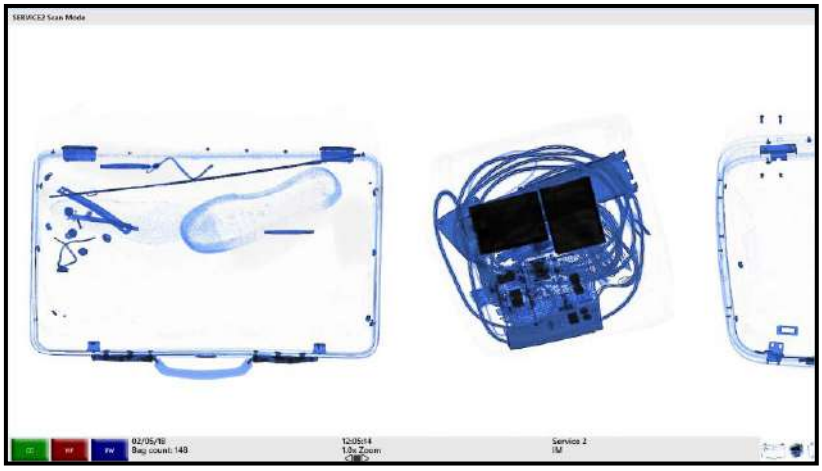


**Figure 14: Inorganic Material**

### 3.7.3 Crystal Clear™ (CC) Button


Automatically adjusts the contrast settings in the image to enhance the exposure of discrete objects that may otherwise appear homogeneous while bringing out the detail in both light and dark areas simultaneously, (ref: Figure 15).

**Figure 15: Crystal Clear™ (CC)**

### 3.7.4 Black and White (BW) Button


Changes the image display from color to gray scale mode where some objects/materials are easier to identify, (ref: Figure 16).

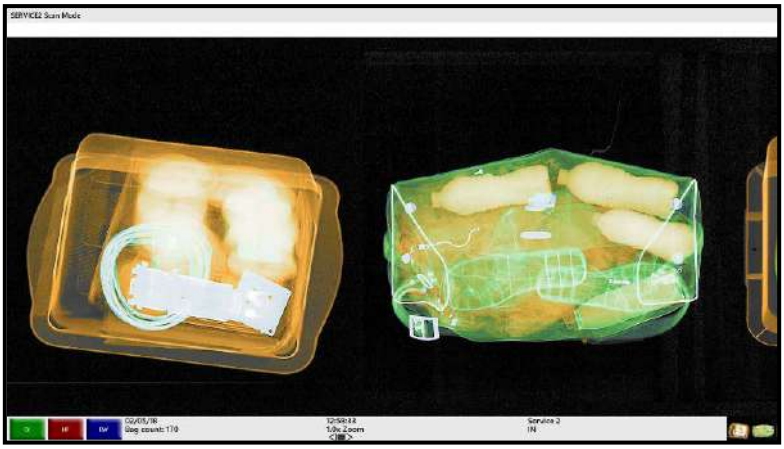


**Figure 16: Black and White (BW)**

### 3.7.5 Inverse (IN) Button


When this button is pressed, the colors on the screen are reversed i.e., black becomes white and vice versa. Thin wires used in explosive devices can be identified in this view mode, (ref: Figure 17).

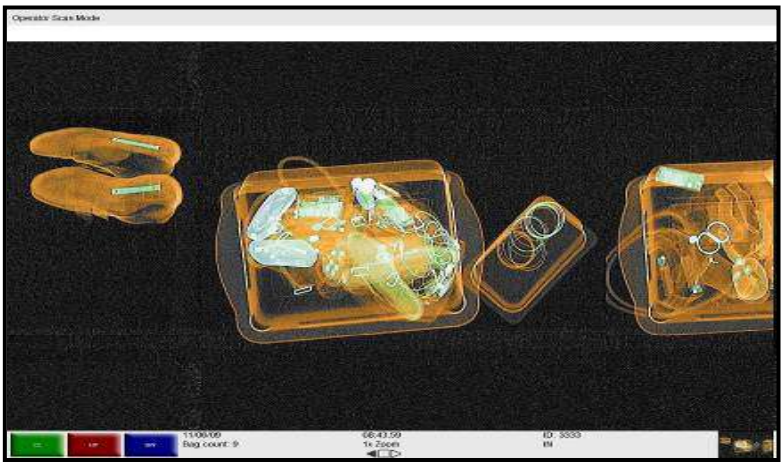


**Figure 17: Inverse (IN)**

### 3.7.6 High Penetration (HP) Button


When this button is pressed, the presentation of high-density objects is enhanced, (ref: Figure 18).

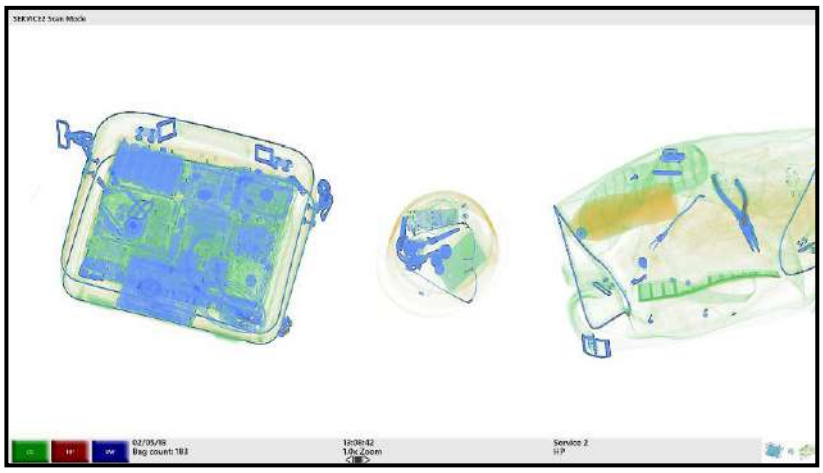


**Figure 18: High Penetration (HP)**

### 3.7.7 Variable Gamma (VG) Buttons


The **Variable Gamma** function allows the operator to alter the brightness of the displayed image by pressing the **VG+** and **VG-** buttons.

Multiple keystrokes on the **VG+** or **VG-** buttons will either increase or decrease image brightness, (ref: Figure 19 and Figure 20). Figure 19 shows an image with **VG+** applied. This indicates that the user pressed the **VG+** button several times in order to apply a near-maximum amount of **VG+**. Figure 20, conversely, shows an image with heavy **VG-** applied as indicated by the variable slider. The variable slider is indicated by a red arrow.

**Figure 19: VG+ (Variable Slider)**

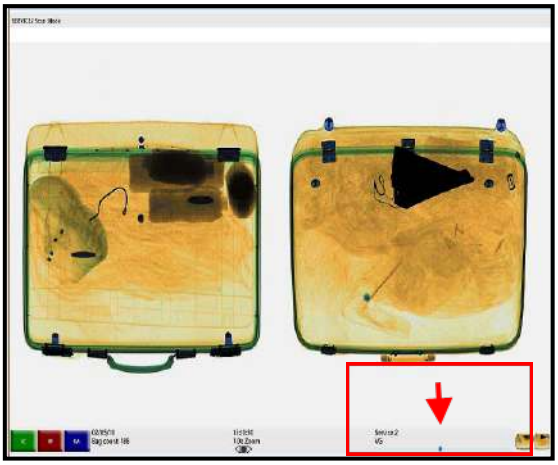


**Figure 20: VG- (Variable Slider)**

### 3.7.8 Variable Edge Enhancement (VE) Buttons


The **Variable Edge Enhancement** buttons (**VE-** and **VE+**) gradually changes the display settings so that the edges of objects become sharper and easier to view.

Multiple keystrokes on the **VE-** or **VE+** buttons will either increase or decrease the sharpness of different boundaries within the objects being scanned. Figure 21 and Figure 22 show images with **VE+** and **VE-** applied. The variable slider is indicated by a red arrow.

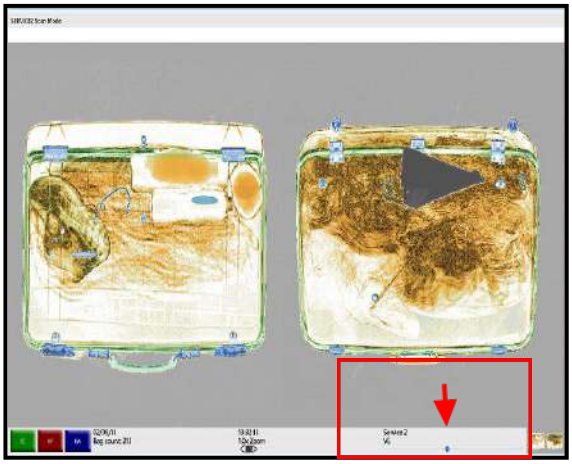


**Figure 21: VE+ (Variable Slider)**

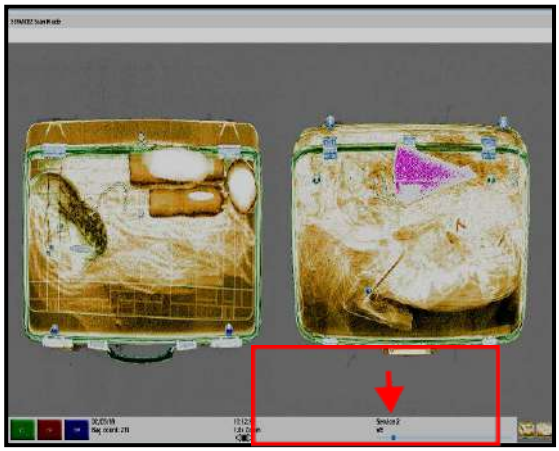


**Figure 22: VE- (Variable Slider)**

### 3.7.9 Variable Density (VD) Buttons


The **q** function allows the operator to exaggerate the difference in display settings between objects that have similar X-ray penetrations and might otherwise not be distinguishable from one another. To adjust this feature, press the **VD+** and **VD-** buttons.


Multiple keystrokes of the **VD+** or **VD-** buttons will either increase or decrease the difference in color brightness. Figure 23 and Figure 24 show images with **VD+** and **VD-** applied. The variable slider is indicated by a red arrow.

**Figure 23: VD+ (Variable Slider)**

**Figure 24: VD- (Variable Slider)**

### 3.7.10 Variable Color Stripping (VC) Buttons

**Note: Only users above Screener level can assign this setting to either be Variable Color (VC) or Variable Contrast (VCon).**


In this mode, highlighted materials will show in their original colors while the rest of the objects display in grayscale. The **VC+** and **VC-** buttons are used to highlight the differences between the material groups.


Multiple keystrokes on the **VC-** or **VC+** buttons will highlight different material groups. Figure 25 and Figure 26 show image with **VC+** and **VC-** applied. The variable slider is indicated by a red arrow.

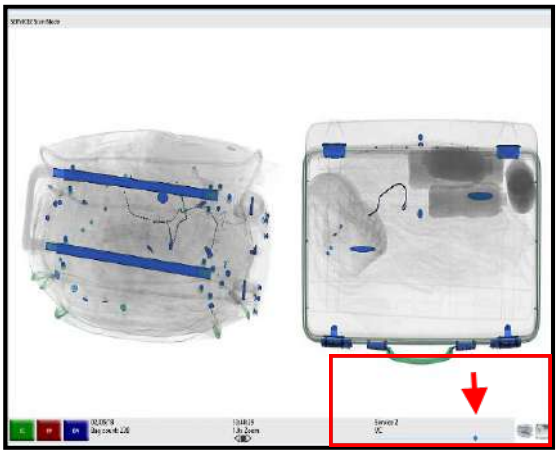


**Figure 25: VC+ (Variable Slider)**

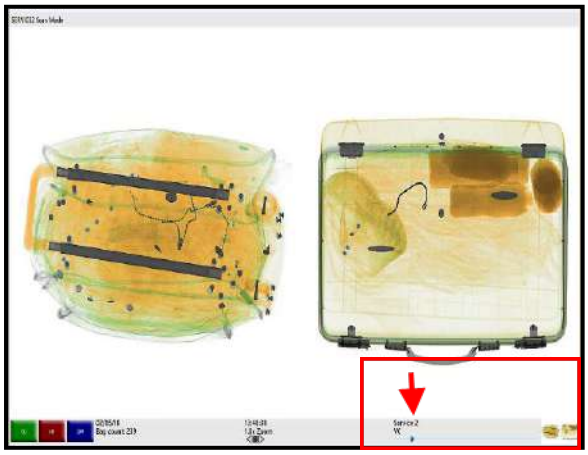


**Figure 26: VC- (Variable Slider)**

### 3.7.11 Variable Contrast (VCon) Buttons


In this mode, highlighted materials will allow enhancement of lighter and darker portion of an image. The image shown in Figure 27 indicates progressive changes as the **VC+** button is pressed.

Only users above Screeners can assign this setting to either be **VC** or **VCon**. The default setting is Variable Contrast. **VCon** can be adjusted from **+1** to **+15**.

**Figure 27: Examples of Variable Contrasts Changing as VC+ is Pressed**

### 3.7.12 Z Effective

Z Effective has two modes: **Zeff Range** and **Interactive**. Either can be selected by accessing the **Zeff Display Type** menu from the **Supervisor Scan Mode**, **Service Scan Mode** or the **Service2 Scan Mode**.

NOTICE

**By default, the system is configured to be set to Zeff Interactive mode. To change to Zeff Range Mode, the Operator (scanner) MUST log out, (ref: Section 4.1.6) of the Screener Scan Mode.**

#### 3.7.12.1 Z Effective Interactive Mode

Selecting **Interactive** from **Zeff Display Type** and pressing the OCP **Z Effective** button allows the user to move the cursor to a point of interest on a displayed image to identify the specific material of that part of the image.

1. Once displayed images are scrolling across the screen, press the OCP **Stop** button on the desired image, and then press the OCP **Z Effective** button.

NOTICE

**In Service2 Scan Mode, Z Effective Interactive displays as one decimal number. In Service Scan Mode and Supervisor Scan Mode, Z Effective Interactive displays as an integer value.**

2. Move the mouse cursor to the point of interest on the displayed image to view the type of material and the associated decimal value. Examples of **Z Effective Interactive** images are shown in Figure 28 through Figure 30.
3. When all desired items have been identified, click either the left or right OCP mouse button to exit **Zeff Display Mode**.

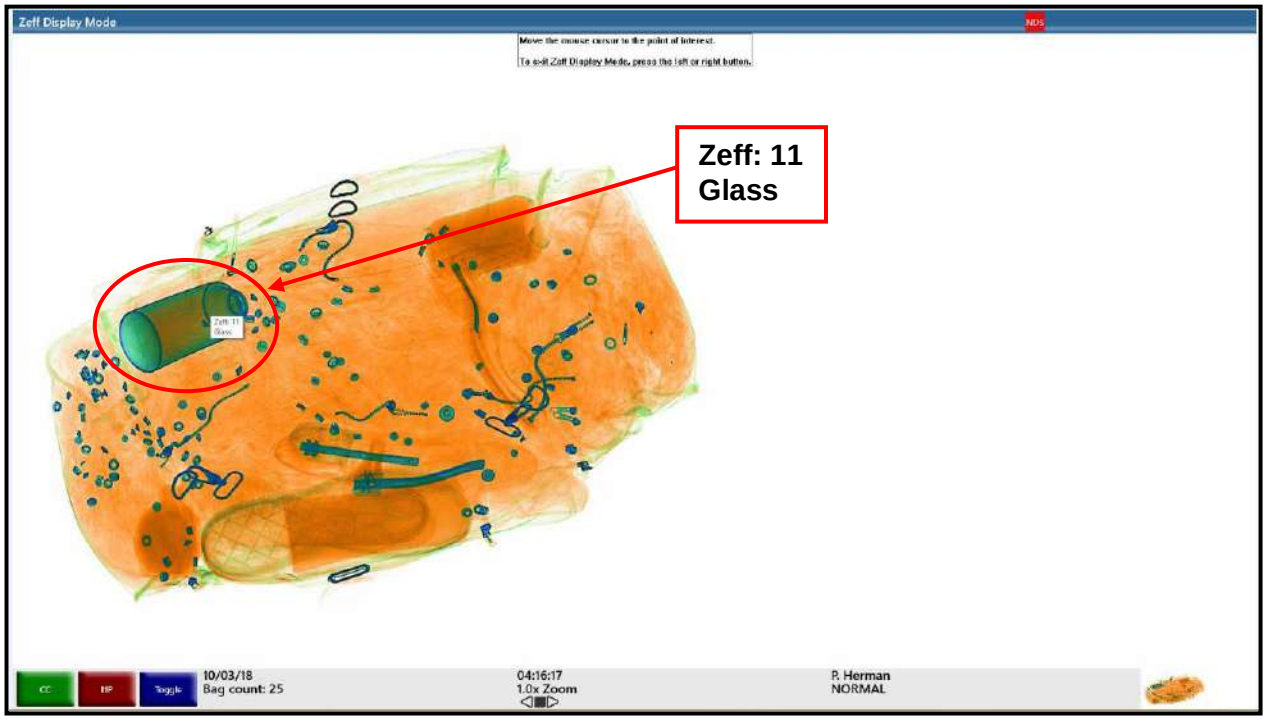



**Figure 28: Example of Z Effective Interactive - Glass**

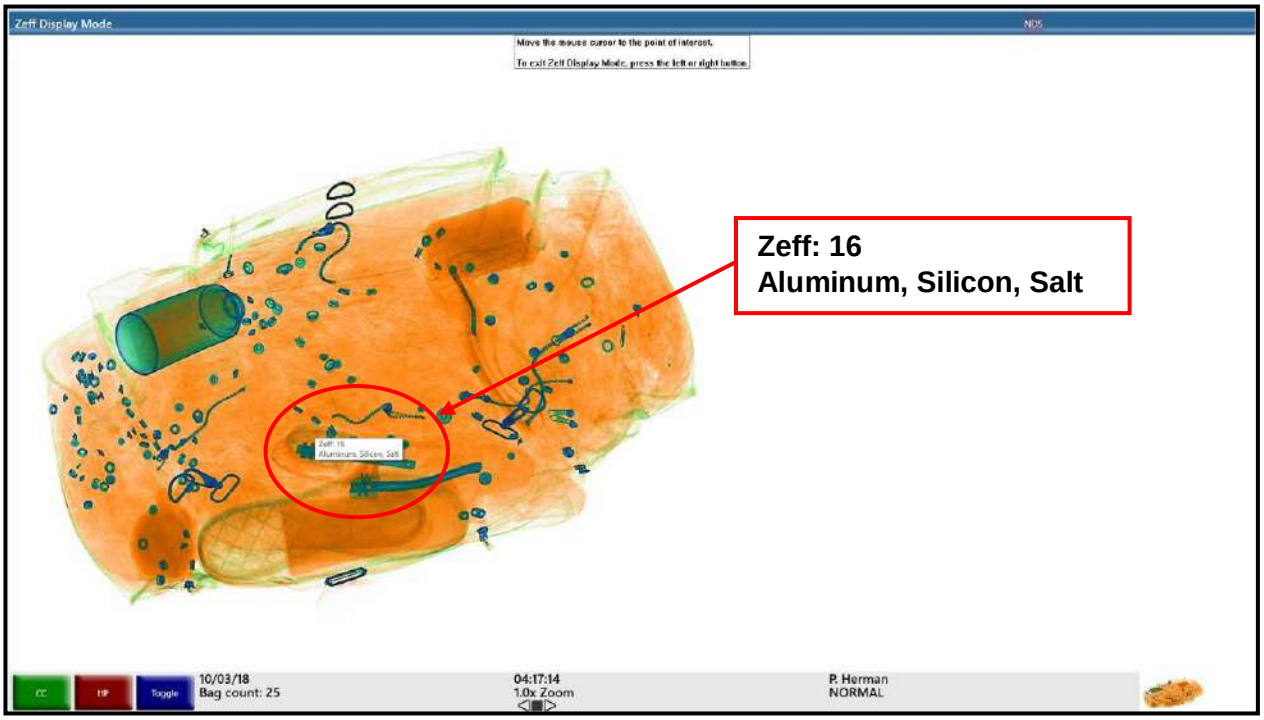



**Figure 29: Example of Z Effective Interactive - Aluminum, Silicon, Salt**

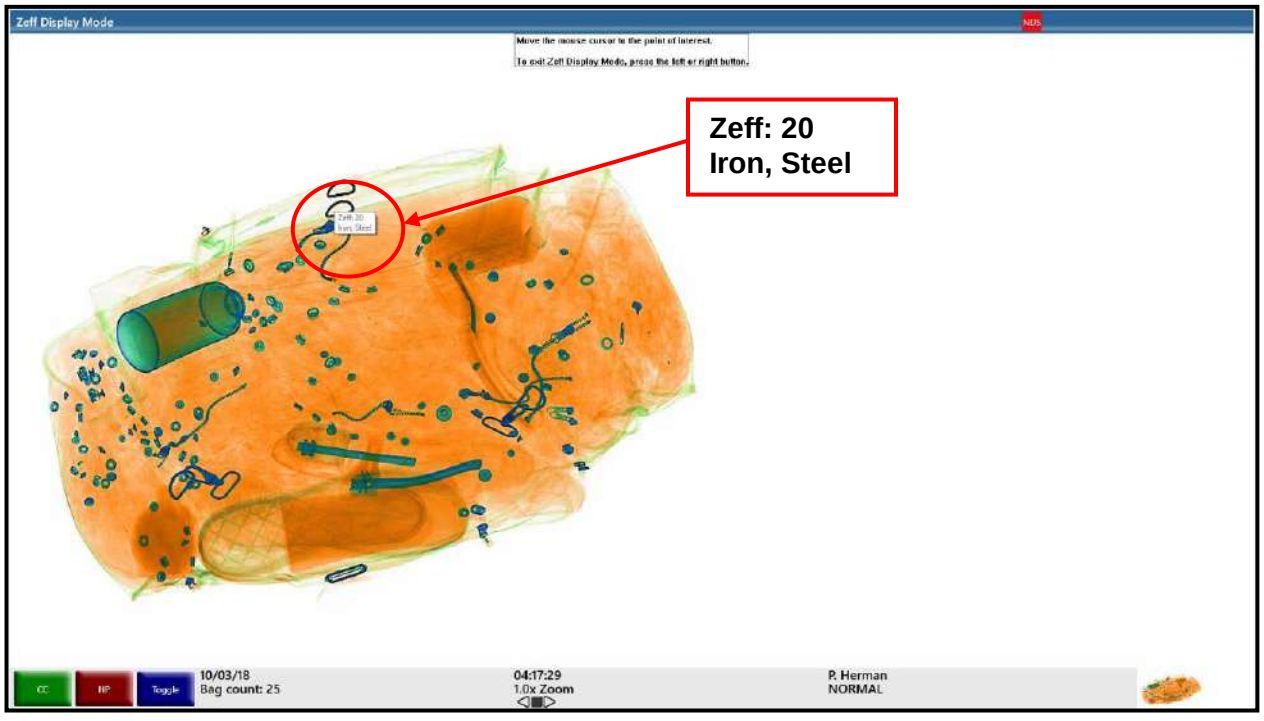



**Figure 30: Example of Z Effective Interactive - Iron, Steel**

### 3.7.12.2 Z Effective Range Mode

1. Once displayed images are scrolling across the screen, press the OCP **Stop** button on the desired image, and then press the OCP **Z Effective** button.
2. With the **Zeff Display Type** set to **Zeff Range**, clicking the **Z Effective** button on the OCP highlights red pixels representing the **Z Effective Range**. The range of the **Zeff Display** is highlighted at the bottom of the screen as shown in Figure 31 through Figure 33.

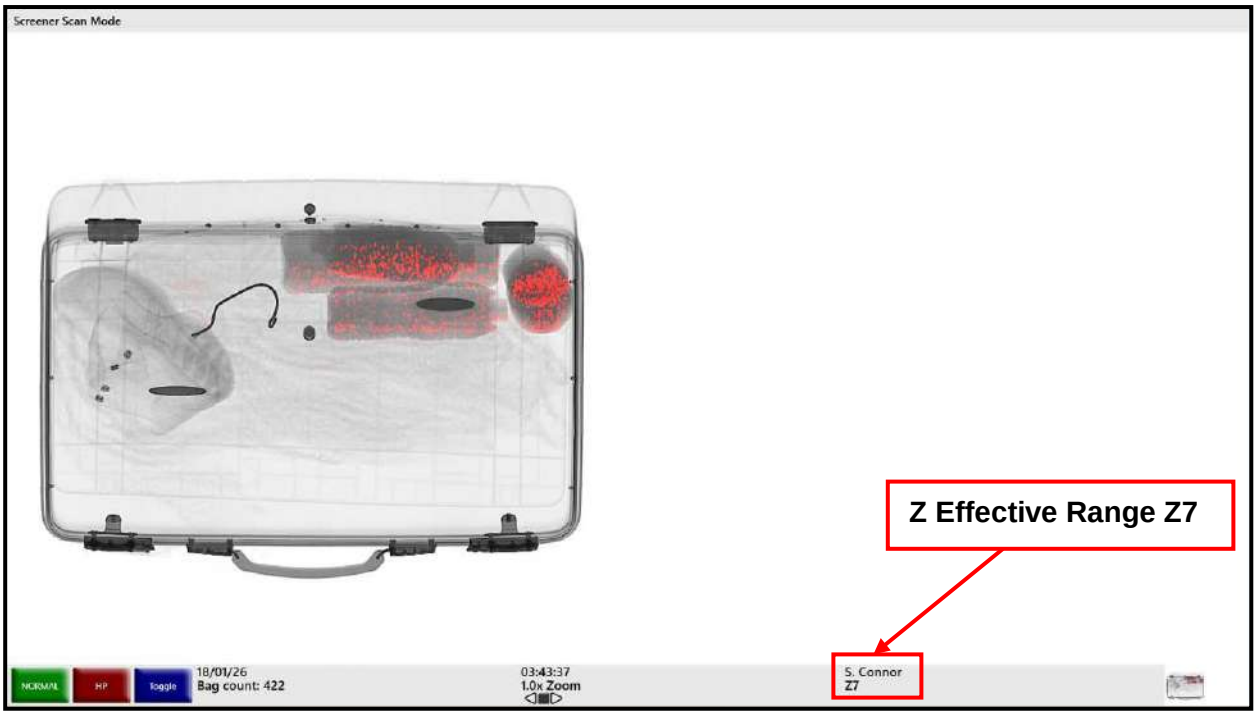



**Figure 31: Example of Zeff Display - Z7**

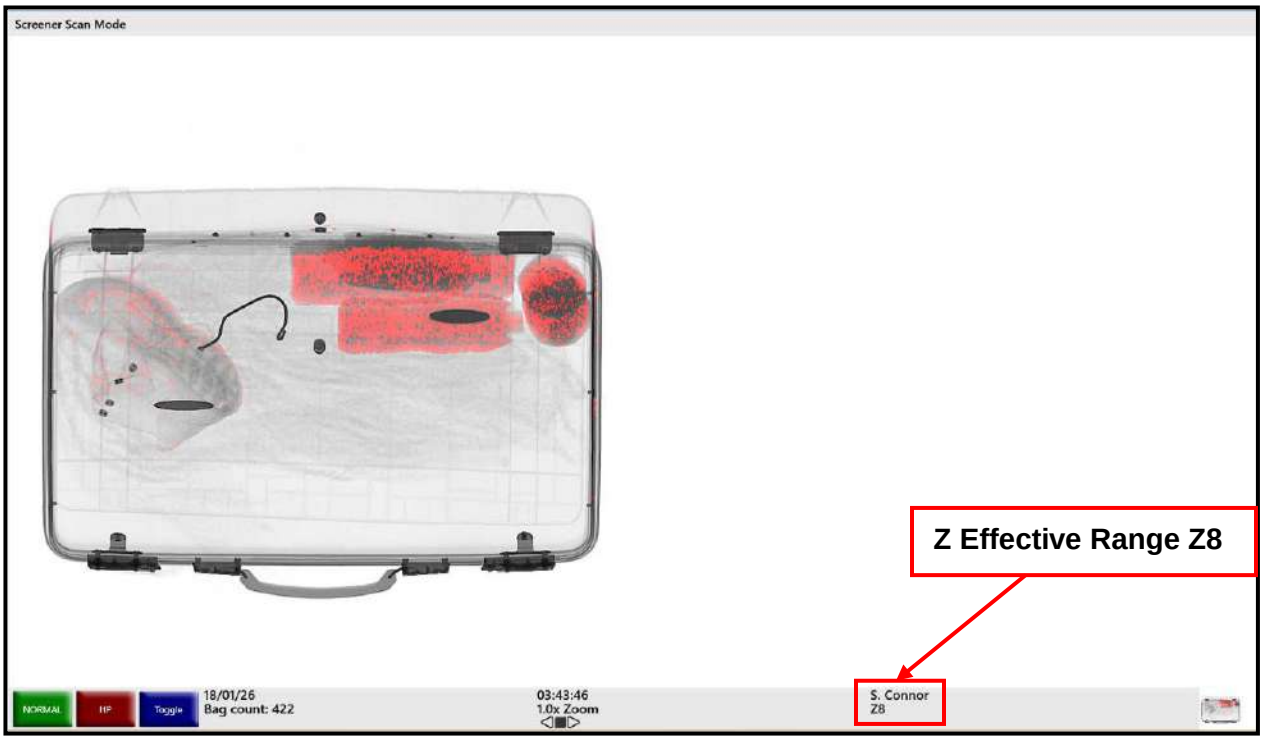



**Figure 32: Example of Zeff Display - Z8**


**Figure 33: Example of Z-Effective Display - Z9**

### 3.7.13 Additional Image Processing Functions

**NOTICE**

In addition to the image processing keys on the **OCP** (ref: Chapter 3), **Toggle SG (SINERGY)**, **Toggle PSC (Pseudo Color)**, and **Toggle LP (Low Penetration)** can be accessed form the **Screener Scan Mode**, (ref: Chapter 5) by clicking **Image Processing** as shown in Figure 34.

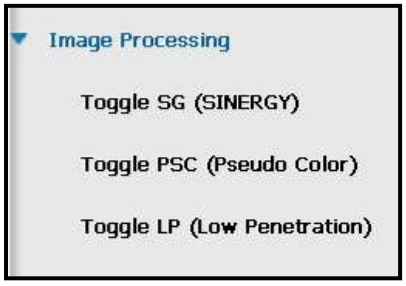



**Figure 34: Image Processing Menu**

### 3.7.13.1 Toggle SG (SINERGY)

1. Left click the **Image Processing Menu**: **Toggle SG (SINERGY)**, **Toggle PSC (Pseudo Color)**, and **Toggle LP (Low Penetration)**, are shown in Figure 34).
2. Clicking **Toggle SG (SINERGY)**, (ref: Figure 34) during a scan emphasizes the detail in specific regions of images by enhancing the visibility of thin metal, therefore increasing operator recognition of potential threats in cluttered images, (ref: Figure 35).

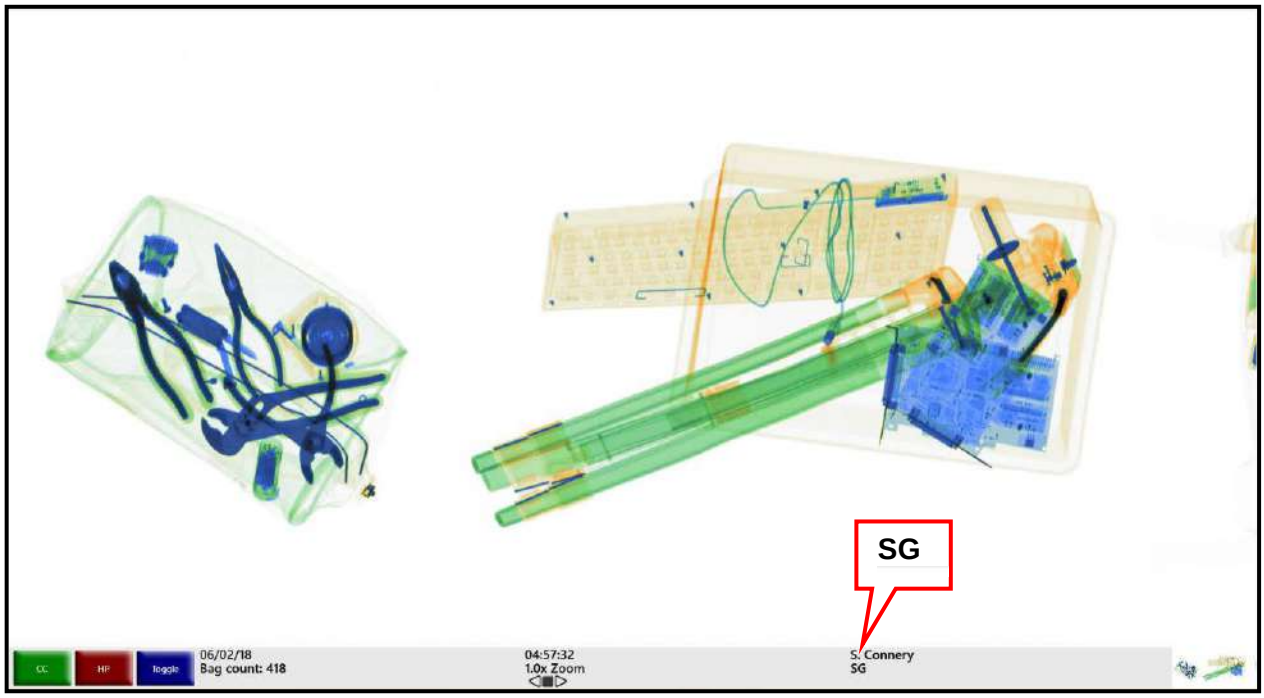



**Figure 35: Example of Toggle SG (SINERGY) Applied During a Scan**

### 3.7.13.2 Toggle PSC (Pseudo Color)

1. Clicking **Toggle PSC (Pseudo Color)**, (ref: Figure 34) during a scan creates artificial colorization of grey levels. It exaggerates the difference in objects by displaying them in vivid colors (e.g., shades of yellow and orange versus purple and dark blue), (ref: Figure 36).

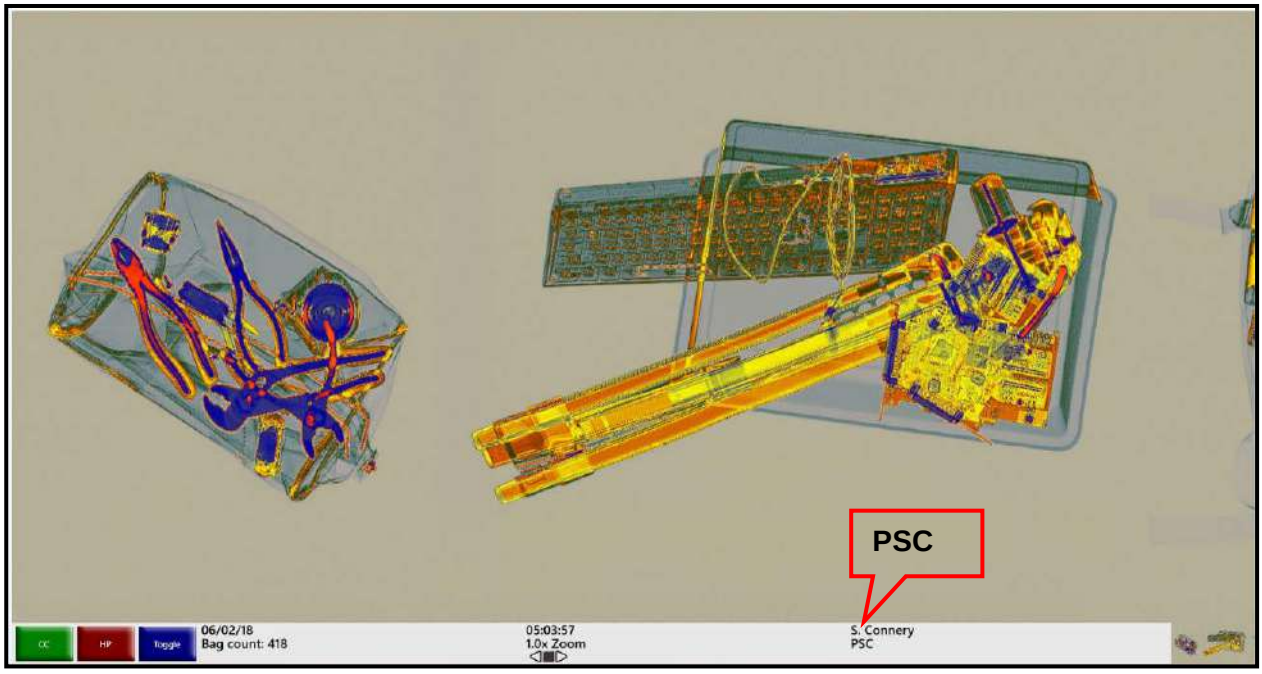



**Figure 36: Example of Toggle PSC (Pseudo Color) Applied During a Scan**

### 3.7.13.3 Toggle LP (Low Penetration)

1. Clicking **Toggle LP (Low Penetration)**, (ref: Figure 34) during a scan displays additional details of low-density objects, (ref: Figure 37).

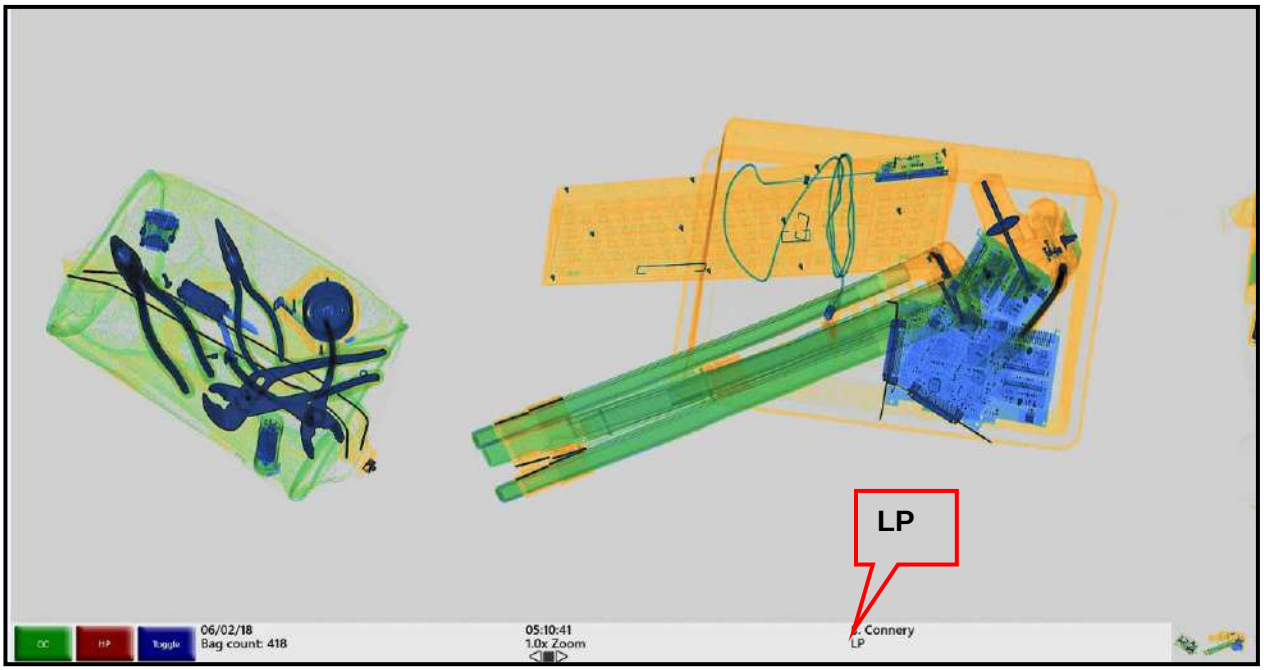



**Figure 37: Example of Toggle LP (Low Penetration) Applied During a Scan**

### 3.7.14 Layered Image Processing

Layered image processing provides the ability to combine various image enhancement features simultaneously. Figure 38 displays an image that is being enhanced with **Crystal Clear™** (**CC**) and **Organic Material** (**OM**).

**Note: Applying too many image enhancements can have the opposite effect and distort the image beyond the operator's ability to identify possible threats.**

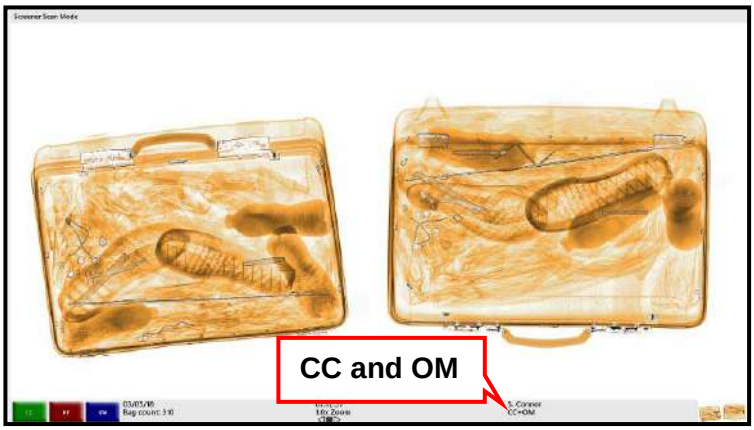



**Figure 38: CC and OM**

### 3.7.15 Real Time Mode

NOTICE

**When an Image processing feature is enabled by a Supervisor there are two (2) modes of operation available; Real Time and Stop.**

When an image is scrolling across the screen (both in forward and reverse mode), the operator can use **CC**, **Black** and **White**, **Inverse**, etc., on the image without having to stop the image.

Figure 39 displays a screen in forward/scanning mode, with **Variable Gamma** (**VG**) enabled.

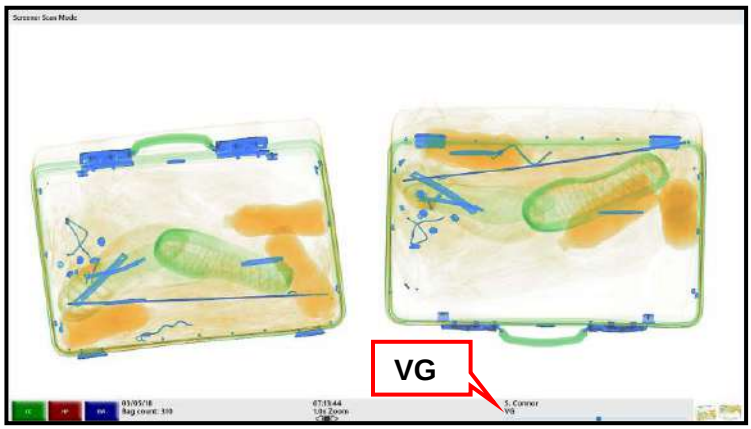



**Figure 39: Scanning Mode with VG Enabled**

### 3.7.16 Stop Mode

NOTICE

**When an Image processing feature is enabled by a Supervisor there are two (2) modes of operation available; Real Time and Stop.**

If **Image Processing Mode** is set to **Stop Mode**, the operator must press the **Stop** key before **Image Processing** can be applied.

### 3.7.17 Auto Reset on Scan

Image processing functions can be applied in real-time mode, as scanned item is being presented to the operator for analysis.

By default, the image processing selected is applied to all subsequent scanned items. However, when Auto Reset on Scan is enabled, the image processing will be cleared each time the scanning is stopped and then resumed.

### 3.7.18 Auto Reset on New Bag

Image processing functions can be applied in real-time mode, as scanned item is being presented to the operator for analysis.

By default, the image processing selected is applied to all subsequent scanned items. However, when Auto Reset on New Bag is enabled, the image processing will be cleared each time the system detects a new bag image being presented to the operator.

# 4 OPERATION

This chapter provides and describes the system operating instructions. Before proceeding, it is important to read and fully understand all applicable Warnings and Cautions, (ref: *WARNINGS AND CAUTIONS.*

## 4.1 Getting Started

**WARNING**

**Verify the system has been installed and set-up for the correct voltage by a certified technician prior to applying power.**

**AVERTISSEMENT**

**Vérifiez que le système a été installé et configuré pour la tension correcte par un technicien certifié avant d'appliquer la puissance.**

### 4.1.1 System Checks

**NOTICE**

**The ScanOS software is activated by a dongle key. Without the dongle key, the system is will not operational.**

Before switching on, verify that:

1. The power cord is connected to the machine.
2. All service panels are closed and locked.
3. No lead curtains are torn or missing.
4. All emergency stop switches are in their released or out position.
5. There are no objects in the inspection tunnel.
6. The **OCP** and monitor are connected, and the monitor power switch is on.
7. The circuit breaker switch is set to the **ON** (**UP**) position, (ref: Figure 11).

### 4.1.2 Power Up

**⚠ CAUTION**

**Ensure the voltage and frequency marked on the plate or label is appropriate for the facility power supply before connecting.**

**The facility must provide an earth connection.**

***ATTENTION:***
***Assurez-vous que la tension et la fréquence marquées sur la plaque ou l'étiquette sont appropriées pour l'alimentation de l'installation avant de les raccorder.***

***L'installation doit fournir une connexion terrestre.***

The Rapiscan X-ray system has a rating plate or label which is located near the power inlet as shown in Figure 40.


**Figure 40: Example of a System Identification Plate**

**⚠ CAUTION**

**If there is an item inside the tunnel, calibration will be performed incorrectly, and errors may be reported. Subsequent images may also be incorrectly displayed. Ensure there is no item such as a bag inside the tunnel before switching on.**

***ATTENTION***

***s'il y a un élément à l'intérieur du tunnel, l'étalonnage sera effectué incorrectement, et des erreurs peuvent être signalées. Les images suivantes peuvent également être***

***affichées incorrectement. Assurez-vous qu'il n'y a pas d'élément tel qu'un sac à l'intérieur du tunnel avant d'allumer.***

1. Connect power cord to an electrical outlet.
2. Rotate the power key clockwise (to the right) to the **ON** (**I**) position.
3. Push the **Power On** button, (ref: Figure 41).
4. The **Power On** button will illuminate, (ref: Figure 41).
5. The X-ray system will begin its power-up sequence.
6. The blue lights at the tunnel entrance and exit illuminate to indicate power has been turned on.
7. If the blue lights do not illuminate, check the facility power, the power cord, and the circuit breaker.
8. The X-rays will turn on briefly to calibrate the system.

**Notes: Once switched on, the machine performs automatic tunnel clearance. During the clearance, the conveyor belts become operational and run in either forward or reverse for a few moments. You can abort tunnel clearing by pressing R/STOP button.**

**If there is baggage inside the tunnel, calibration will be performed incorrectly, and errors may be reported. Subsequent images may also be incorrectly displayed. Verify that there is no baggage inside the tunnel before turning the machine on.**

***Notes: une fois allumé, la machine effectue un dégagement de tunnel automatique. Pendant le dégagement, les courroies transporteuses deviennent opérationnelles et fonctionnent en avant ou en arrière pendant quelques instants. Vous pouvez interrompre le nettoyage du tunnel en appuyant sur le bouton R/STOP.***

***S'il y a des bagages à l'intérieur du tunnel, l'étalonnage sera effectué incorrectement et des erreurs peuvent être signalées. Les images suivantes peuvent également être affichées incorrectement. Vérifiez qu'il n'y a pas de bagage à l'intérieur du tunnel avant d'allumer la machine***


**Figure 41: Emergency Stop, Key Switch, Power On Button**

### 4.1.3 System Indicator Lights


**Figure 42: System Power ON Indicator**


**Figure 43: X-ray ON Indicator and Search Indicator**

### 4.1.4 Logging On

**NOTICE**

**It may take several minutes for the Logon screen to appear after switching the system on.**

**Avis:**

**Il peut prendre plusieurs minutes pour que l'écran d'ouverture de session apparaisse après avoir allumé le système.**

1. After calibration, the **Logon** screen appears, (ref: Figure 44).
2. The **Logon** screen, (ref: Figure 44) contains fields for the **User ID** and **Password**, both of which must be correctly entered in order for the operator to access the **Operator Main Screen**. In addition, the **Logon** screen contains information in the lower right-hand corner that refers to the software version, machine serial number, and model number of the Rapiscan X-ray machine.
3. Finally, the **Logon** screen contains two buttons in the lower left hand corner of the screen, one green, one red. These correspond to the **OCP** keys of the same color. The green button allows the operator to shift from **W** to **Y** and from **X** to **Z** on the **Z Effective** (**ZEF**) and **SEARCH** (**SER**) keys on the OCP. The red button acts as a backspace key when typing in the **User ID** and **Passwords**.
4. Enter the correct **User ID**, click the left touchpad button, enter the correct **Password**, and left click to logon.

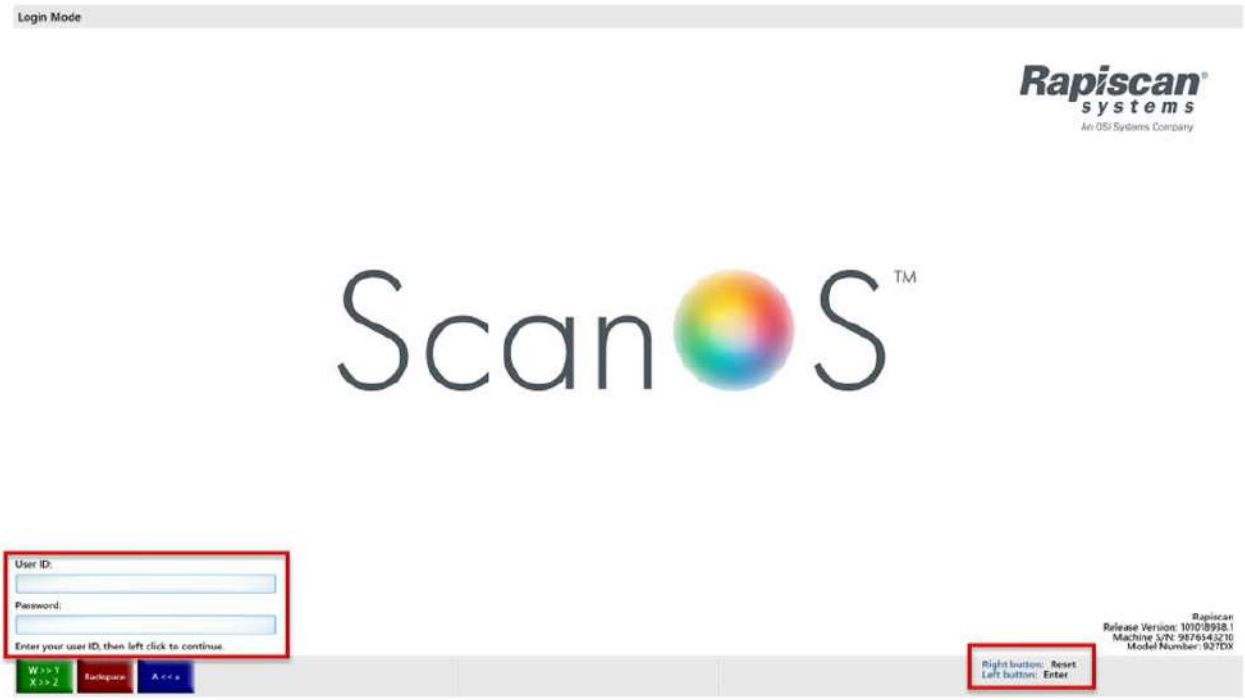



**Figure 44: Logon Screen**

### 4.1.5 Navigating Screens and Menus

The X-ray systems use an OCP which includes a touchpad and two touchpad buttons (similar to the buttons on a standard mouse).

The touchpad buttons are always active and used in navigating various menus and screens. The left touchpad button causes the menus to display and is used to select or open menus.

The right touchpad button closes menus. However, the touchpad cursor does not appear on every screen or menu.

On those screens where the cursor is not available, control panel keys (such as the arrows keys to navigate up, down and sideways), and the touchpad allows the user to navigate the screen menus.

In addition, keyboard keys may be used for navigating menus as shown in Figure 45.


**Figure 45: Using Keyboard Keys to Navigate Menus**

### 4.1.6 Logging Out

1. Access the **Screener Menu**.
2. Click the OCP left mouse button.
3. Select **Log Out** as shown in Figure 46.


**Figure 46: Screeners Menu - Log Out**

4. After clicking **Log Out**, the system returns to the **Logon** screen, (ref: Figure 44).

### 4.1.7 Power Down

**⚠ WARNING**

**Under no circumstance shall the operator use the Emergency Stops on the OCP or on the external sides of the X-ray cabinet for a normal shut down procedure. E-Stops are to be used only in case of an emergency.**

***Avertissement***

***En aucun cas l'exploitant n'utilisera les butées d'urgence sur l'OCP ou sur les côtés extérieurs de l'armoire à rayons X pour une procédure d'arrêt normale. Les E-stops ne doivent être utilisés qu'en cas d'urgence.***

1. Rotate the **Key Switch** counterclockwise (to the left) to the **OFF** (**O**) position, (ref: Figure 47).
2. The Power button on the OCP as well as the power indicator on the outside of the cabinet will turn off indicating the machine has safely shut down, (ref: Figure 48).
3. If the machine is left unattended, remove the key from the **Key Switch**. The key should be maintained by the facility RSO or designee to prevent unauthorized use.

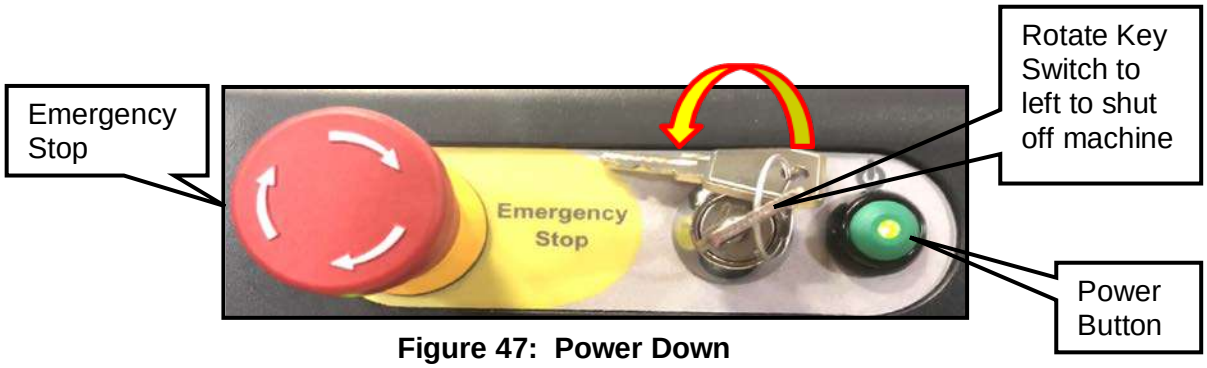



**Figure 47: Power Down**

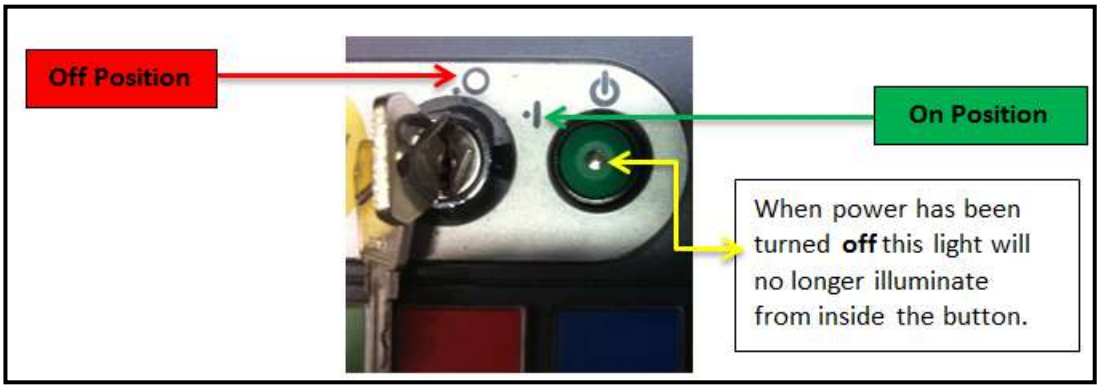



**Figure 48: On/Off Switch and Power Indicator**

## 4.2 Cut-Free Imaging

The system provides cut-free imaging so that all scanned object images show the entire object. If a bag is under the X-ray beam path and the conveyor motion is halted (by the operator pressing the conveyor stop button), when scanning is resumed the remainder of the object will scroll onto the screen with no discontinuities.

## 4.3 Scanning Baggage

1. Perform the **Logon** procedure, (ref: Section 4.1.4).
2. Objects to be scanned should be placed lengthwise on the conveyor belt with all straps and projections underneath (if possible) to achieve the best image.
3. Press the green **S** button (Forward) on the **OCP**, (ref: Figure 49).
4. The conveyor will run forward until the **R** button is pressed, (ref: Figure 49).
5. When the bag enters the tunnel, the X-rays turns on, and an image of the bag will be displayed on the screen.
6. When the bag has emerged from the other end of the tunnel, press the **R/STOP** button to stop the conveyor. A typical image is shown in Figure 50.

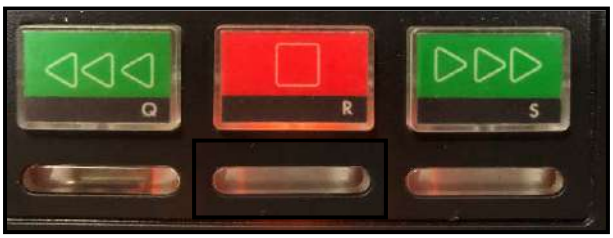



**Figure 49: Conveyor Control Buttons**

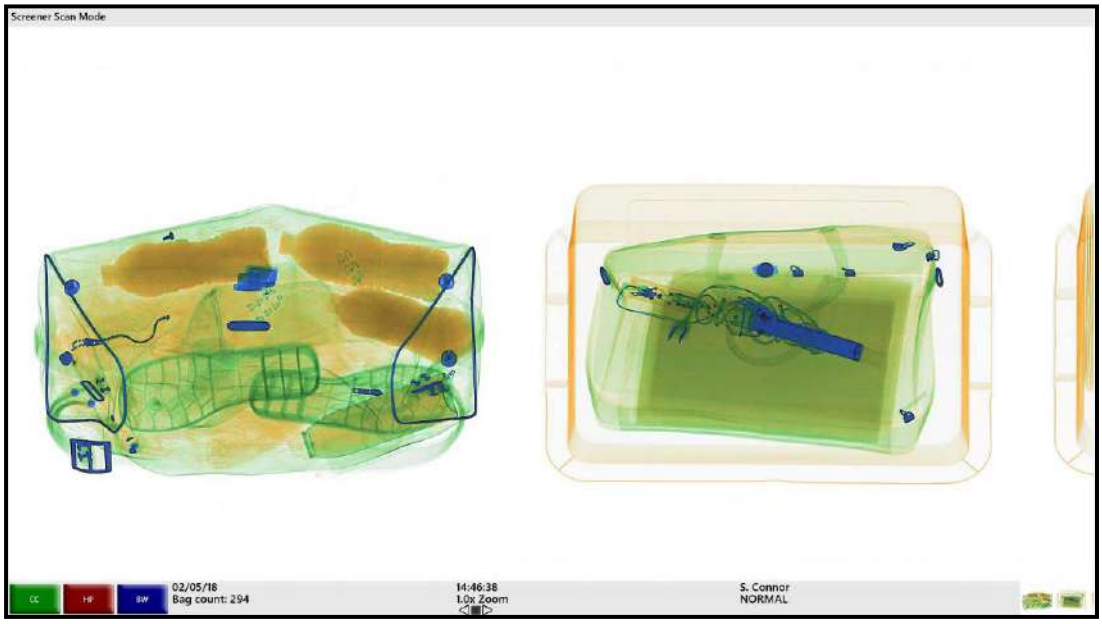



**Figure 50: Typical Scanned Image**

## 4.4 Search


The **SEARCH** (**SER**) button is used to indicate that an additional search (either manual or via further scanning) should be carried out on a particular bag. An operator, who suspects that there may be a threat or contraband in a particular bag, should perform the following steps:

1. To initiate a search, press the **SER** button, and then follow the appropriate established security procedures.
2. When the **SER** button is pressed, the search lamp will illuminate, an audible buzzer sounds, and the conveyor belt will stop.

## 4.5 Previous and Next Bag

In this mode, the operator is able to scroll in reverse to view a previous bag or to scroll forward to return to the latest bag. The **Mode Indicator Panel** reads: **Scanned Image Review Mode** which is the mode the system enters when allowing review of previous and next bags.

### 4.5.1 Previous Bag (PB)

To access **Previous Bag** (**PB**):


1. Press the **PB** button on the **OCP**.
2. When the **PB** button is pressed, the previous bag will scroll back until it is completely on the screen, (ref: Figure 51).
3. The **Previous Bag** is outlined in red, (ref: Figure 51).

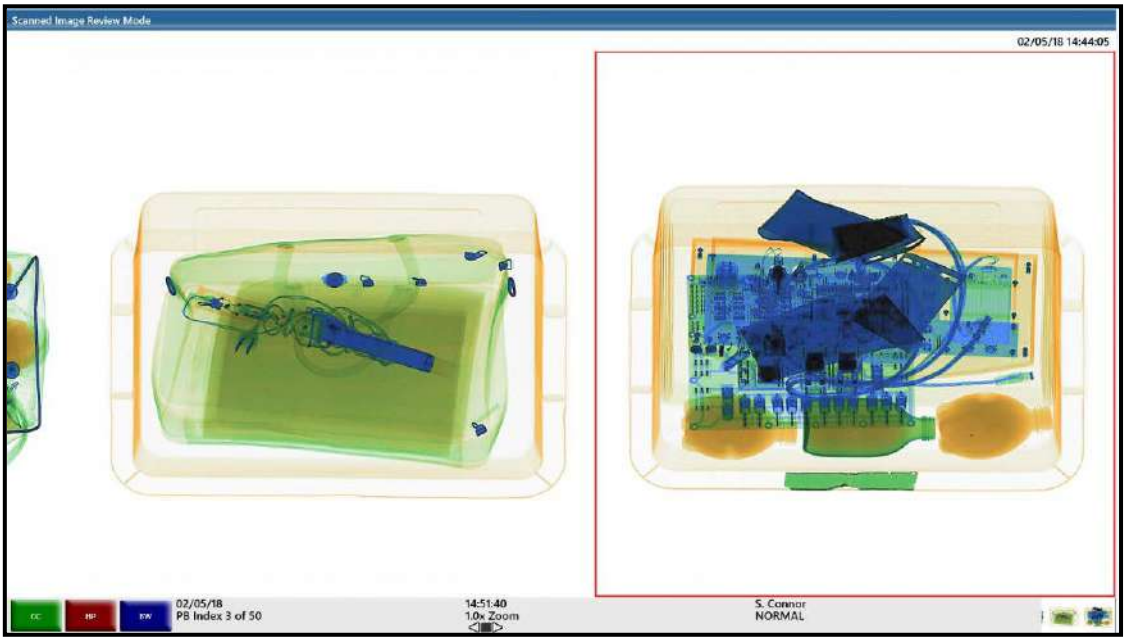



**Figure 51: Previous Bag**

4. The **Previous Bag** will be any previous scanned bag's image that is completely or partially on screen.
5. When the operator reaches the end of the image review buffer in **Previous Bag** mode, a message appears, reading: **End of Image Review Buffer**. Press the **NB/J** button to clear this message box". The message disappears automatically after five (5) seconds.
6. The **R** or **Stop** button can be used to exit the **Previous Bag** or **Next Bag** mode and return to the **Normal** mode.

**Note: Each bag in Previous Bag mode has a date/stamp indicator above the bag's image on screen.*Note: chaque sac en mode sac précédent a un indicateur de date/timbre au-dessus de l'image du sac à l'écran.***

### 4.5.2 Next Bag (NB)

To access **Next Bag** (**NB**):


1. Press the **NB** key on the **OCP** (after the **Previous Bag (PB)** has been activated).
2. When the **NB** button is pressed, the next bag will scroll on the screen and the **Next Bag** is outlined in red, (ref: Figure 52).

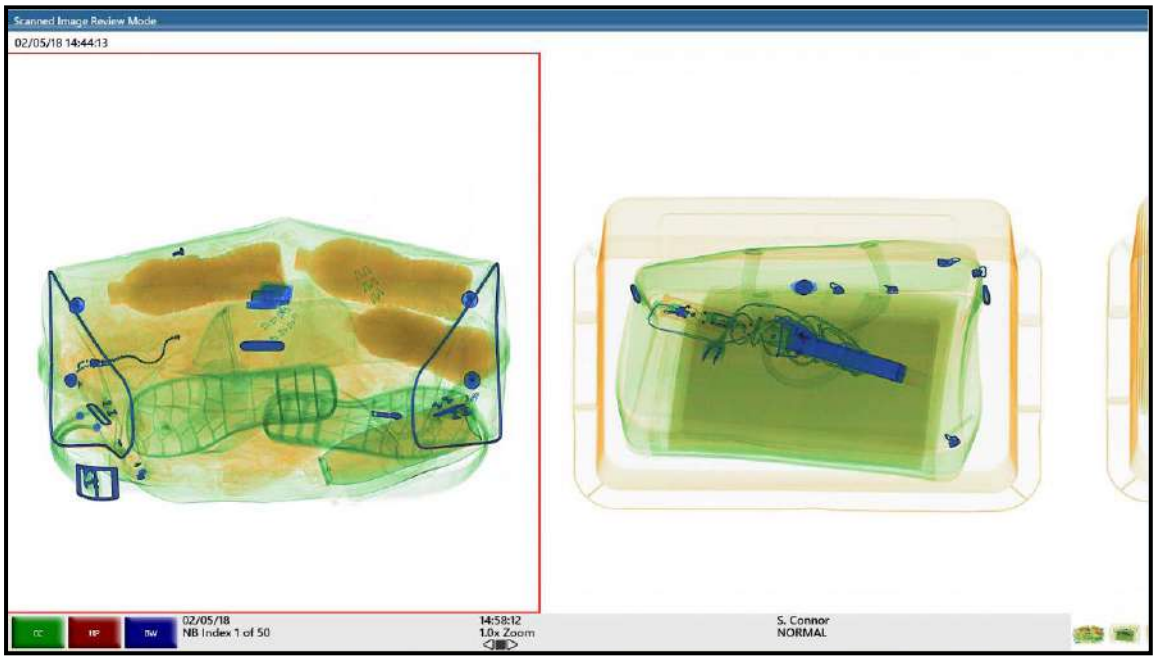



**Figure 52: Next Bag**

3. When the operator reaches the end of the image review buffer in **Next Bag** mode, a message appears, reading: **End of Image Review Buffer. Press the NB/J button to clear this message box**. The message disappears automatically after five (5) seconds.

4. A message reading **End of image review buffer. Press the PB/I button to clear this message box** appears on screen once the operator has reached the end of the image review buffer when in **Next Bag** mode. The message disappears automatically after five (5) seconds.
5. The **R** or **Stop** button can be used to exit the **Next Bag** mode and return to **Normal** mode.

**Note: Each bag in Next Previous Bag mode has a date/stamp indicator above the bag's image on screen.**

**Note: chaque sac dans le mode précédent de sac suivant a un indicateur de date/timbre au-dessus de l'image du sac à l'écran.**

## 4.6 Archive

### 4.6.1 Auto Archive

This function automatically archives all scanned images on the hard disk of the computer.

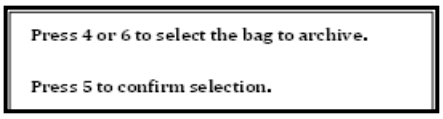
The number of images that can be archived is limited to hard disk space or to a configurable allowable maximum disk space, whichever is smaller.

### 4.6.2 Manual Archive


This function allows one of the most recently scanned bags that are still on-screen to be manually archived on the hard disk of the computer.

The number of images that can be archived is limited to hard disk space or to a configurable allowable maximum disk space, whichever is smaller.

1. With the system in **Stop** mode, press the **V** or **AR** button on the **OCP**.
2. The archived image will be shown in red, and a message appears above the image, (ref: Figure 53).
3. Pressing **4** on the **OCP** numeric keypad causes the red square to move to the left. Pressing **6** will cause the red square to move to the right.
4. Press **5** in order to confirm the selection of the bag to be archived, and a message confirming the selection appears briefly, (**Archive Succeeded**).



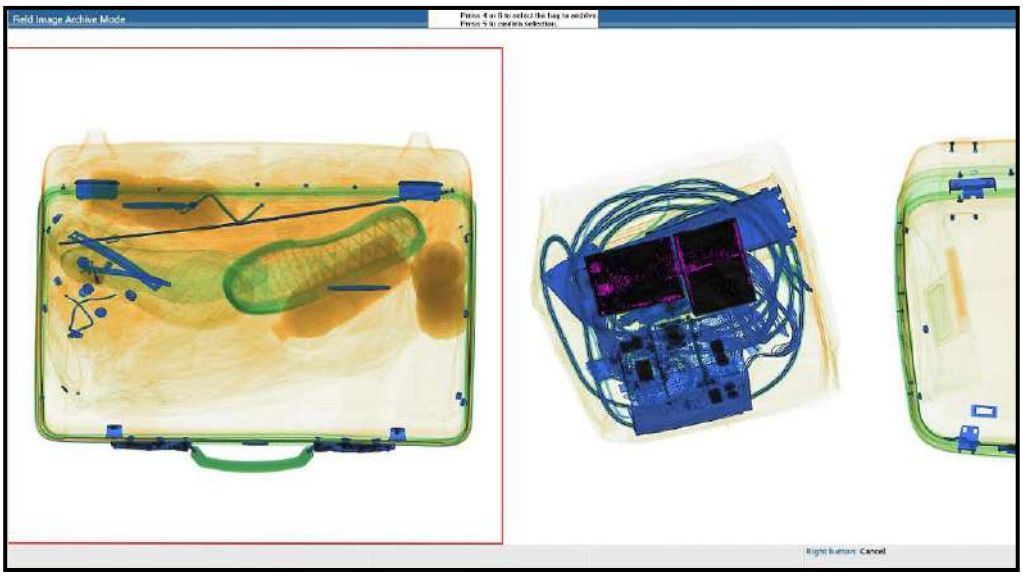



**Figure 53: Archive Image**

## 4.7 Annotation Options

The **Annotation Option** allows the annotation of images with multiple annotation options and allows suspected threats to be highlighted for secondary inspection.

**NOTICE**

**By default, the system is configured to be set to Bag Selection with Annotation. To change to Annotation or Bag Selection with Annotation, the Operator (scanner) MUST log out, (ref: Section 4.1.6) of the Screener Scan Mode.**

***Avis***
***Par défaut, le système est configuré pour être défini sur sélection de sac avec annotation. Pour passer à l'annotation ou à la sélection de sac avec annotation, l'opérateur (scanneur) doit se déconnecter (Ref: section 4.1.5) du mode de balayage de l'écran***

### 4.7.1 Bag Selection

1. **Bag Selection** allows the screener to select the bag if any threat is detected. Press **X**, if TIP is enabled, a TIP information message will be displayed, and then press **R** to enter the **Bag Selection** mode as shown in Figure 54.
2. Press **4** or **6** on the keyboard to select the bag.
3. Press **5** to confirm the bag selection.


**Figure 54: Bag Selection**

### 4.7.2 Annotation

1. **Annotation** allows the **Screener** to perform annotation actions on the image. Press **X**, if **TIP** is enabled, a **TIP** information will be displayed, and then press **R** to enter the **Annotation Mode** as shown in Figure 55.
2. Using the left mouse button, outline the suspected item by clicking the left mouse button, dragging the cursor to create the annotation box, and click the left mouse button again to complete the annotation.
3. Press **X** to confirm the annotation.

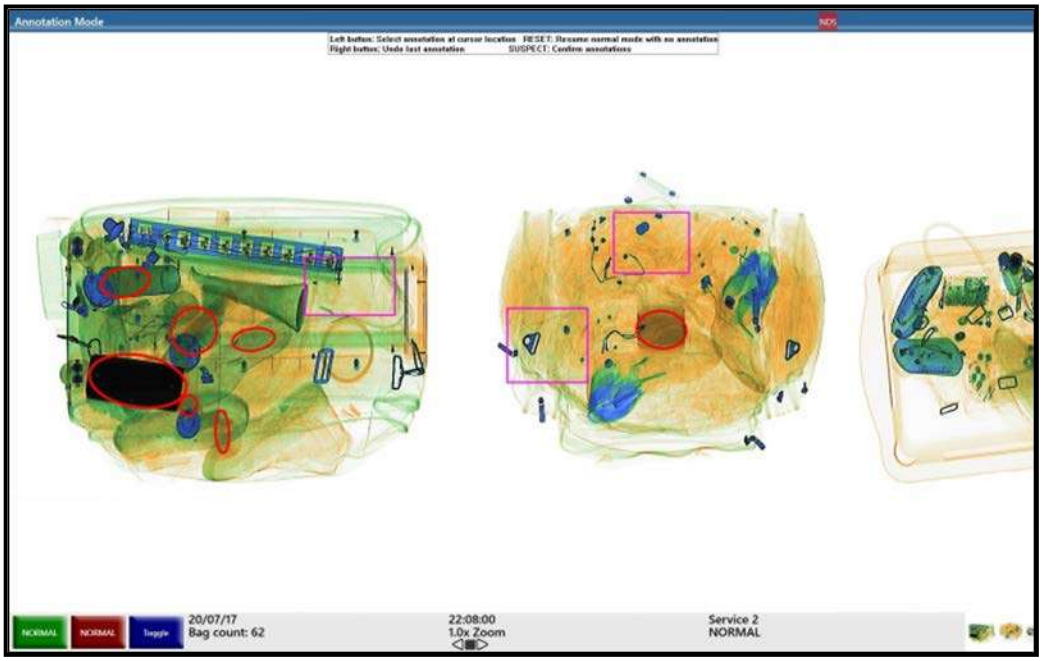



**Figure 55: Annotation**

### 4.7.3 Bag Selection with Annotation

1. **Bag Selection with Annotation** allows the **Screener** to select the required image/bag and perform annotation. Press **4** or **6** on the keyboard to select the bag.
2. Using the left mouse button, outline the suspected item by clicking the left mouse button, dragging the cursor to create the annotation box, and click the left mouse button again to complete the annotation.
3. Press **5** to confirm the bag selection, (ref: Figure 56).

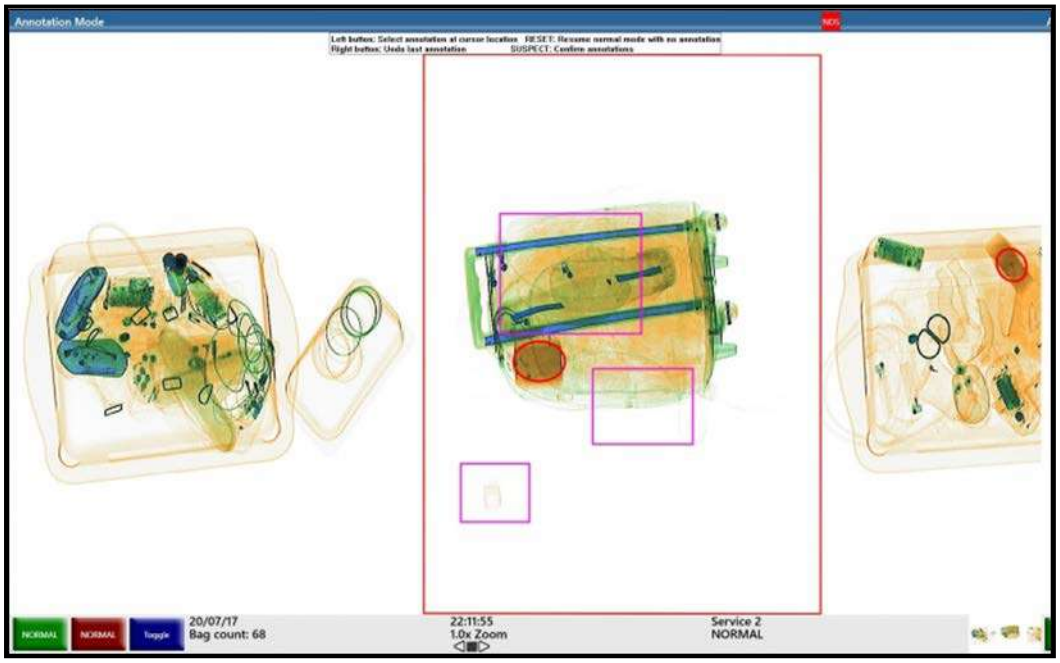



**Figure 56: Bag Selection with Annotation**

# 5 SCREENER SCAN MODE

**NOTICE**

**This chapter details standard features for the ScanOS software. Optional features are described in APPENDIX C - FEATURES, OPTIONS, OPERATIONAL TEST KITS (OTKS), AND SOFTWARE OPTIONS**.

**NOTICE**

## 5.1 Color Lookup Table (LUT)

Depending on the **Color LUT** selection made by **Service**, the displayed images will either appear as **Rapiscan Spectrum-4** as shown in Figure 57 or **Rapiscan Classic** color as shown in Figure 58.


**Figure 57: Example Rapiscan Spectrum-4**

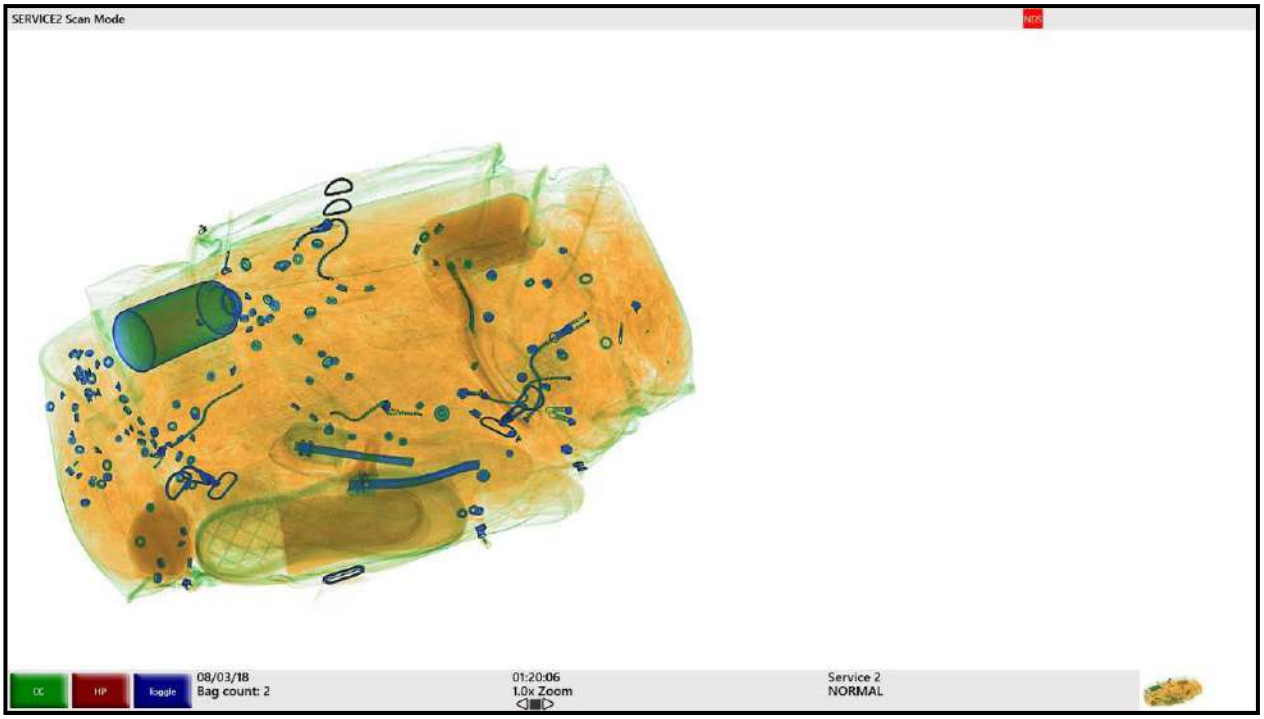



**Figure 58: Example Rapiscan Classic**

To enter the **Screener Scan Mode**, log on as described in Section 4.1.4, and enter the screener **User ID** and **Password**. The **Screener Scan Mode** screen displays as shown in Figure 59.

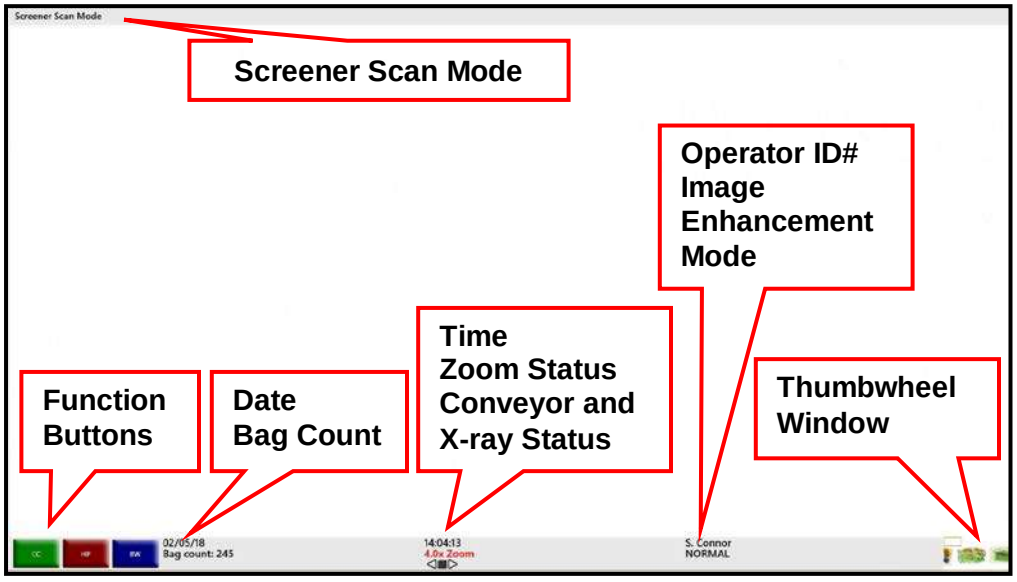



**Figure 59: Screener Scan Mode Screen**

1. The **Screener Scan Mode** screen displays.
   a. The system's current mode of operation, as indicated at the top left corner of the **Screener Scan Mode** screen). The panel at the top of the screen is called the **Mode Indicator Panel**.
   b. Three **Programmable Function** buttons are read **CC**, **HP** and **Toggle**.
      - Date
      - Bag count
      - Time
      - Zoom status (2x, 4x, 8x, 16x, 32x and/or 64x)
      - Operator ID
      - Image Enhancement mode (e.g., **Normal**, **Crystal Clear**, **Black** and **White**, etc.).
      - Conveyor status, i.e., **Reverse**, **Stop** or **Forward**). The indicator at the bottom of the screen will be highlighted in red only when that function is selected. If the conveyor is moving forward to the right then only the arrow pointing to the right will be highlighted.

2. The **Conveyor Status/ Thumbnail Window**, (ref: Figure 60) displays a view of the whole screen in the bottom right hand corner so that when zooming into a bag on the main display, the operator can know where they are relative to the bag. This window will help the operator to navigate with ease when zooming.

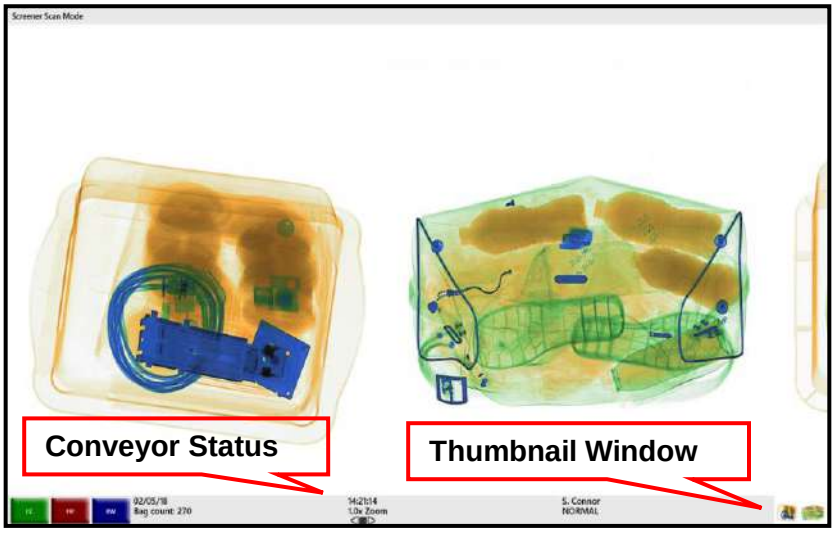



**Figure 60: Conveyor Status/Thumb Nail Window**

## 5.2 Screener Menu

1. To access the **Screener** menu, (ref: Figure 61) click the left mouse button. Click the right mouse pad button reverses this choice, and the menu will slide out of sight. The **Screener Scan Mode** screen displays, (ref: Figure 59).
2. Use the touch pad to scroll up and down to access the menus shown on the **Screener** menu, (ref: Figure 61).
   - Image Processing
   - Reports
   - Help Manuals
   - System Information
   - Machine Serial Number
   - Shut Down
   - Log Out


**Figure 61: Screener Menu**

### 5.2.1 Image Processing

**Image Processing** is described in Section 0.

### 5.2.2 Reports

1. Select **Reports** from the **Screener** menu, (ref: Figure 61).
2. Selecting **Reports** displays the **View Screener Report** screen shown in Figure 62.


**Figure 62: View Screener Report Screen**

#### 5.2.2.1 View Screener Reports

1. Selecting **View Screener Reports** from the **View Screener Report** screen, (ref: Figure 62) displays the **Report Data** screen shown in Figure 63.
2. Selecting **View Reports** from the **Report Data** screen displays the **View Screener Report** screen shown in Figure 64.
3. Click the **Close** button to exit the **Report Data** screen.

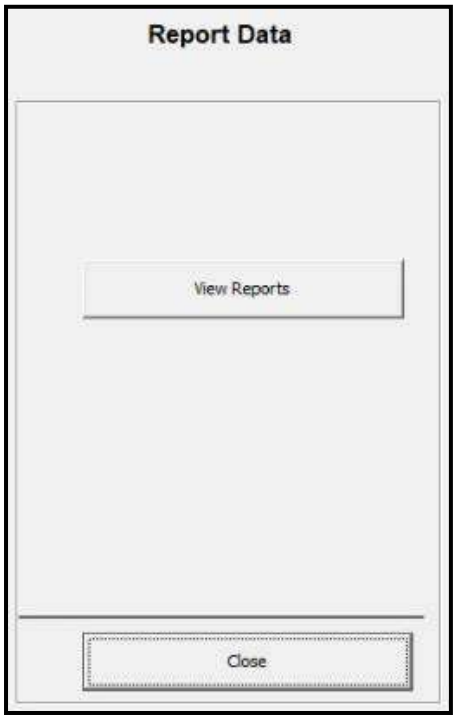



**Figure 63: Archive Review Selection Screen**

4. The **View Screener Report** screen shown in Figure 64 contains a set of tabs across the top of the screen. Select the desired tab, enter the appropriate data in the lower part of the screen and click the **Update** button to refresh the screen and to view the selected report.
5. Click the **Close** button to exit the **View Screener Report** screen.

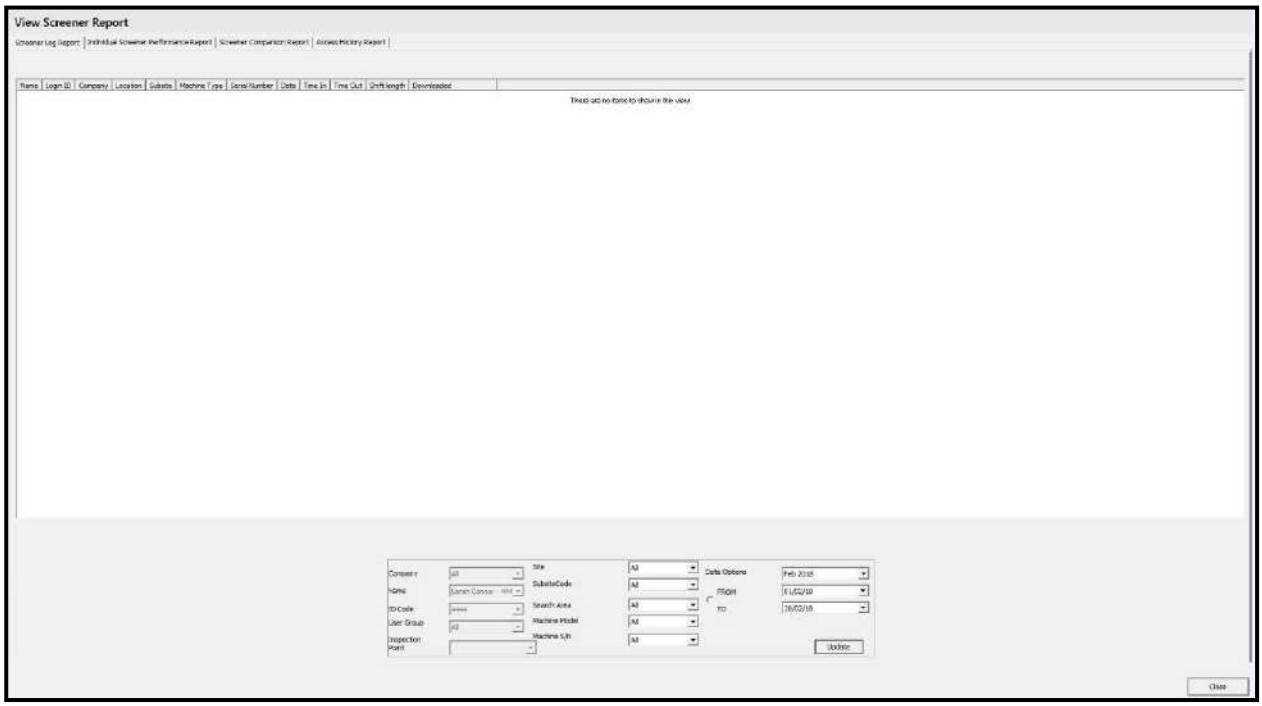



**Figure 64: View Screener Report Screen**

### 5.2.3 Help Manuals

1. Selecting **Help Manuals** from the **Screener** menu, (ref: Figure 61) displays the **Help Manuals** menu shown in Figure 65.
2. Selecting **Operator Manual** displays the operator manual.
3. Once the operator manual is displayed and reviewed, click the **Close** button to exit the manual.

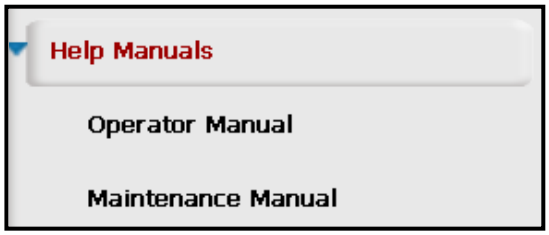



**Figure 65: Help Manuals Menu**

### 5.2.4 System Information

1. Selecting **System Information**, (ref: Figure 66) from the **Screener** menu, (ref: Figure 61) displays the **System Information** screen shown in Figure 67.


**Figure 66: System Information**

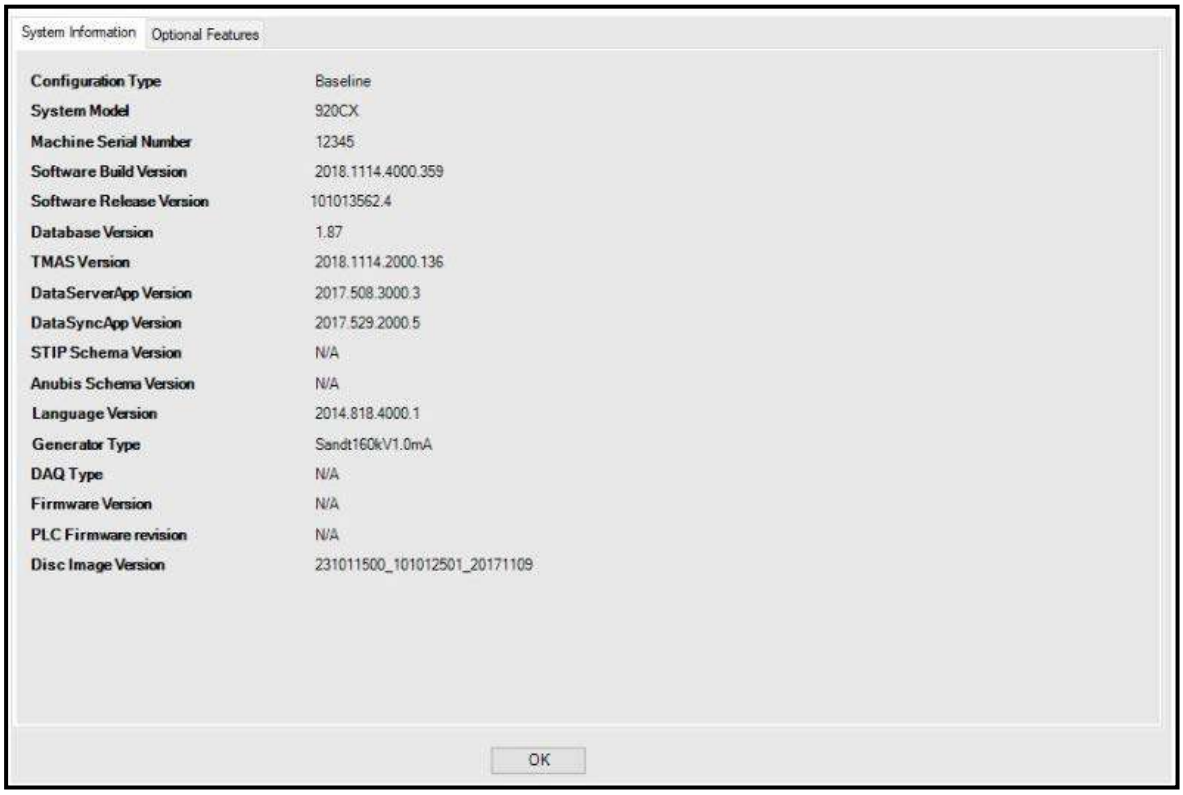



**Figure 67: Example of System Information**

2. Click the **OK** button to exit the **System Information** screen or click the **Optional Features** tab to display the **Optional Features** shown in Figure 68.

**NOTICE**

**Optional features may have been installed on the system depending on how the machine was configured. Refer to** APPENDIX C - FEATURES, OPTIONS, OPERATIONAL TEST KITS (OTKS), AND SOFTWARE OPTIONS.

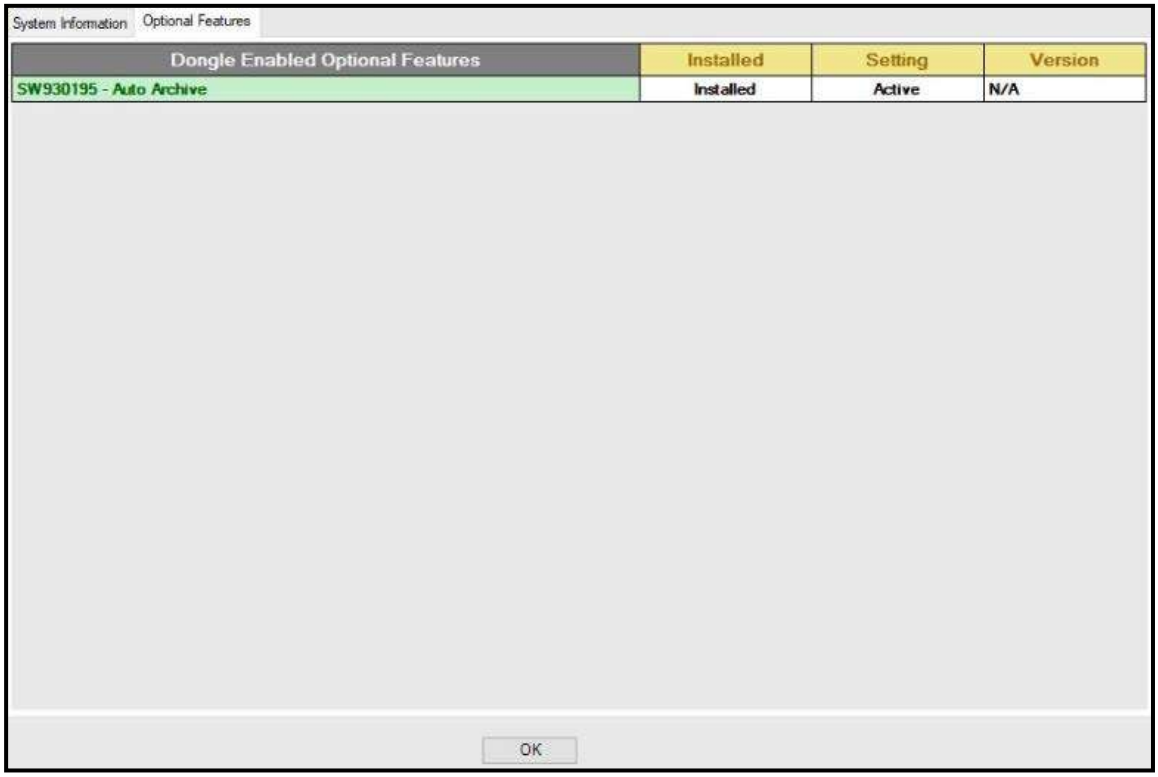



**Figure 68: Example of Optional Features Tab**

3. Clicking the **OK** button exits the **Optional Features** screen and returns to the **Screener** menu, (ref: Figure 61).

### 5.2.5 Machine Serial Number

1. Selecting **Machine Serial Number**; (ref: Figure 69) from the **Screener** menu, (ref: Figure 61) displays the **Machine Serial Number**.
2. The machine's serial number is the best way to match a machine with its service/maintenance history.


**Figure 69: Machine Serial Number**

### 5.2.6 Shut Down

NOTICE

**Depending on the machine configuration, Shut Down may not be an available option. If Shut Down is available on the on Screeners menu, and if selected, will shut down the system.**

1. Select **Shut Down** from the **Screeners** menu.
2. Selecting **Shut Down** will display a confirmation message prompting the user to confirm by either pressing **1** to confirm or **0** to cancel as shown in Figure 70.

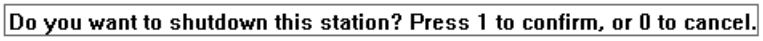



**Figure 70: Shut Down Message**

### 5.2.7 Log Out

Log out is described in Section 4.1.6.

# 6 OPERATOR MAINTENANCE AND TROUBLESHOOTING

## 6.1 Planned Preventive Maintenance

**WARNING: Do not service until all power is secure. Safely remove AC power from machine and unplug power cord. Follow general lockout tag out procedure. Please note that Rapiscan machines do not come with locks for this procedure. Customers are responsible for providing lockout/tag out equipment and installing it at their facility power (circuit breaker).**

***AVERTISSEMENT: ne pas servir jusqu'à ce que toute la puissance soit sécurisée. Retirez en toute sécurité l'alimentation C.A. de la machine et débranchez le cordon d'alimentation. Suivez la procédure de verrouillage général de la balise. Veuillez noter que les machines Rapiscan ne sont pas équipées de serrures pour cette procédure. Les clients sont responsables de fournir l'équipement de verrouillage/étiquetage et de l'installer à leur puissance d'installation (disjoncteur).***

**WARNING: Care must be taken to prevent water or any other liquid entering the system. Make sure any cleaning cloth is wrung out before use.**

***ATTENTION: il faut prendre soin d'empêcher l'eau ou tout autre liquide entrant dans le système. Assurez-vous que tout chiffon de nettoyage est arraché avant utilisation.***

If the system is to be dismantled in any way, or if an internal inspection of the tunnel is necessary, then the system must be switched off and disconnected from the main supply. The keyboard key is to be in the possession of the maintenance technician.

Some parts of the X-ray system are heavy and require two persons during removal.

### 6.1.1 Weekly Maintenance

#### 6.1.1.1 Preparation

The weekly maintenance routines consist of visual inspection and cleanliness of the system; they are detailed in sequential order. If the operating environment warrants it, they should be performed more regularly. This is usually performed by the system's operators.

1. Read the *WARNINGS AND CAUTIONS* at the beginning of this manual before proceeding.
2. Switch off the system and remove the keyboard key.
3. Remove the main supply to the system.

**⚠CAUTION**

**Care must be taken to prevent water or any other liquid entering the system. Wipe any liquid off as soon as possible prior to operating the machine.**

***ATTENTION: il faut prendre soin d'empêcher l'eau ou tout autre liquide entrant dans le système. Essuyez tout liquide dès que possible avant d'utiliser la machine.***

#### 6.1.1.2 Visual Inspection

1. Visually inspect all the covers and panels for damage and security.
2. Damaged covers and panels and any missing fasteners must be replaced.

#### 6.1.1.3 Conveyor Belt and Video Monitor Casing

1. Using a damp lint-free cloth (soap suds may be used if required) wipe clean the surface of the conveyor belt and the casing of the monitor.
2. Dry all surfaces that have been cleaned with a dry lint free cloth.

#### 6.1.1.4 Video Monitor Screen

1. Clean the screen with an anti-static spray or liquid and a lint-free cloth.

### 6.1.2 Quarterly Maintenance

#### 6.1.2.1 Preparation

The quarterly maintenance routines are detailed in sequential order.

1. Read the *WARNINGS AND CAUTIONS* at the beginning of this manual before proceeding.
2. Switch off the system and remove the keyboard key.
3. Remove the mains supply to the system.

**⚠CAUTION**

**Care must be taken to prevent water or any other liquid entering the system. Wipe any liquid off as soon as possible, prior to operating the machine.**

***ATTENTION: il faut prendre soin d'empêcher l'eau ou tout autre liquide entrant dans le système. Essuyez tout liquide dès que possible, avant d'utiliser la machine.***

#### 6.1.2.2 System Housing

1. Using a damp lint-free cloth (soap suds may be used if required) wipe clean the surface of the system housing.
2. Dry all surfaces that have been cleaned with a dry lint free cloth.

#### 6.1.2.3 Lead Curtains

1. Visually inspect the lead curtains screening at the entrance and exit of the inspection tunnel for damage.
2. Replace any strips found to be damaged.

#### 6.1.2.4 Conveyor Visual Inspection

1. Visually inspect the conveyor belt for tears and holes, replace the belt if excessive damage is found.
2. Visually inspect the rollers of the discharge conveyor (if fitted) for signs of damage.

#### 6.1.2.5 Conveyor Motion Checks

1. Press the **Forward** button (**S**) on the operator control panel, and observe that the associated indicator is illuminated and the conveyor moves in the forward direction.
2. Check for excessive noise from each roller bearing. Excessive noise is an indicator that the bearing is defective.
3. Check the conveyor belt central deviation at each end. The maximum deviation allowable is 20mm.
4. Press the **STOP** button (**R**) on the operator control panel.
5. Press the **Reverse** button (**Q**) on the operator control panel, and observe that the associated indicator is illuminated and the conveyor moves in the reverse direction.
6. Check the conveyor belt central deviation at each end. The maximum deviation allowable is 20mm.

## 6.2 Troubleshooting

This section describes troubleshooting procedures for the 9xx Systems that can be performed by an operator, and does not cover all possible problems or provide all possible solutions. For questions concerning servicing and maintenance of Rapiscan systems, please refer to *APPENDIX E*.

**⚠ WARNING**

**Any troubleshooting beyond what is described below is to be carried out by a trained and qualified maintenance technician only.**

***AVERTISSEMENT: tout dépannage au-delà de ce qui est décrit ci-dessous doit être effectué par un technicien d'entretien formé et qualifié seulement.***

### 6.2.1 System Does Not Switch On

Ensure that:

1. The system is connected to the power outlet.
2. The **Main Circuit Breaker** (**MCB**) is in the **ON** (**UP**) position.
3. The key switch on the **OCP** is rotated clockwise (to the right) to the **ON** position.

4. The power on button on the **OCP** was pressed after the key switch is turned **ON**.

### 6.2.2 X-rays Do Not Come On/Conveyor Does Not Operate

Ensure that:

1. All **E-Stops** are in the release positions.
2. If the machine is equipped with the optional IR sensor, the operator must be within range of the sensor, (within three (3) feet and directly in front of the IR beam).
3. If the machine is equipped with the optional foot mat, the operator must be standing on the foot mat.
4. Verify that the pop-up roller is in the pressed position.

Optional auxiliary roller tables are equipped with special pop-up rollers. If anything becomes wedged in the gap between the X-ray machine's conveyor and the roller table, the roller will pop up, turning off the conveyor. The pop-up roller can be manually placed in its normal position to resume conveyor operation.

**NOTICE**

**If E-Stops are not released or if the operator is not on the foot-mat and/or within the IR sensor, an error messages will result and is displayed on the screen.**

***AVIS***
***si les E-stops ne sont pas relâchés ou si l'opérateur n'est pas sur le pied-mat et/ou dans le capteur infrarouge, un message d'erreur se traduira et s'affiche à l'écran.***

# APPENDIX A - QUICK STARTUP GUIDE

For more information, refer to the 9XX Series Start-Up Guide, 101013521.

1. On the **End Panel**, locate the input power cable and ensure that it is plugged into an AC source, (ref: Figure 71.
2. Locate the system **Main Circuit Braker** (**MCB**) and ensure that it is in the **ON** (**UP**) position.

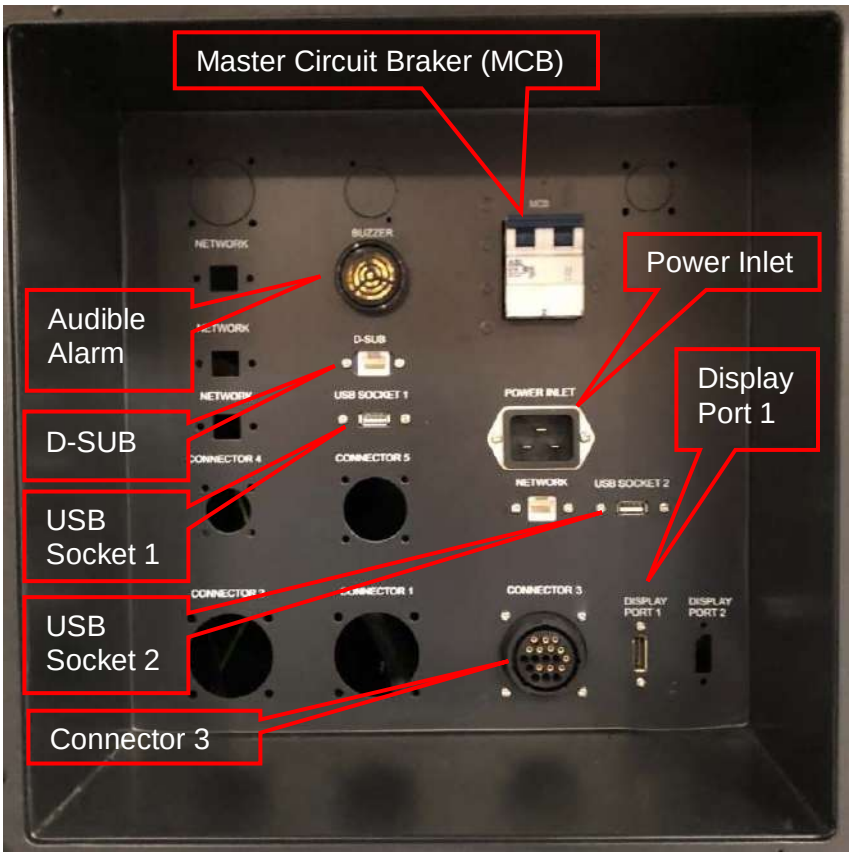



**Figure 71: Sample of Main Circuit Breaker location**

3. On the **Operator Control Panel** (**OCP**), Insert key into the key slot, rotate the key clockwise (to the right) and press the green power **ON** button, (ref: Figure 72).


**Figure 72: OCP Power Up**

**NOTICE**

**The location of the display power button and the color of the display power indicator LED may vary depending on the type and model of the monitor connected to the system.**

***Avis***

***L'emplacement du bouton d'alimentation d'affichage et la couleur de la LED de l'indicateur de puissance d'affichage peuvent varier selon le type et le modèle de l'affichage connecté au système.***

4. The system will begin the power on sequence, and the display should be on. Verify that the display power LED indicator is illuminated. If the display power LED indicator is not illuminated, verify that the monitor power cord is plugged into AC power and the monitor power button is **ON.**
5. After the power up sequence is complete, the **Logon** screen displays, (ref: Figure 73).
6. Enter the **User ID** and **Password**, (ref Figure 73) and click the left mouse button.

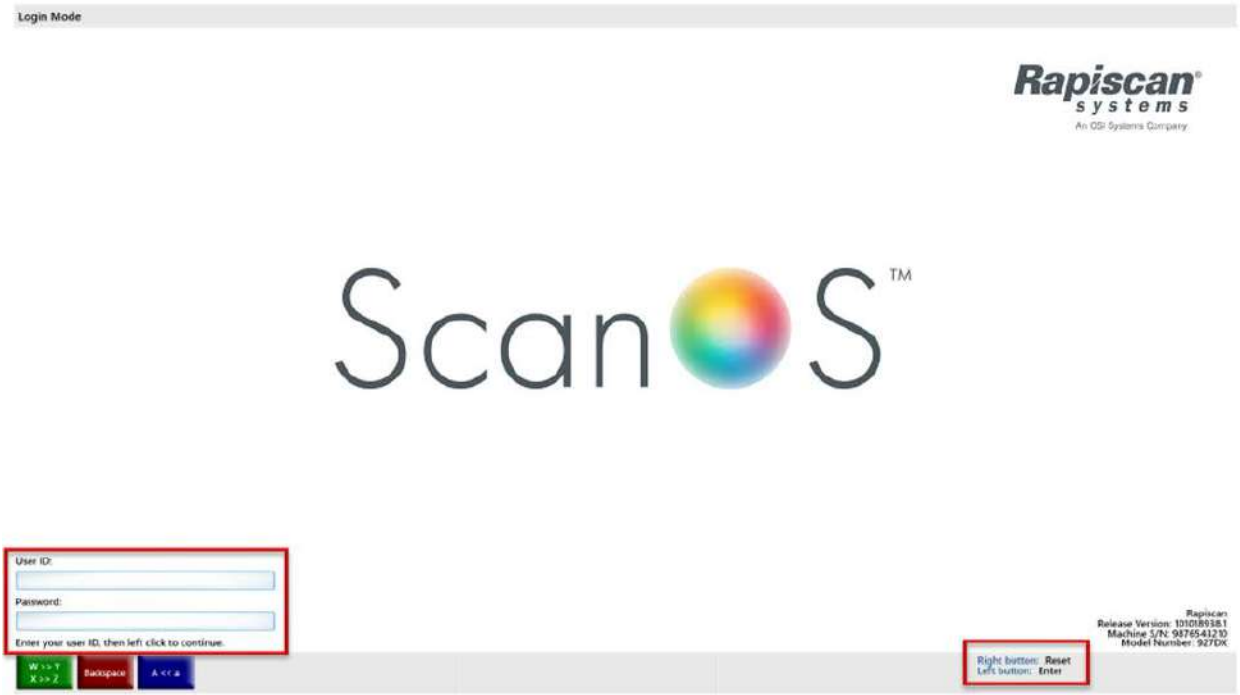



**Figure 73: Logon Screen**

7. After Logging On, the **Screener Scan Mode** screen appears as shown in Figure 74.

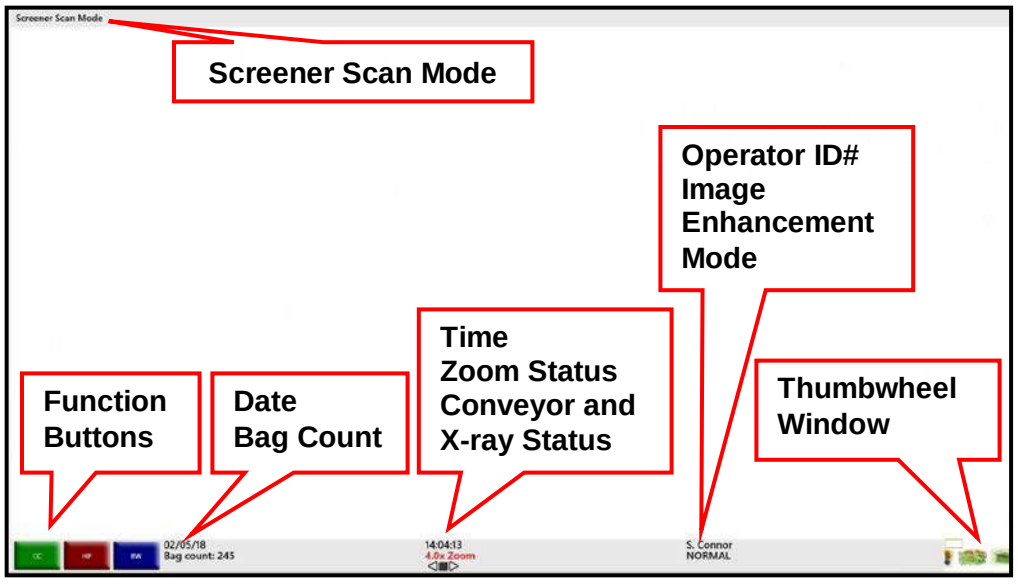



**Figure 74: Screener Scan Mode Screen**

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# APPENDIX B - REGULATORY STANDARDS

## B.1 United States

Manufacturers of cabinet X-ray systems sold in the United States are responsible for complying with the electronic product radiation control provisions of the Federal Food, Drug, and Cosmetic Act (FD&C Act), including radiation performance standards [21 U.S.C. 360hh-360ss].

The federal radiation safety performance standard for cabinet X-ray systems (performance standard) is found at 21 CFR 1020.40.

Individual state regulations must also be reviewed for additional registration and Standards for Protection against Radiation requirements. Navigate through the website www.crcpd.org which contains the applicable state registration requirements, reporting requirements, and Standards for Protection against Radiation Notice, Reports and Instruction to Worker regulations for non-medical X-ray and/or radiation emitting devices.

Cabinet X-ray systems sold in the U.S. are required to comply with all applicable requirements of the performance standard. Before selling a cabinet X-ray system in the U.S., a manufacturer must certify that its product meets the applicable requirements of the performance standard. This certification must be based on a quality control and testing program that is in accordance with good manufacturing practices. Certification of compliance with a foreign radiation safety standard cannot be substituted for certification of compliance with the U.S. performance standard.

## B.2 Canada

All baggage X-ray inspection systems sold in Canada must conform to the Radiation Emitting Devices (RED) Regulations (Schedule II, Part IV), at the time of sale. These regulations are promulgated under the RED Act, and it is the responsibility of the manufacturer or distributor to ensure the X-ray system conforms to the regulatory requirements. Since the regulations are subject to amendments in order to reflect changes in technology, information on their current applicability may be obtained by contacting the X-ray Section, Bureau of Radiation and Medical Devices, Health Protection Branch, National Health and Welfare, Ottawa, K1A 1C1. Any violation of the RED Act is a criminal offence.

Additional guidance and recommended safety procedures for the installation and use of baggage inspection X-ray equipment in Canada can be found in Safety Code 29 - Requirements for the Safe Use of Baggage X-ray Inspection Systems.

When selecting or procuring a baggage X-ray inspection system, the owner (or designated representative) is advised to obtain a copy of the most recent regulations to become familiar with those requirements, and to inquire of the intended manufacturer or importer if the product complies with those current regulations. Provincial regulations must also be reviewed for additional requirements. Go to www.canlii.org and type X-ray Regulations in the search field, and then find the applicable Provincial regulations.

The X-ray inspection unit meets EC standards. The EC declaration of conformity or the manufacturer's declaration will be forwarded to you on request.

## B.3 Europe

The X-ray inspection unit is 'CE' marked and meets the applicable European Directives. Rapiscan Systems hereby declares that the X-ray inspection unit listed in this manual conforms to the following European Union directives

- Machinery European Council Directive - 2006/42/EC
- EMC European Council Directive - 2014/30/EU
- Low Voltage European Council Directive - 2014/35/EU
- Ionizing Radiation European Council Directive - 96/29/EURATOM

The Signed copy of EC declaration of conformity or the manufacturer's declaration is available upon request.

## B.4 Other Countries

Regulatory standards vary from country to country. Check with the local country and/or region regulatory offices or contact Rapiscan (ref: APPENDIX E) for further inquiries.

# APPENDIX C - FEATURES, OPTIONS, OPERATIONAL TEST KITS (OTKS), AND SOFTWARE OPTIONS

This appendix describes feature options, OTKs, and software options for the 9xx Series Model X-ray Scanner machines.

## C.1 Feature Options

The following features are optional features that may be available upon customer request and at additional cost.

### C.1.1 External Conveyor Options

External conveyor options are available, and they can be used as in-feed conveyors or exit conveyors.

### C.1.2 Operator Presence - Foot Mat

**⚠ WARNING**

**The foot-mat must not be bypassed by placing heavy objects on it to simulate the presence of an operator. This not only damages the foot-mat but also, more importantly, allows an operator to keep the X-ray machine operating without an Operator being at the controls. Thus an Operator might place him or herself in danger while the machine is still operating: placing a limb, for example, inside the X-ray machine tunnel or touching the rollers while they are still rolling. Again, never place anything on the foot-mat other than the Operator's own weight and never do anything to circumvent the foot-mat.**

***AVERTISSEMENT***

*Le pied-tapis ne doit pas être contournés en plaçant des objets lourds dessus pour simuler la présence d'un opérateur. Cela endommage non seulement le tapis de pied mais aussi, plus important encore, permet à un opérateur de garder la machine à rayons X fonctionnant sans qu'un opérateur soit aux commandes. Ainsi, un opérateur pourrait se placer en danger pendant que la machine fonctionne encore: placer un membre, par exemple, à l'intérieur du tunnel de la machine à rayons X ou toucher les rouleaux pendant qu'ils roulent encore. Encore une fois, ne jamais placer quoi que ce soit sur le tapis de pied autre que le poids propre de l'opérateur et ne jamais rien faire pour contourner le pied-mat.*

Among the additional safety equipment offered by Rapiscan Systems is a safety foot mat. The conveyors and X-rays will shut down within less than a second if the operator removes his or her weight from the foot mat.

### C.1.3 Operator Presence Sensor

**⚠ WARNING**

**Bypassing or defeating the Operator Presence Sensor is strictly prohibited.**

**Only qualified service providers may temporarily override the Operator Presence Sensor to perform specific testing. The amount of time that the Operator Presence Sensor is in override shall be limited, and the qualified serviced provider shall test the Operator Presence Sensor when placed back into normal operating condition.**

***AVERTISSEMENT***

***Contourner ou vaincre le capteur de présence de l'opérateur est strictement interdit.***

***Seuls les fournisseurs de services qualifiés peuvent temporairement substituer le capteur de présence de l'opérateur pour effectuer des tests spécifiques. La durée pendant laquelle le capteur de présence de l'opérateur est en remplacement doit être limitée et le prestataire de services de maintenance qualifié doit tester le capteur de présence de l'opérateur lorsqu'il est replacé dans un état de fonctionnement normal.***

The Operator Presence Sensor, (ref:
Figure 75) is an optional security feature that ensures an operator is in front of the OCP while the machine is in use. The conveyor and X-ray will shut down within less than a second if the operator is leaves the range of the sensor located on the OCP**.**

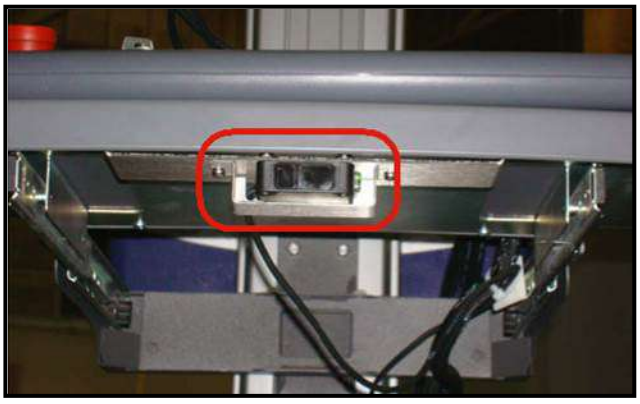


**Figure 75: Operator Presence Sensor**

## C.2 Operational Test Kits (OTKs)

This section describes the Target and NarcScan OTK's.

### C.2.1 Target Operational Test Kit (OTK)

The Target OTK is a test kit that can be employed by a ScanOS Security X-ray System Operator to assist in testing the machine's Target bulk explosives detection capability. Refer to *Document Number 04107940* for Target OTK instructions.

As illustrated in
Figure 76, the Target OTK includes a plastic case that contains various types of explosive threat simulants. Upon passing this OTK through a Target enabled scanner, three red ellipses should display on screen. This indicates that Target is properly enabled and active.

**Figure 76: Target OTK**

### C.2.2 NarcScan Operational Test Kit (OTK)

Rapiscan manufactures an OTK, part number 23107833, that is used to verify the NarcScan, bulk narcotics detection optional feature, works properly. It includes a plastic case that contains bulk narcotic simulants, as illustrated in Figure 77.

By following the usage instructions (Rapiscan *Document Number 04107941*), the operator can verify that the system provides the expected bulk narcotics detection capability.

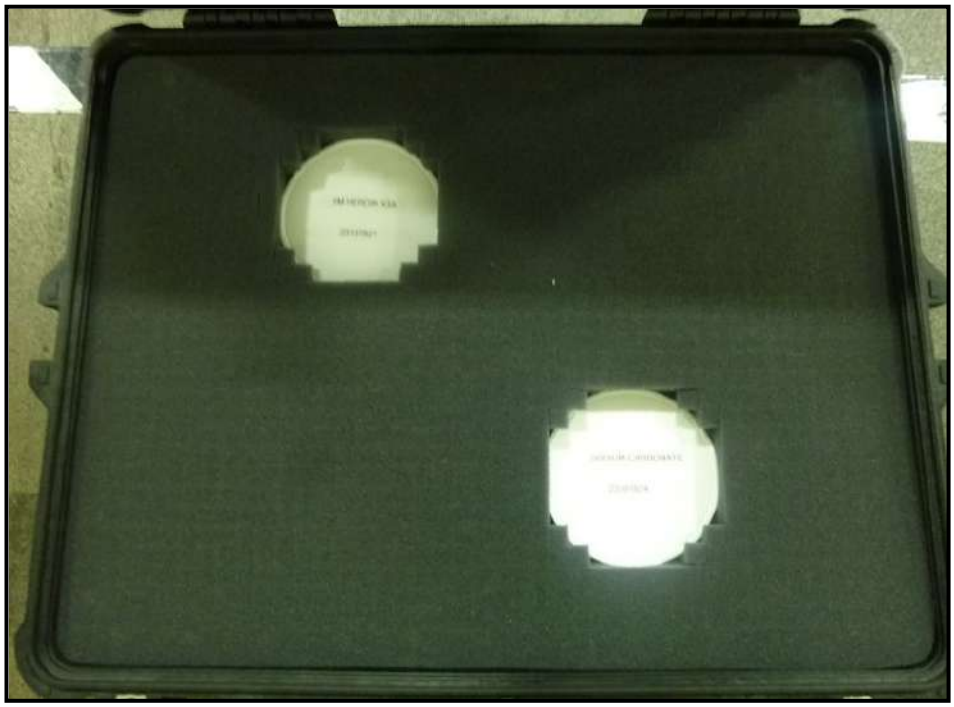


**Figure 77: NarcScan OTK**

## C.3 Software Options

NOTICE

**To view and access the available Software Options described in this section, the user must log in using the appropriate log in credentials, (ref: Section 4.1.4).**

This section describes the available software options for the 9xx Series X-ray machines. The baseline software is described in Chapter 5, SCREENER SCAN MODE.

The System Information, (ref: Section 0) includes but is not limited to the following:

- System Information
- Configuration Type
- System Model
- Machine Serial Number
- Software Build Version
- Generator Type
- Etc.

The possible **Screener Menu Options** are shown in Figure 78 and are dependent on the actual software configuration of the machine.

- ITarget
- Manual Scan
- Image Archives
- Machine Configurations
- TIP
- Enter OTP
- Print

**NOTICE**

**The following software options do not appear in the Screener Menu even when configured in the software.**

- Target
- DTA
- NarcScan
- NDS
- Smart Card
- NAR

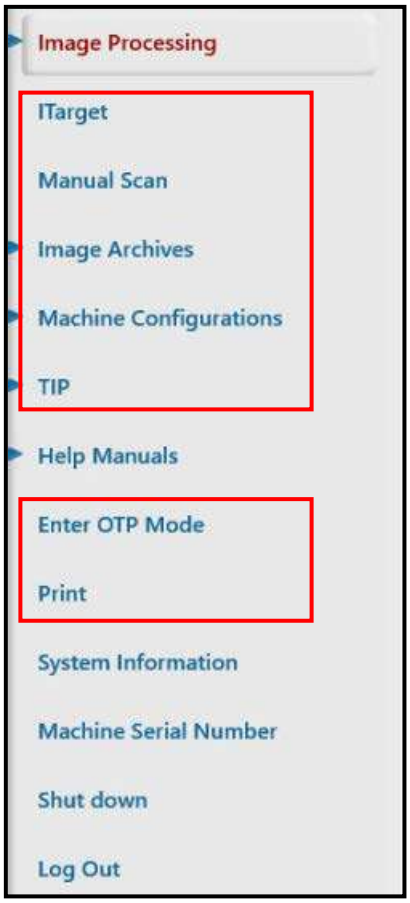



**Figure 78: Screener Menu - Options**

### C.3.1 TIP

**TIP** is a software program that projects fictional threat images (guns, knives, bombs, hazardous materials, etc.) onto real bags using pre-selected preferences, percentages and rates. The purpose of **TIP** is to increase levels of vigilance, to improve screener threat detection skills by providing more exposure to various types of threats on a regular basis, and to provide a means of tracking screener performance for training or testing.

### C.3.1.1 Fictional Threat Images (FTI)

For the ScanOS Series Rapiscan X-ray Security Scanning machines, the **TIP** image consists of an **FTI**. The **FTI** is an electronically generated single threat image overlaid onto the image of an actual passenger bag, thereby permitting screener performance to be assessed using known threat images randomly placed inside the bag.

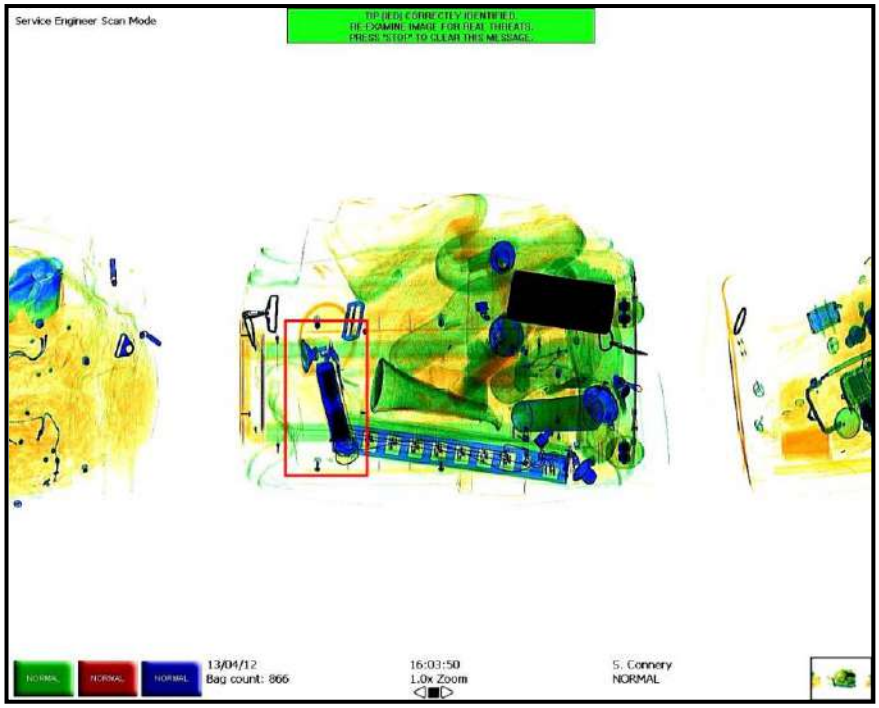



**Figure 79: Correctly Identified TIP Image**

A correctly identified **TIP** screen with the threat indicated by the red square is shown in Figure 79.

When the system tries to project an **FTI** onto a bag and the image does not fit within the boundaries of the bag, projecting the image is cancelled and a message displays, (ref: Figure 80).

When a screener identifies the presence of a projected threat by pressing the **SEARCH** button on the OCP, it is scored as a Hit and a message displays, (ref: Figure 81).

When a screener fails to identify the presence of a threat, it is scored as a Miss, (ref: Figure 82).

When a screener reports the presence of a threat by pressing the **SEARCH** button, when no **TIP** was projected, this incident is scored as a **Non-Tip Event**, (ref: Figure 83), and the Operator should either contact a supervisor or follow local site procedures for evaluating the bag as a possible threat.

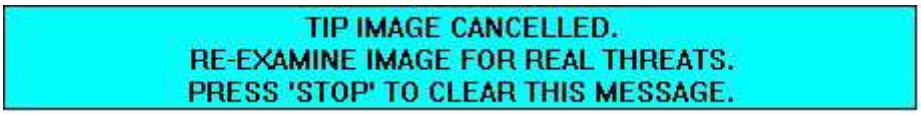



**Figure 80: TIP Image Cancelled Message**

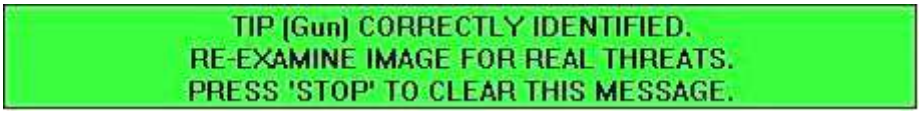



**Figure 81: TIP Correctly Identified Message**


**Figure 82: TIP Missed Message**


**Figure 83: Non-TIP Event Message (False Alarm)**

### C.3.1.2 TIP Options

1. Select **TIP** from the **Screener Menu - Options**, (ref: Figure 78).
2. Selecting **TIP** displays the **TIP** menu shown in Figure 84.

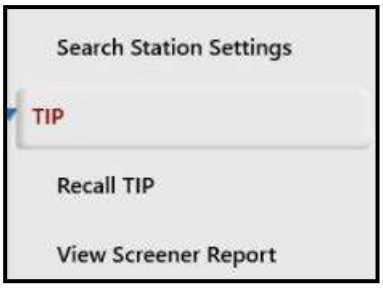



**Figure 84: TIP Menu**

### C.3.1.3 Recall TIP

1. Selecting **Recall TIP**, (ref: Figure 84) displays a recalled **TIP** image. An example of a recalled **TIP** image is shown in Figure 85.
2. Press the **Stop** (**ST**) button on the OCP to exit **Recall Tip**.

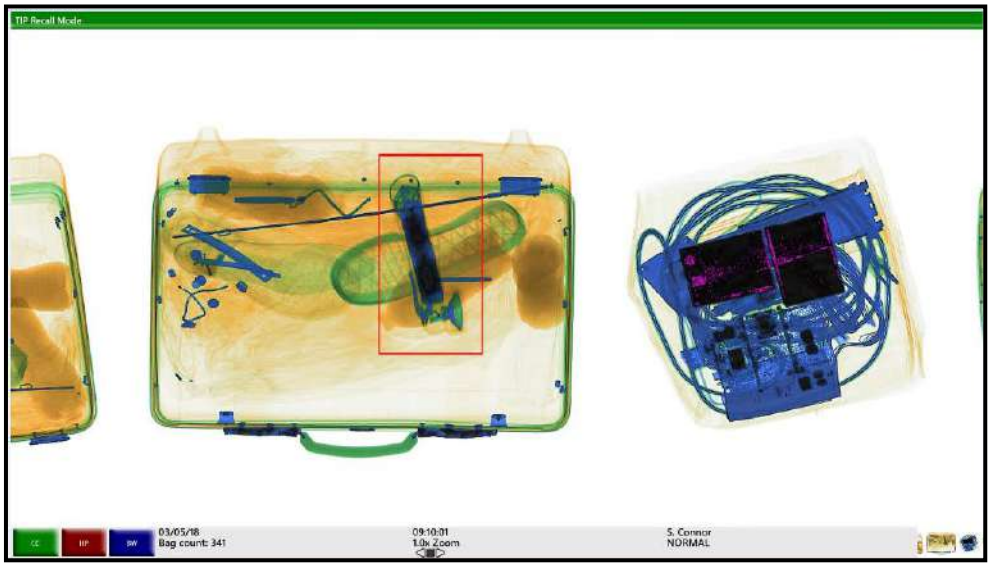



**Figure 85: Example of a Recalled TIP Image**

### C.3.1.4 View Screener Report

1. Selecting **View Screener Report** from the **TIP Menu - Options**, (ref: Figure 78) displays the **Report Data** screen shown in Figure 86.
2. Clicking **View Reports** displays the **View Screener Report** screen, (ref: Figure 87), with tabs located across the top of the screen to allow for the selection of the desired report, as well as providing fields to enter the desired search criteria in the lower section of the screen. The first tab is the **Screener Log Report**. An example of the **Screener Log Report** is shown in Figure 87.
3. After each tab is selected and the criteria have been entered in lower part of the screen, click the **Update** button to refresh the screen and to view the selected report.
4. Clicking the **Close** button on the **Report Data** screen displays the **TIP** menu.
5. If the print option is available, clicking the **Print** button prints the report to a network printer. If the print option is not available, the **Print** button will not be available.
6. Clicking the **Close** button on the **View Screener Report** screen displays the **Report Data Screen**.


**Figure 86: Report Data Screen**

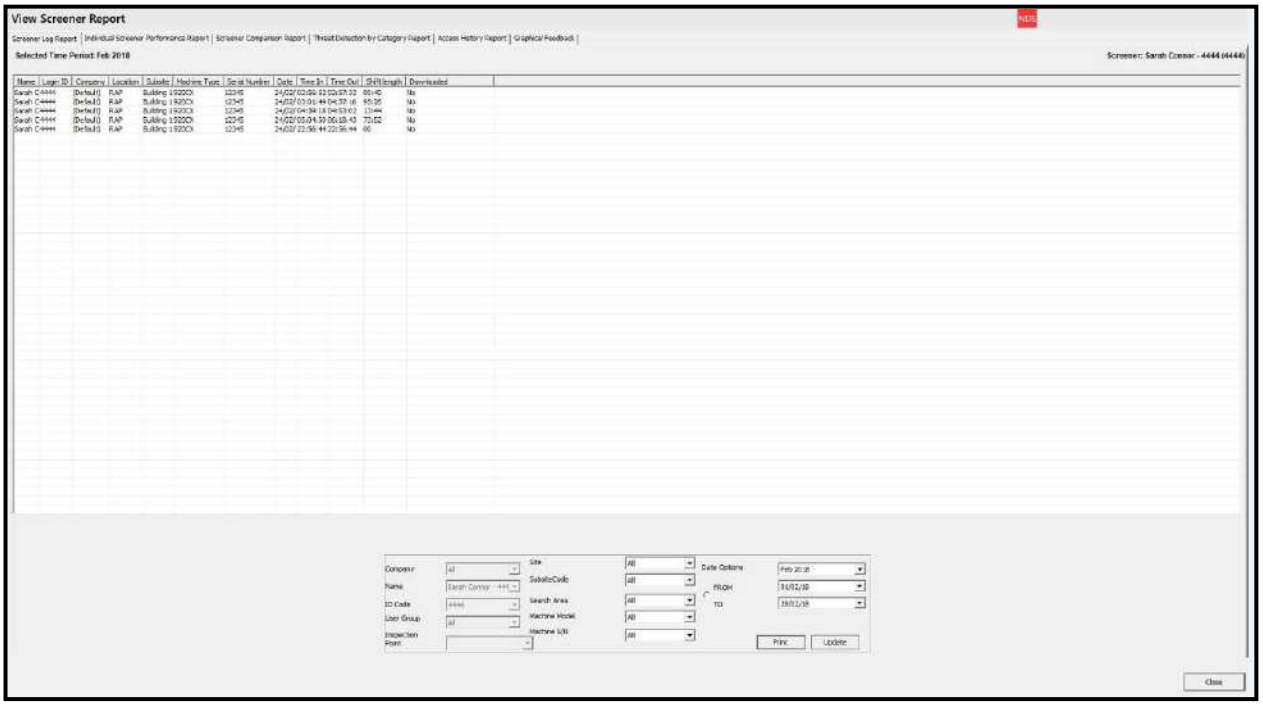



**Figure 87: View Screener Report - Screener Log Report (Example)**

## C.3.2 Target™ Bulk Explosive Detection System

### C.3.2.1 Target

**Target** is the optional feature which automatically detects and highlights potential bulk explosives threats by surrounding those threats with a red ellipse.

Interactive **Target (iTarget)** allows the operator to manually apply the Target algorithms to user selected areas/objects on the image to determine if the area/object is in fact a potential bulk explosive threat.

**NOTICE**

**The initial installation of these optional features within the ScanOS software enables both standard and interactive Target features by default.**

**When dangerous objects such as explosives, guns or other weapons are identified in the X-ray image as potential threats, follow the facility procedure to resolve such events.**

***AVIS***

***L'installation initiale de ces fonctionnalités facultatives dans le logiciel ScanOS permet par défaut les fonctionnalités cibles standard et interactives.***

***Lorsque des objets dangereux tels que des explosifs, des armes à feu ou d'autres armes sont identifiés dans l'image des rayons X comme des menaces potentielles, suivez la procédure de l'installation pour résoudre de tels événements***

### C.3.2.2 Interactive Target - Setup and User Operation

Interactive **Target** gives the Operator the ability to manually interact with the objects on the screen that are suspect to be a potential threat, and to request algorithm analysis on a user specified area.

Using the OCP, left click the mouse button and select **ITarget**. Once in **Interactive** mode, clicking the left mouse button on the OCP will perform **Interactive Target** detection at the cursor location, giving the Operator the ability to target a specific area on the image.

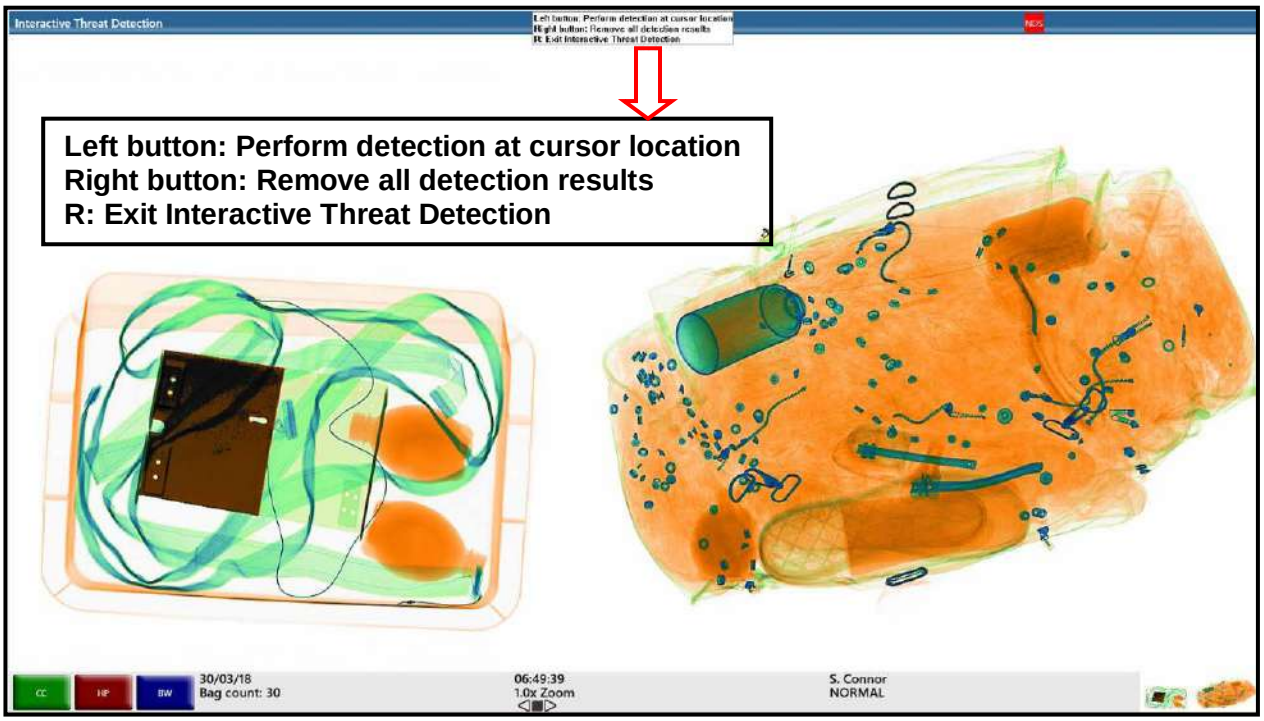



**Figure 88: Interactive Target**

If **Interactive Target** does not detect a threat, the following message appears to the operator:

**Area selected has not been identified as a potential threat.**

**Press the STOP button to continue.**

When **Interactive Target** detects a potential threat, a red ellipse will be drawn around the potential threat to bring it to the operator's attention.

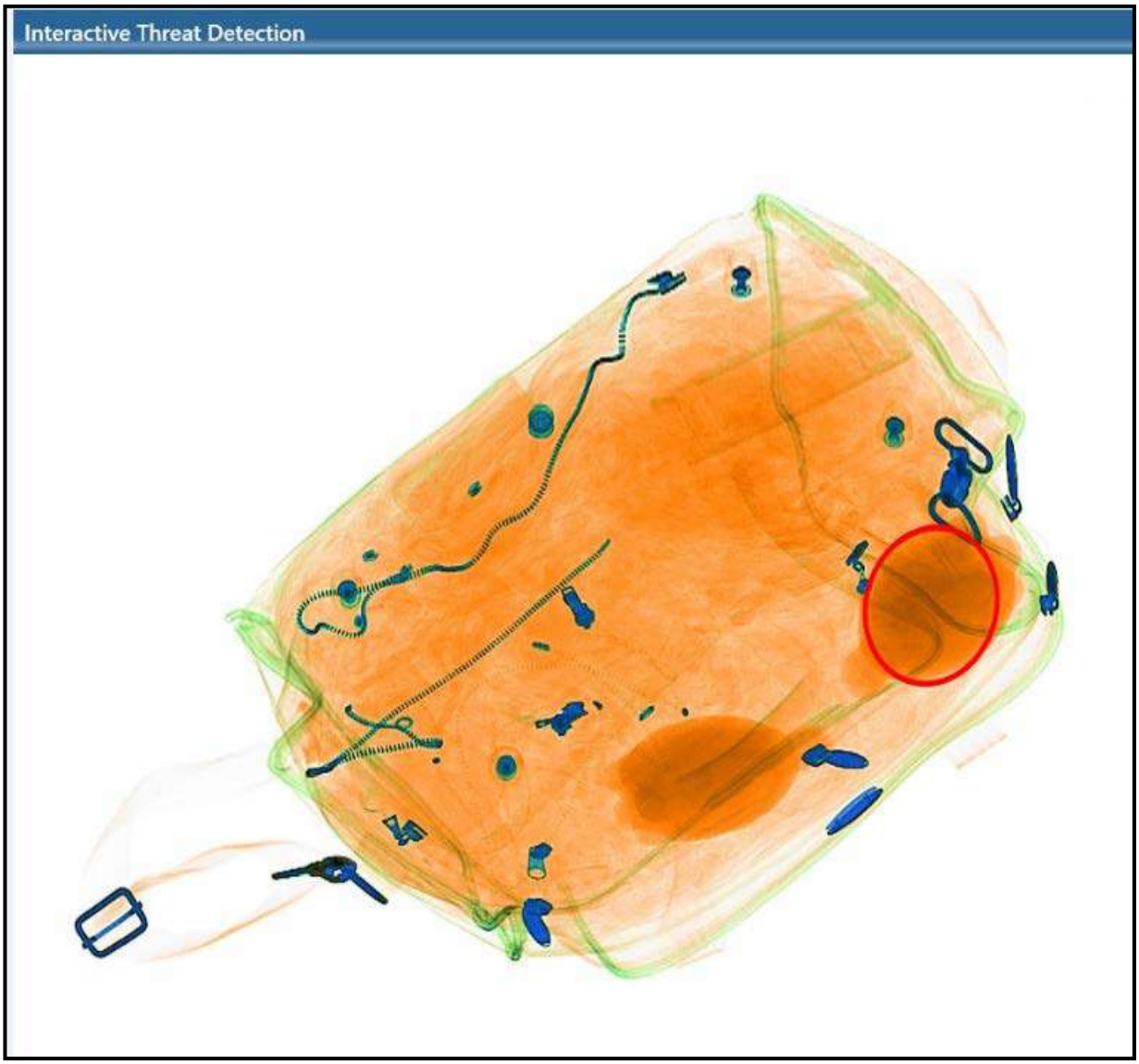



**Figure 89: Example of a Potential Threat**

The Operator can now decide whether to carry out a physical inspection of the tray or execute another security procedure that would normally be followed at that facility.

**⚠ WARNING**

**When dangerous objects such as explosives, guns or other weapons are identified in the X-ray image as potential threats, follow the procedure established at your facility to safely resolve such events.**

**AVERTISSEMENT**
***Lorsque des objets dangereux tels que des explosifs, des armes à feu ou d'autres armes sont identifiés dans l'image des rayons X comme des menaces potentielles, suivez la procédure établie à votre installation pour résoudre en toute sécurité de tels événements.***

### C.3.3 Density Threat Alert (DTA) Indicator

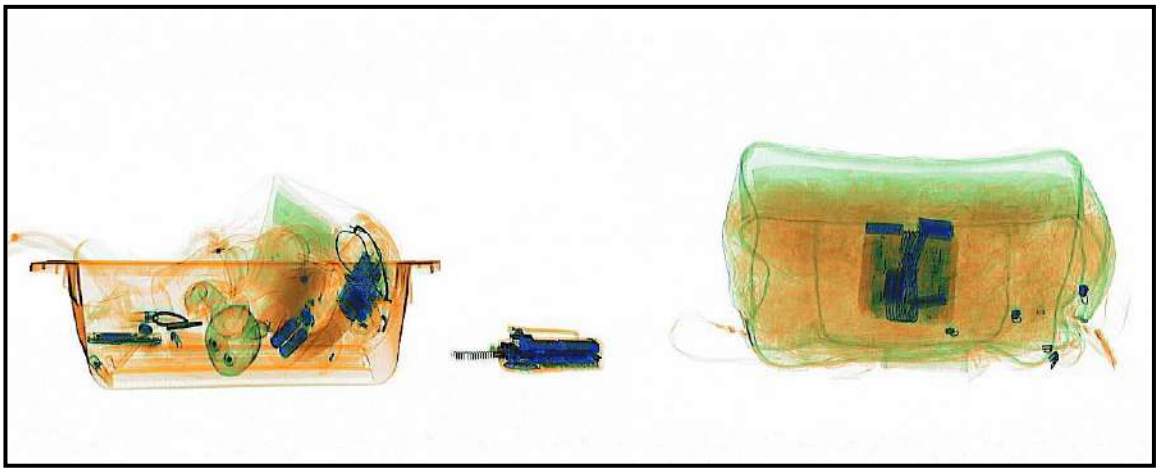


**Figure 90: DTA Inactive Flash**

If a scanned item has a higher density than the **DTA** threshold, a magenta color will flash over the areas of potential threat, (ref: Figure 91).

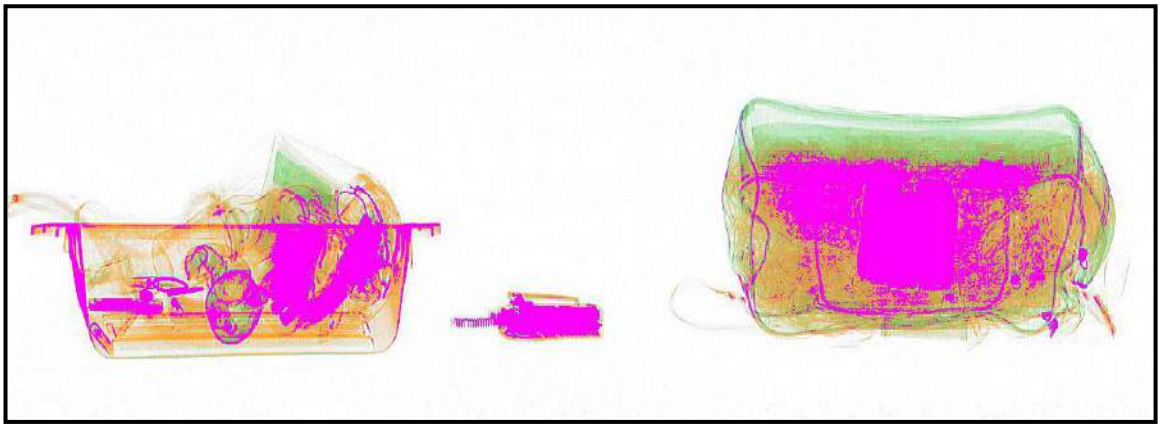


**Figure 91: DTA Active Flash**

### C.3.4 Narcotic Detection System (NarcScan)

**NarcScan** is the optional feature which automatically detects and highlights potential bulk narcotic threats by surrounding those threats with a blue circle.

NOTICE

**NarcScan** displays images of a potential bulk narcotics threat. As the trays are scanned in the X-ray machine tunnel, **NarcScan** detects potential threats and draws a blue circle around the potential threat as shown in Figure 92.

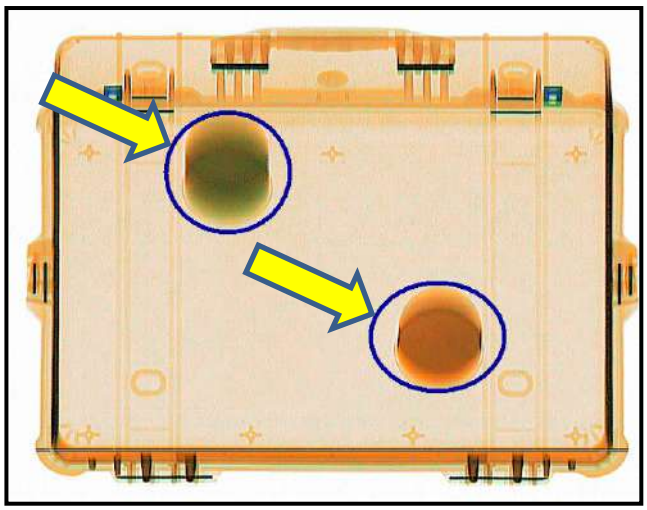


**Figure 92: Highlighted Potential NarcScan Threat**

NOTICE

When dangerous objects such as explosives, weapons, or narcotics are identified in the X-ray image as potential threats, follow the established facility site procedures.

The NarcScan Operation Test Kit (OTK) is described in *SECTION C.2.2 NARCSCAN OPERATIONAL TEST KIT (OTK)*.

### C.3.5 Operator Training Program (OTP)

The OTP is a software program that creates a virtual scanning environment for conducting initial and on-going training purposes. Previously scanned images scroll onto the user's screen as if the conveyor belt is moving baggage through the security X-ray machine's tunnels, but it is completely virtual, without conveyors moving or X-rays being generated.

The Operator is presented with scanned images from a library on the hard drive while random TIP projections are inserted and the system tracks his responses. The Operator can manipulate the images using the OCP enhancement keys as well as zooming and panning, archiving images, etc. All OCP keys operate as if the images on the screen were real instead of virtual.

Figure 93 displays an example of an OTP session where the previously scanned images of two bags have just scrolled onto the user's screen as if they were actually being moved into and through the X-ray tunnel.

The purpose of this program is to familiarize the user with the OCP layout and the functions of the individual image enhancement tools and function keys.

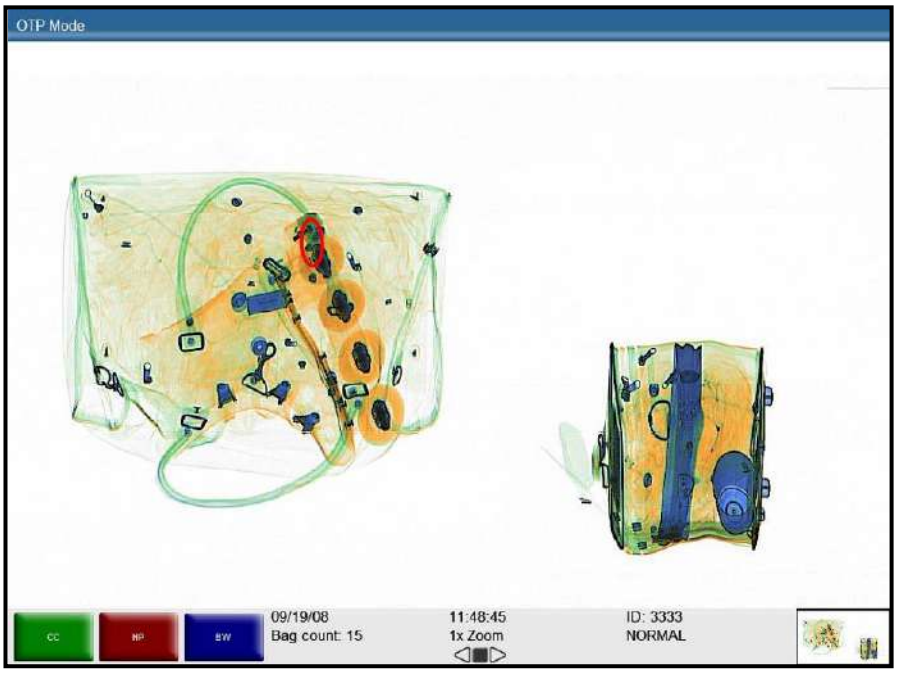



**Figure 93: OTP Mode**

### C.3.6 Network Display Station (NDS)

**NDS** is an optional **Screening Workstation** that supports secondary screening of bags at security sites. The **Multi-NDS** is an optional feature that connects multiple BPI X-ray Stations (i.e., Scanners) to one Search Station (i.e., **NDS**). Using the **Multi-NDS** network software, images scanned at multiple X-ray Stations can be selected, by annotation, bag marker or both depending upon the configuration, to transfer to the **NDS**. The **NDS** then displays the received images on the screen for secondary screening purposes.

Figure 94 shows an example of a Simple 3 x1 Networked Display Station. The **1** indicates the number of **NDS** available for remote viewing. The **3** indicates the number of scanners, all of which must be the same type. Due to monitor requirements, each **NDS** can only support one type of BPI X-ray scanner.

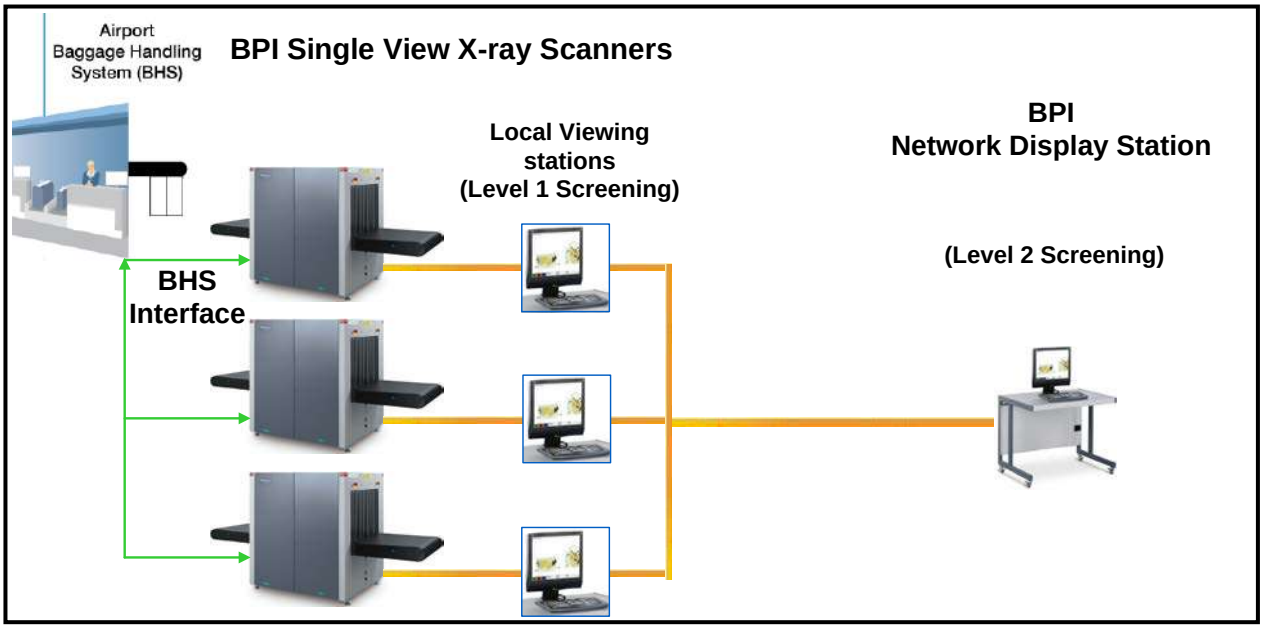



**Figure 94: Example of a 3x1 NDS Configuration**

#### C.3.6.1 NDS Operation

The **NDS** configuration is intended for use where the Local Operator needs to send a scanned X-ray image to a remote screener, who cannot be in the immediate baggage screening area, for additional threat review and annotation.

For example, the BPI X-ray Operator with an **NDS** configuration can send a copy of a suspicious image using the OCP. Then the **Operator** or **Supervisor** at the **NDS** could review the scanned image of a bag and recommend actions to the **Local Screener**, such as communicate security threats which require a manual search. **NDS** remote screening has many advantages including screener redundancy, training, and supervisory oversight.

**NOTICE**

**The NDS does not have its own key or Emergency Stop button. It can only review and annotate X-ray images that have been sent by a local viewing station. Only the local BPI X-ray Scanning station can shut down and startup it's associated BPI X-ray Scanner.**

**AVIS**

**La NDS n'a pas sa propre touche ou bouton d'arrêt d'urgence. Il ne peut examiner et annoter les images radiographiques qui ont été envoyées par une station de visualisation locale. Seule la station locale de balayage de rayons X BPI peut arrêter et démarrer son associé BPI X-ray scanner.**

### C.3.6.2 NDS Start-up Procedure

1. Verify the **NDS** is powered on by verifying that the monitors are displaying the **Logon Screen**, (ref Section 4.1.4.
2. Login with the appropriate credentials as described in Section 4.1.4.
3. The **NDS** is now ready to receive, review, and annotate X-ray images sent from the local BPI X-ray Scanning station.

### C.3.6.3 Transferring an Image

The **NDS** software can be used to highlight a potential threat within a section of the image scanned using **Annotation Mode.** The image can then be sent to the **Remote Viewing Workstation**.

The OCP is used to allow a Local Operator to highlight a potential threat and transfer the image of the suspicious bag, including the highlighted item, to the **NDS** that is located some distance away. The **Supervisor** or **NDS** Operator can then review the image and make an informed decision as to what type of threat, if any, the object represents. When the Local Operator highlights the suspicious item and sends it to the **NDS**, the **NDS** Operator knows what to look for and where the object is located in the scanned bag.

The Local Operator must first capture and annotate an image and then use the **Transfer to NDS** feature to send the image to the **NDS**.

1. Press the **SEARCH** (**SER**) button on the local X-ray OCP.
2. Press the **STOP** button on the OCP. A red rectangle will appear around one of the bag images.
3. Press the **SEARCH (SER)** button on the OCP to indicate that a potential threat has been found.
4. The Local Operator will see a message onscreen instructing then to use the **4** or **6** toggle keys to move the rectangle to the right or left to select the image you want to work with.
5. Press the **5** key on the OCP. The red crosshairs will appear over the bag image.
6. To annotate the area, use the OCP touchpad to move the crosshairs to the part of the bag that represents a possible threat. Then hold down the left touchpad key while moving the cursor using the touchpad. This will form a pink rectangle around the image.

Release the left touchpad when the entire area of interest is highlighted. Figure 95 shows an example of two potential threats highlighted on the local BPI X-ray scanning station.

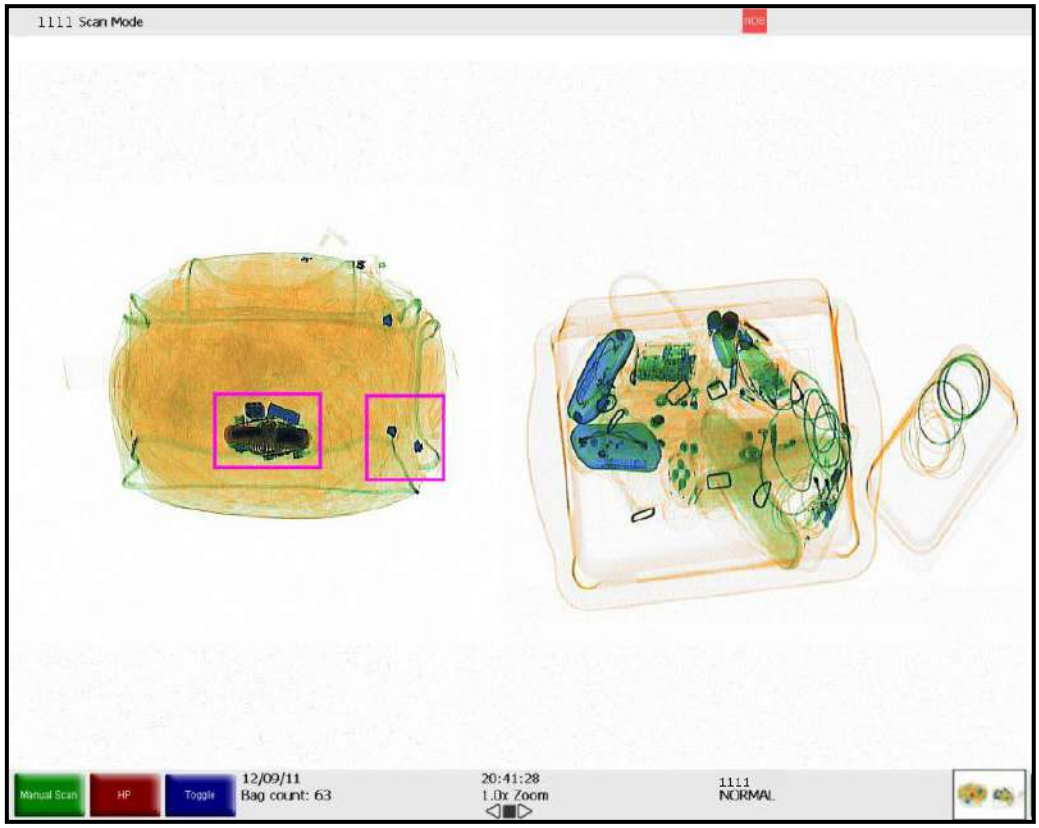



**Figure 95: Potential Threats Highlighted on Local Scanning Station**

**⚠ WARNING**

**When dangerous objects such as explosives, guns or other weapons are identified in the X-ray image as potential threats, follow the established site procedures to safely resolve such events.**

**AVERTISSEMENT**

**Lorsque des objets dangereux tels que des explosifs, des armes à feu ou d'autres armes sont identifiés dans l'image des rayons X comme des menaces potentielles, suivez les procédures de site établies pour résoudre en toute sécurité de tels événements.**

### C.3.6.4 Using the NDS

This section describes how the **Supervisor** or **Operator** at the **NDS** can use the **NDS** software to review potential threats received from multiple BPI X-ray Scanning Stations.

The OCP allows a Local Operator to highlight a potential threat and transfer the image of the suspicious bag, including the highlighted item, to the **NDS** located some distance away.

Once the **NDS** has received an image from a BPI X-ray Scanner, the **Supervisor** or **NDS** Operator can review the image for secondary screening purposes following their standard procedures.

After the image is sent to the **NDS**, it will be placed in the **Pending Images** queue. If multiple images are sent to the **NDS**, they will remain in the **Pending Images** queue until the **Supervisor/NDS** Operator reviews them or they expire.


**Figure 96: Potential Threats Highlighted on NDS**

1. If site procedures require, the **Supervisor/NDS** Operator can then contact the Local BPI X-ray Scanner Station Operator to verify that the annotations appear in the correct location.

**NOTICE**

**By clicking the Blue programmable OCP key, viewing of onscreen annotations can be toggled On and Off.**

***AVIS***

***En cliquant sur la touche bleue programmable OCP, l'affichage des annotations à l'écran peut être activé et désactivé.***

2. The **Supervisor/NDS** Operator can use all image processing features and software installed on the **NDS** exactly as defined by the X-ray Scanner's standard operating manual. Image processing analysis is available on this menu as well as **Help Manuals**, **Image Information**, **Machine Serial Number**, **Filter Options**, and **Export Images**.
3. If additional images are sent from the local BPI X-ray Scanning Station to the **NDS**, press the **Forward** button on the OCP to move to the next image.
4. If any images have not been viewed before the time limit expires, the **NDS** will display the **Expired Image** message box shown inFigure 97 instead of the image.

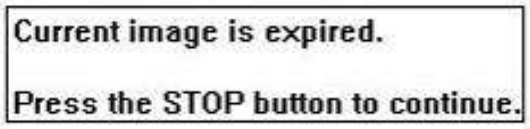



**Figure 97: Expired Image Message Box**

The indicator panel located at the top left corner of the NDS shown in Figure 98 displays the NDS image information listed in Table 11. In addition, NDS configurable image information is listed in Table 12.

**Table 11: NDS Image Information**

| NDS Screening Mode Information | | Description |
|---|---|---|
| 1 | Connections | Number of X-ray Scanning Stations that are currently connected to the NDS & capable of sending image files. |
| 2 | Pending Images | Number of images that are awaiting review, with a default maximum of 10 images. |
| 3 | Expired Images | Number of images that have been sent to the NDS but were not viewed within the maximum time limit or before the maximum number of pending images is reached. The default maximum time limit is 25 minutes. |
| Bag Image Information | | Description |
| 4 | Station | BPI X-ray Screening Station from which the current image was sent. |
| 5 | Operator ID | ID number of the Scanner/Operator logged in to the BPI X-ray Screening Station from which the current image was sent. |
| 6 | Bag Count | Actual bag count number according to the BPI X-ray Screening Station from which the current image was sent. |

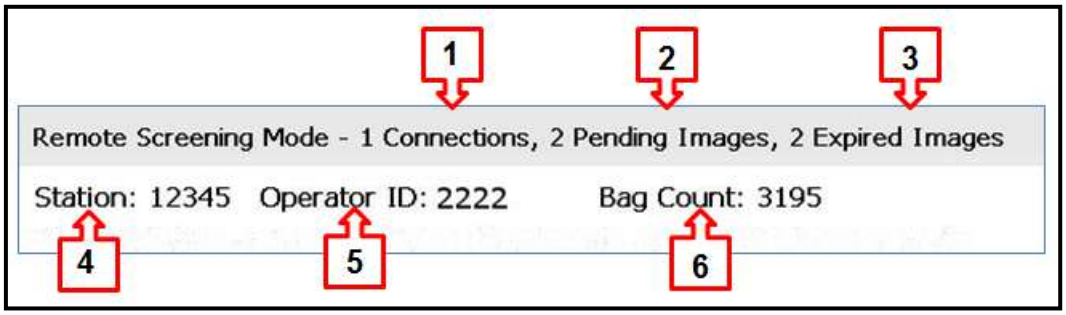



**Figure 98: NDS Indicator Panel**

**Table 12: NDS Configurable Image Information**

| Configurable Bag Image Information | Description |
|---|---|
| Operator Name | The name of the Operator logged in to the BPI X-ray Screening Station from which the current image was sent. |
| Company | Company name that the employs the Operator logged in to the BPI X-ray Screening Station |
| Sub-Site | The name of the Sub-Site location that houses the BPI X-ray Screening Station from which the current image was sent. |
| Machine Serial Number | The Machine Serial Number of the Station from which the current image was sent. |
| Machine Model Number | The Machine Model Number of the BPI X-ray Screening Station from which the current image was sent. |
| Date/Time | The date and time that the current image was sent to the NDS. |

### C.3.7 Manual Scan

1. Select **Manual Scan** from the **Screener Menu - Options**, (ref: Figure 78).


**Figure 99: Manual Scan**

2. Selecting **Manual Scan** allows the user to manually scan baggage. The operator uses this function to turn X-rays on and they remain on until the **ST (STOP)** button is pushed. This allows the user to bypass the photo sensors and allows for the scanning of oddly shaped baggage that normally might not trigger the photo sensors and X-ray generator. Figure 100 is an example of a **Manual Scan Mode** screen.


**Figure 100: Manual Scan Mode**

### C.3.8 Printer

1. Select Print, (ref: Figure 101) from the Screener Menu - Options, (ref: Figure 78).
2. If a **Print** button is available from a displayed screen, clicking the **Print** button allows printing of the displayed screen information to a network printer.


**Figure 101: Print Screen**

3. If printing an image, the selected image displays with a red box around the scanned image.
4. Press the **4** or **6** key to select the image to be printed.
5. Press the **5** key to confirm the selection. A **Print Succeeded** confirmation message displays briefly, and the image is printed on the selected printer.

### C.3.9 Smart Card

This optional feature allows the user to store their User ID information on a "Smart Card." This card is then inserted into the Smart Card reader and the login information automatically populates the Login User ID field on the opening screen

When Smart Card option is enabled and the supervisor has registered the Screener's Smart Card, the User has the option to log in manually or automatically by placing the Smart Card in the Reader.

### C.3.10 Network Archive Review (NAR)

**NAR** is an optional **Archive Review Workstation** that supports remote review of the image archives at security sites. The NAR feature connects the archive of multiple BPI X-ray Stations (i.e., Scanners) to one **Network Archive Review Station** (i.e., **NAR** Station). Using the NAR network software, images archived at multiple X-ray Stations can be saved on the network server, then selected and transferred to the **NAR** Station. The **NAR** then displays the selected archived images on the **Review Station** screen.

Figure 102 shows an example of a 3 x1 **Network Archive Review** configuration. The **1** indicates the number of **NAR** Stations available for remote viewing. The **3** indicates the number of scanners, all of which must be the same type. Due to monitor requirements, each NAR can only support one type of BPI X-ray scanner.

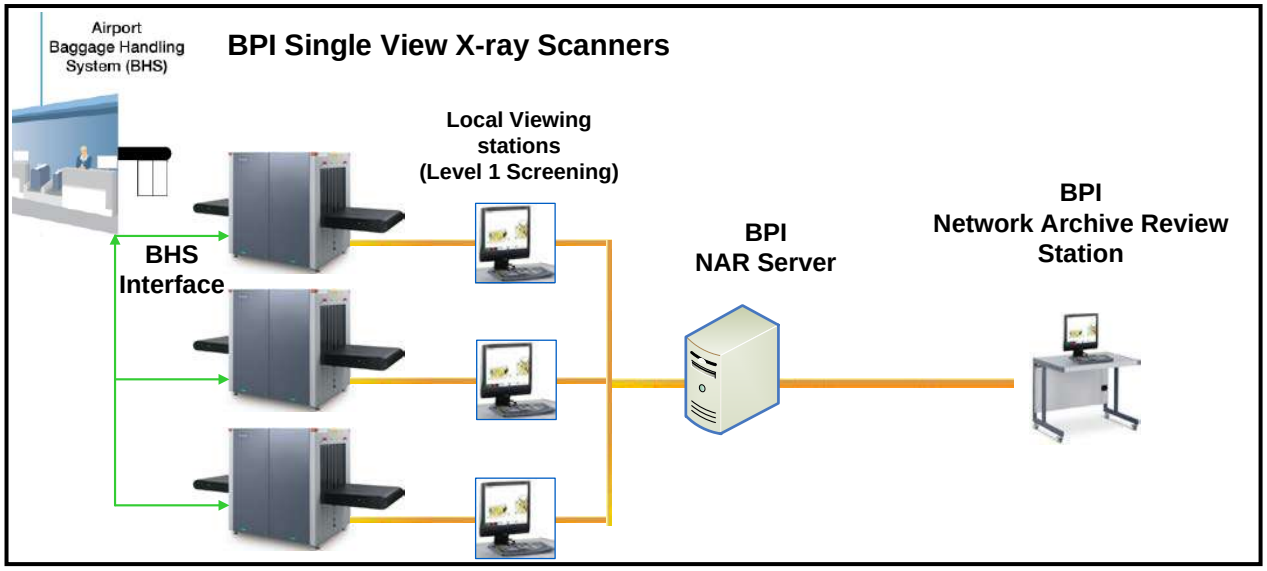



**Figure 102: Example of a NAR Configuration**

#### C.3.10.1 Network Archive Review (NAR) Operation

The **NAR** configuration is intended for use where the **Supervisor** wishes to review images that have been manually or automatically archived at multiple BPI X-ray screening stations. The **Manual Archive**, **Auto Archive**, and **Missed TIP Archives** for each BPI X-ray station in the **NAR** configuration are copied over to the **NAR Server** at predetermined time intervals and then available for secondary review at the **NAR Station**. In the standard **NAR** configuration, **Imported Archives** from individual BPI X-ray screening stations are not copied over to the **NAR Server**. **Network Archive Review** has many advantages including screener training and supervisory oversight.

NOTICE

**The NAR does not have its own key or Emergency Stop button. It can only review and annotate X-ray images that have been automatically or manually archived at the local viewing station. Only the local BPI X-ray Scanning station can shut down and startup it's associated BPI X-ray Scanner.**

***AVIS***

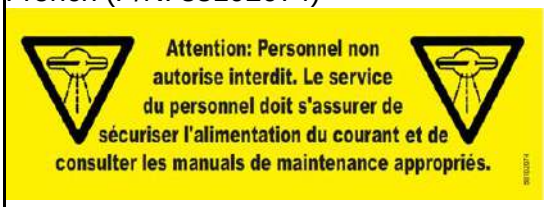
*Le NAR n'a pas sa propre touche ou bouton d'arrêt d'urgence. Il ne peut examiner et annoter les images radiographiques qui ont été automatiquement ou manuellement archivées à la station de visualisation locale. Seule la station locale de balayage de rayons X BPI peut arrêter et démarrer son associé BPI X-ray scanner.*

# APPENDIX D – CANADIAN LABEL KIT

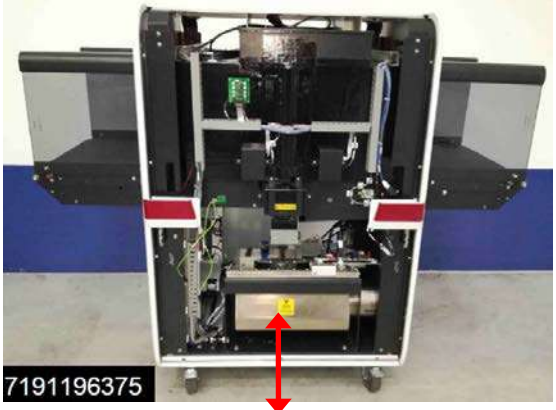
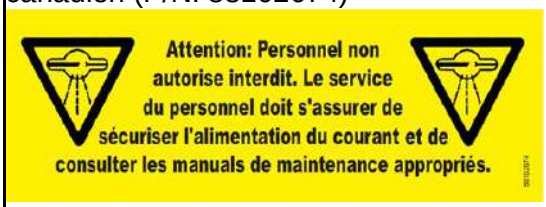
## D.1 X-ray Warning Labels on both Entry and Exit Tunnels

| Standard Machines | Machines to Canada |
|---|---|
|  <br>Above label (P/N: 101017837) is on both Entry and Exit Tunnels on the standard machines. For units built for Canada, this label will be replaced by 2 Canadian labels (P/N: 88102671 & P/N: 88102672) side by side on both Entry and Exit Tunnels), refer the column at the right. | For Machines built for Canada, the warning label (P/N: 101017837) will be replaced with 2 Canadian labels in both English & French (P/N: 88102671 & P/N: 88102672) side by side on both Entry and Exit Tunnels, see below for these 2 Canadian labels:<br><br>Label, X-ray Warning, Large, Canadian French (P/N: 88102671)<br>  <br>Label, X-ray Warning, Large, Canadian English (P/N: 88102672)<br>  |

## D.2 X-ray Warning Labels on Collimator Covers inside the machine

| Standard Machines | Machines to Canada |
|---|---|
|  <br>Above label (P/N: 88113311) is on the front & back collimator covers inside the standard machines. For machines built for Canada, this label will be replaced by 2 Canadian labels (P/N: 88102673 & P/N: 88102674) next to each other on the front & back collimator covers inside the machines, refer the column at the right. | For Machines built for Canada, the warning label (P/N: 88113311) will be replaced with 2 Canadian labels in both English & French (P/N: 88102673 & P/N: 88102674) next to each other on the front & back collimator covers inside the machines, see below for these 2 Canadian labels:<br><br>Label, X-ray Warning, Small, Canadian English (P/N: 88102673)<br>  <br>Label, X-ray Warning, Small, Canadian French (P/N: 88102674)<br>  |

## D.3 X-ray Warning Labels on the Generator Tank inside the machine

| Standard Machines | Machines to Canada |
|---|---|
|  <br>  <br>Above label (P/N: 243B2000-00) is on the generator tank inside the standard machines. For machines built for Canada, this label will be replaced by 2 Canadian labels (P/N: 88102673 & P/N: 88102674) next to each other on the generator tank inside the machines, refer the column at the right.<br><br>L'étiquette ci-dessus (P/N: 243B2000-00) est sur le réservoir du générateur à l'intérieur des machines standard. Pour les machines construites pour le Canada, cette étiquette sera remplacée par 2 étiquettes canadiennes (P/N: 88102673 & P/N: 88102674) à côté de l'autre sur le réservoir du générateur à l'intérieur des machines, référez-vous à la colonne à droite. | For Machines built for Canada, the warning label (P/N: 243B2000-00) will be replaced with 2 Canadian labels in both English & French (P/N: 88102673 & P/N: 88102674) on the generator tank inside the machines, see below for these 2 Canadian labels:<br><br>Pour les machines construites pour le Canada, l'étiquette d'avertissement (P/N: 243B2000-00) sera remplacée par 2 étiquettes canadiennes en Anglais & Français (P/N: 88102673 & P/N: 88102674) sur le réservoir du générateur à l'intérieur des machines, voir ci-dessous pour ces 2 étiquettes canadiennes:<br><br>Label, X-ray Warning, Small, Canadian English (P/N: 88102673)<br>Étiquette, avertissement de rayons X, petit, anglais canadien (P/N: 88102673)<br>  <br><br>Label, X-ray Warning, Small, Canadian French (P/N: 88102674)<br>Étiquette, alerte aux rayons X, petit, Français canadien (P/N: 88102674)<br>  |

## D.4 X-ray Warning Label on the Control Panel

| Standard Machines | Machines to Canada |
|---|---|
|  <br>  <br><br>Above label (P/N: 4014114) is on the operator control panel outside the machines. For machines built for Canada, this label will be replaced by 1pc Canadian labels (P/N: 88102675) on the operator control panel, refer the column at the right.<br><br>L'étiquette ci-dessus (P/N: 4014114) se trouve sur le panneau de commande de l'opérateur à l'extérieur des machines. Pour les machines construites pour le Canada, cette étiquette sera remplacée par 1pc étiquettes canadiennes (P/N: 88102675) sur le panneau de commande de l'opérateur, référez-vous à la colonne à droite. | For Machines built for Canada, the warning label (P/N: 4014114) on the operator control panel will be replaced with 1pc Canadian label in both English & French (P/N: 88102675), see below for this Canadian label:<br><br>Pour les machines construites pour le Canada, l'étiquette d'avertissement (P/N: 4014114) sur le panneau de commande de l'opérateur sera remplacée par une étiquette canadienne 1pc en Anglais & Français (P/N: 88102675), voir ci-dessous pour ce label canadien:<br><br>Label, X-ray Warning, White, Canadian (P/N: 88102675)<br>Étiquette, avertissement de rayons X, blanc, canadien (P/N: 88102675)<br>  <br><br><br>Note: it shall be placed on the operators side of the cabinet and as close as possible and just above the operators control panel. Label is not to be placed on control panel in the event the control is changed out.<br>Note: il doit être placé du côté des opérateurs de l'armoire et aussi près que possible et juste au-dessus du panneau de commande des opérateurs. L'étiquette ne doit pas être placée sur le panneau de commande dans le cas où la commande est change. |

## D.5 Keep off of Conveyor Warning Labels on 928DX

| Standard Machines | Machines to Canada |
|---|---|
|  <br>  <br>Above label (P/N: 101024974) is on the low conveyor on 928DX machines. For machines built for Canada, this label will be replaced by 2 Canadian labels (P/N: 101024975 & P/N: 101024976) next to each other on the low conveyor on 928DX machines, refer the column at the right.<br><br>L'étiquette ci-dessus (P/N: 101024974) est sur le convoyeur bas sur les machines 928DX. Pour les machines construites pour le Canada, cette étiquette sera remplacée par 2 étiquettes canadiennes (P/N: 101024975 & P/N: 101024976) à côté de l'autre sur le convoyeur bas sur les machines 928DX, référez-vous à la colonne à droite. | For Machines built for Canada, the warning label (P/N: 101024974) will be replaced with 2 Canadian labels in both English & French (P/N: 101024975 & P/N: 101024976) on the low conveyor on 928DX machines, see below for these 2 Canadian labels:<br><br>Pour les machines construites pour le Canada, l'étiquette d'avertissement (P/N: 101024974) sera remplacée par 2 étiquettes canadiennes en Anglais & Français (P/N: 101024975 & P/N: 101024976) sur le convoyeur bas sur les machines 928DX, voir ci-dessous pour ces 2 étiquettes canadiennes:<br><br>Label, Keep Off of Conveyor Warning, Canadian English (P/N: 101024975)<br><br>Étiquette, garder hors de l'avertissement de convoyeur, anglais canadien (P/N: 101024975)<br>  <br>Label, Keep Off of Conveyor Warning, Canadian French (P/N: 101024976)<br><br>Étiquette, garder hors de l'avertissement de convoyeur, Français canadien (P/N: 101024976)<br>  |

# APPENDIX E - CONTACT INFORMATION

## E.1 Customer Service and Support

### The Americas and Caribbean

| | |
|---|---|
| Telephone: | +1-310-349-2477 |
| Toll Free: | +1-888-258-6684 |
| Canada Toll Free: | +1800-335-6274 |
| E-Mail: | RapCSCallCenter@rapiscansystems.com |

### Europe, Middle East, and Africa

| | |
|---|---|
| Telephone | +44-0-9707-774301 |
| E-Mail: | RSPUK-AllService@rapiscansystems.com |
| E-Mail: | Rapmeso@ rapiscansystems.com |

### Australia, Malaysia, New Zeeland, and Philippines

| | |
|---|---|
| Telephone: | 800-456-08560 |

### Indonesia

| | |
|---|---|
| Telephone: | 001803-017-3884 |

### Vietnam

| | |
|---|---|
| Telephone: | 122-80-308 |

### UAE

| | |
|---|---|
| Telephone: | 800-017-6865 |

## E.2 Sales Offices

### United States of America

Rapiscan Systems, Inc.
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