InnerSpace®
Engineering space from the inside out.™
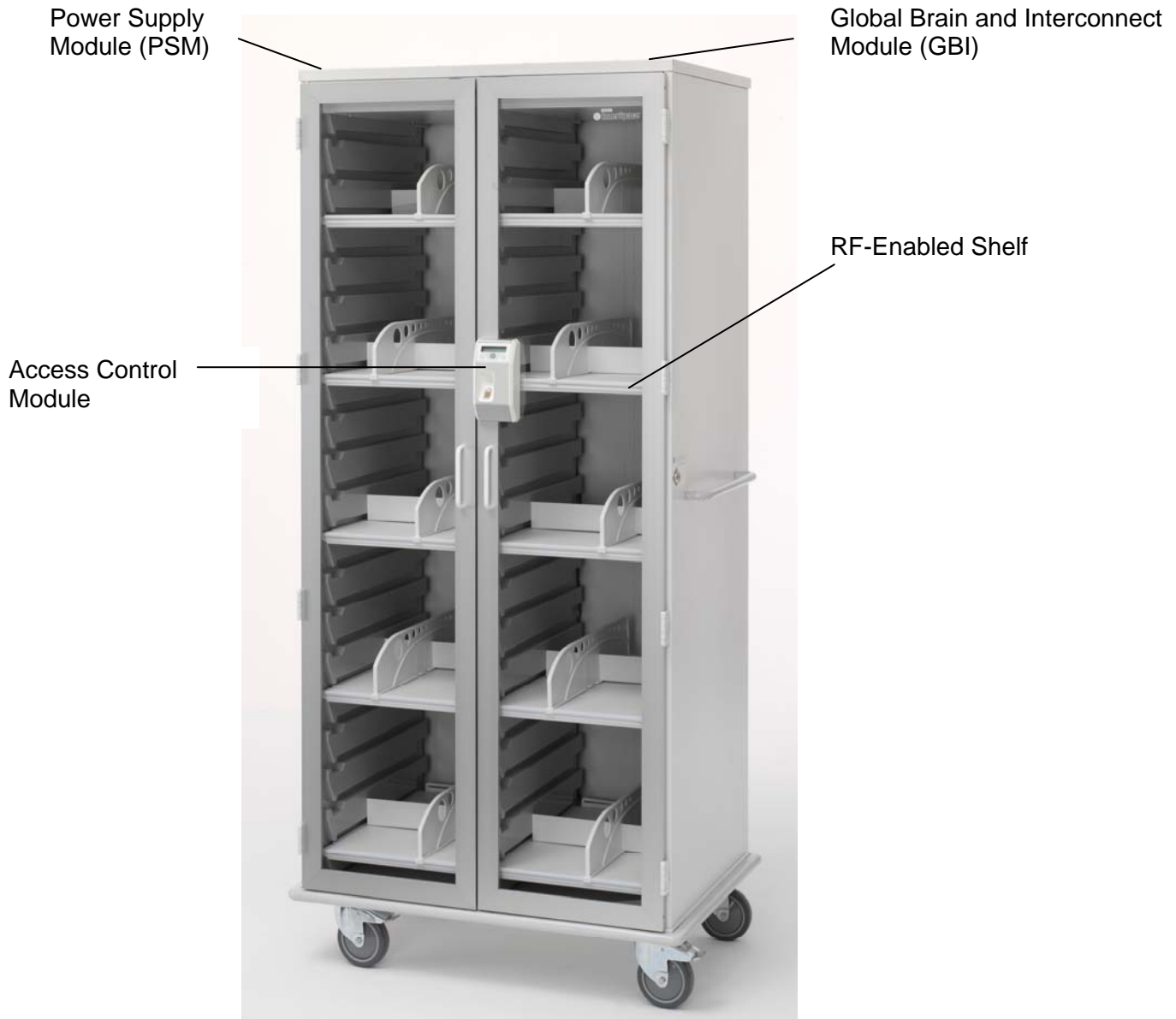
System 100
User Guide

Publication No. SYUG-1

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SYSTEM 100 USER GUIDE

Thank you for selecting InnerSpace's System 100™ to secure, track and manage your high cost clinical supplies. System 100 consists of a cart with integrated RFID technology and biometric access control, an enrollment station, a hand-held RFID reader, a hand-held barcode scanner, RFID tags and a web-based information engine (marketed under the brand name spaceTRAX®).

Access to the cart is controlled and monitored via a biometric security system. RFID tags are affixed to the outside package of clinical supplies and linked with the item's barcode. RFID antennae embedded in the cart's shelves are constantly communicating with the RFID tags to track the disposition, location, and expiration date of supplies. Coupling biometric security and RFID technology connects the "Who", "What", "When" and "Where" which are essential elements in achieving 100% charge capture.

Power Supply
Module (PSM)

Global Brain and Interconnect
Module (GBI)

RF-Enabled Shelf

Access Control
Module

1.0 Power

1.1 Plugging in the Cart

- Recessed IEC C-14 connector located on the top, rear of the cart
- 15' (457.2 cm) power cord and cord wrap
- Requires an 100-240 VAC 50-60Hz electrical outlet
- The LCD screen on the Access Control Module will read "ready" when cart has power
- Power Supply Module is located at the top of the cart beneath the access panel to the left of the global brain and interconnect. Note that only service personnel should have access to this area and this should not be accessed by the general public. Always disconnect AC power cord prior to removing access panel.

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1.2 Back-Up Battery

- LCD will show text message indicating the cart is running on battery power
- Allows the cart to be unplugged and moved without loss of information or security
- Housed under the top access panel. Note that only service personnel should have access to this area and this should not be accessed by the general public. Always disconnect AC power cord prior to removing access panel.
- Life expectancy is 3 years and can operate the cart for a maximum of 3 hours
- Recharging the battery takes 18 hours (from fully discharged)
- A rocker switch on the back, upper right-hand section of the cart turns the back-up battery on and off. Note that this switch disconnects the DC voltages from the GBI and leaves the AC power active.

AC Power Connector

ON

OFF
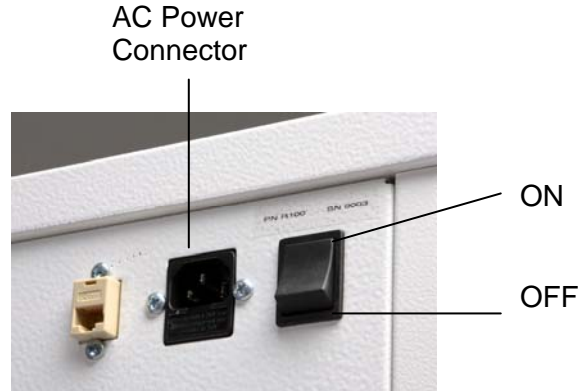
- In the event that the battery completely discharges, the cart will unlock. This means the cart will no longer scan and will be unlocked
- To replace the battery, remove the top access panel and remove the battery which is secured by Velcro straps. Note that only service personnel should have access to this area and this should not be performed by the general public. Always disconnect AC power cord prior to removing access panel.

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Back-up battery

1.3 Replacing Fuses

- Always disconnect AC power cord prior to replacing fuses.

- Fuses are located in two areas. a) Below the AC Power Connector (shown below) and b) In the Power Supply Module

Replacing AC Power Connector Fuses
- A quantity of two (2) AC power fuses is located in the slide-out compartment below the female power connector. Remove the black cover to gain access to the fuses and replace them with Fast Acting, 250V 3Amp (5mm x 20mm) fuses manufactured by Bussmann (Part# GMA-3-R) or an equivalent supplier.

Remove to expose fuses

- To replace the battery fuse located on the Power Supply Module remove the access panel located on the top of the cart. Note that only service personnel should have access to this area and this should not be performed by the general public. Always disconnect AC power cord prior to removing access panel.
- The fuse is located in a fuse holder that is connected to the positive terminal of the battery (FUSE BLADE 10A 32V ATO FAST-ACT, Mfg: Littelfuse, Part# 0257010.PXPV).

2.0 RFID and Inventory Devices

2.1 Barcode Scanner
- Reads the UPC barcodes from the inventory and sends the information thru the network to spaceTRAX

2.2 RFID Tags
- High frequency, passive RFID tags are to be affixed to the bottom of the inventory item so that they will be read by the shelf
- One tag is required per item.
- Additional RFID tags can be ordered at any time

2.3 Network Connectivity
- Ethernet port 10/100 base-T, RJ-45 connector located on the top rear of the cart adjacent to the power connector
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AC Power
Connector

Ethernet Port
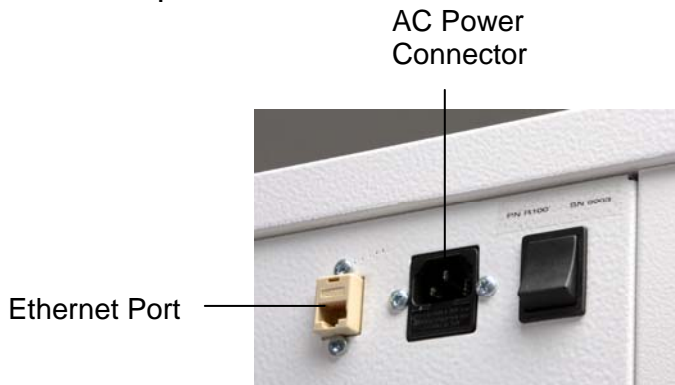
2.4 Read Performance
- 100% read performance when the tag on the bottom of the product is parallel with the shelf, using the pre-approved tag models and non-metallic packaging

2.5 Scan Interval
- Doors must be closed for scan of RFID tags to occur
- Depending upon the number of items, the cart can take up to 5 minutes to complete a full scan
- A new scan is always triggered by closing the cart door
- Should the door open during a scan, the scan will forcibly conclude

2.6 RF-Enabled Shelves
- Each shelf has a single RJ-45 port for connection to the Global Brain (GBI) module via a shielded CAT 5E cable
- Shelves can be repositioned in the field. With the power off, the user can reposition shelves as well as add shelves.
- Standard carts come with ten (10) shelves each with one divider. The maximum number of shelves per cart is sixteen (16).

2.7 Global Brain and Interconnect (GBI)
- Located at the top of the cart beneath the access panel is a tamper-proof white box with black handles on both sides. Note that only service personnel should have access to this area and this should not be accessed by the general public. Always disconnect AC power cord prior to removing access panel. There are several port connections on the GBI (AC+ battery status, door sensors, lock module, access control module, key switch, shelves, network, USB, and DC 12V)
- All connections are quick-disconnect type and are keyed for ease in serviceability
- Accessed by a removable enclosure panel (removal of two screws required to move the panel)

3.0 Security/Access Controls

3.1 Key Lock
- Standard key lock on every cart
- Serves as an emergency manual override
- Three setting: locked, open and auto. Carts in the locked mode can not be opened with out the key. Carts in the open mode are not locked and can be opened freely. Carts in the auto lock mode are controlled by the Access Control Module (ACM)
- Lock Module is located at the top of the cart near in front of the GBI

3.2 Access Control Module (ACM)
- Located on the front right door and attached with four screws
- Uses an embedded fingerprint identification system
- Maximum storage capacity is 188 fingerprint templates

- LCD display has back lighting to enhance viewing. Menu and select buttons are for local information and diagnostics.
- Allows access to the cart when an enrolled (i.e., authorized) user places their finger on the ACM reader. Non-enrolled individuals are denied access to the cart.
- To properly function, the key lock must to be set to the auto position
- Reports access log to spaceTRAX indicating the individual that accessed the cart and the time that the doors opened and closed.

3.3 Door Sensing
- Door movement (opening and closing) is monitored by door sensors.

4.0 Communications

4.1 Menu Screen on Access Control Module
- Diagnostics for serviceability

5.0 Centralized Data Collection and Reporting

5.1 Software Interface
- RFID carts use the same interface as spaceTRAX v2.0 – refer to the spaceTRAX v2.0 User Guide.

5.2 Network
- Network can be static or dynamic IP and is customer-specified and pre-programmed with the default setting as dynamic.
- Network proxy settings are pre-programmed and customer-specified

5.3 Configuration
- Cart configuration is done prior to shipping. Any remaining preferences are set during initial implementation and in conjunction with the hospital's IT staff.

6.0 Cart Status and Diagnostics

6.1 Warranty
- The cart components are serviced as needed under the lease agreement

6.2 Error Rectification
- In the event of an error, the four major technological components of the cart are designed to be easily removed for return to InnerSpace
- A replacement item will be shipped as soon as possible (normally within a 24 hour time period). "IMPORTANT NOTE: Components described below should be installed by service personnel only.
- To remove the ACM open the door of the cart and remove the four screws securing the module to the door. Ship entire module back to InnerSpace
- To remove the GBI open the top access panel (loosen two screws on top and slide the panel off the top of the cart), remove four thumbscrews at GBI corners, unattached all cables from the ports, lift the GBI module out of the cart using the two side handles. There should be no need to open the GBI itself, simply ship it in its entirety back to InnerSpace. Note that only service personnel should have access to this area and this should not be performed by the general public. Always disconnect AC power cord prior to removing access panel.
- To remove the PSM or Lock module open the top access panel and remove from the cart. Note that only service personnel should have access to this area and this should not be performed by the general public. Always disconnect AC power cord prior to removing access panel.
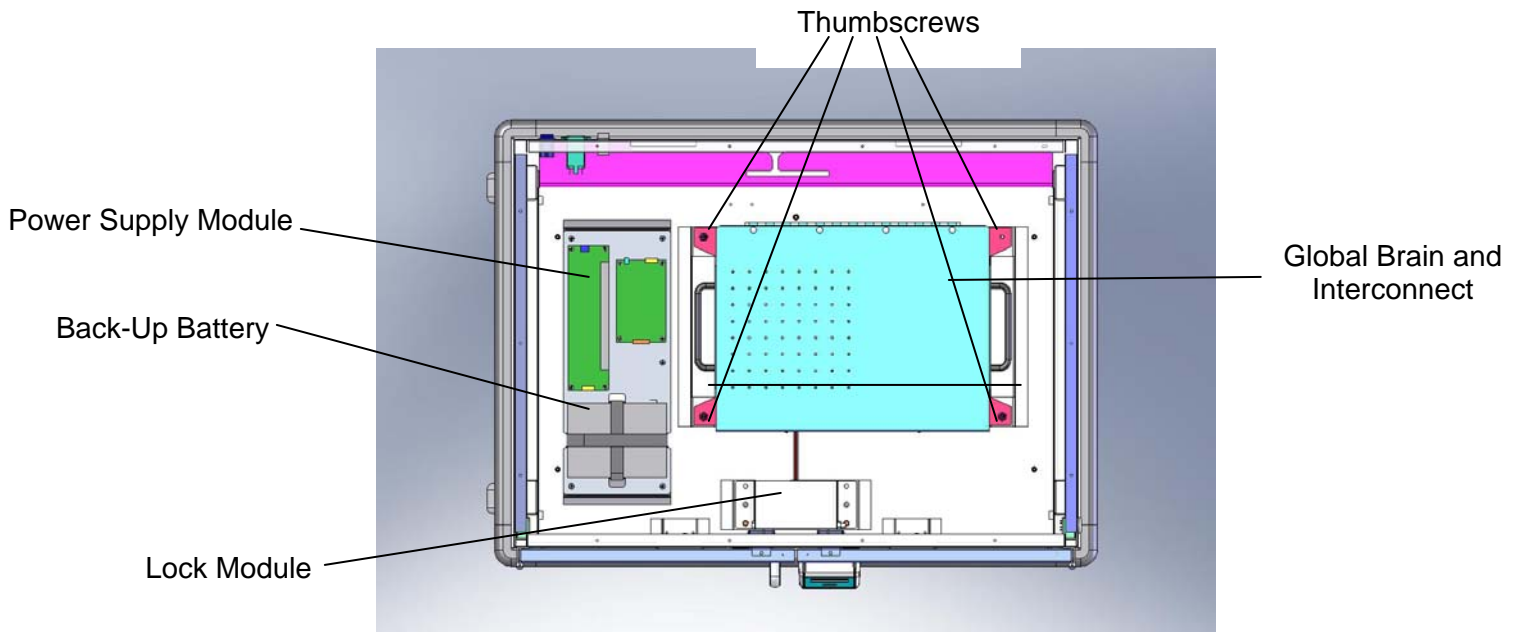
Top View of System 100 Cart

6.3 RF-Enabled Shelves
- Versatile within the cart.
- Carts come standard with 10 shelves but are capable of accepting up to 16 shelves.
- Each shelf has a RJ45 to connect to the back of the cart.
- To reconfigure shelves, pull out and unhook the connection, place shelf in desired location and reconnect. Each shelf is connected to the RJ45, 16 port jack on the upper back of the cart using a shielded Cat 5E cable.

7.0 spaceTRAX Information Engine
    7.1 RFID Tags
- System 100 RFID tags are small, adhesive backed tags that fit easily on the outside package of most high-cost clinical supplies such as drug eluting stents, ICDs, heart valves, orthopedic implants, implantable pain stimulators and etc.
- System 100 utilizes a technology that requires passive high frequency RFID tags. Passive tags do not require a power source or battery as they derive their energy from the RFID reader.
- Avoid contact with strong electromagnetic fields (MRI), do not crumple or tear RFID tags.

    7.2 Applying and Associating RFID Tags
- Apply the RFID tags to the side of the item that will have direct contact with the shelf.
- There are two ways of associating items with RFID tags. The first is the most common; when an item is added to the system and has the "RFID Required" box checked, the normal 'Add' process will prompt for an RFID tag after the barcode scan. Reading the RFID tag at that point will associate the unique .
- The second way of associating items is after they have already been added. Navigate to the item summary for the item and go into the current inventory tab, then click on the 'Details' link. Click 'Add New' in the menu, fill in the details, and then scan the new tag to associate it.
- If at any time an RFID tag gets lost, broken, torn, or in any other way malfunctions use the second method of adding an RFID tag to replace the missing and/or malfunctioning tag.

    7.3 Adding/Removing Tagged Items
- Place the package so that the RFID tag is within 3 inches of the shelf. Make sure not to block the 'line of sight' for the radio signal by covering the tag with metal, foil or liquid barriers. This includes stacking items that use any of the aforementioned barriers as packaging.
- All items removed from the cart are tracked automatically by communication between the RFID reader, antenna array and RFID tags.
- No additional procedures are required when returning an unused tagged item to the cart, the system will reconcile the inventory automatically. **Make sure that ALL items that are removed from the carts are either used or are replaced in a timely fashion. Failure to do so will leave the system unable to reconcile the missing items.**
- Assigning used (tagged) items to a patient or case is exactly the same as adding a non-RFID item. The only thing to remain aware of is that for 100% accuracy in your inventory it is important that RFID items be scanned out with an RFID scanner and not a barcode scanner. While barcode scanners will work, the uniqueness of the RFID tags makes them much more reliable in accurately tracking inventory.

    7.4 Available Reports
- An RFID report called 'RFID Summary' will be available in the spaceTRAX website that will track the cart contents, missing items, any unassociated items, and general cart usage.

7.5 Enrolling Authorized Users
- Use the enrollment device to scan each cart user's fingerprint once. After the scan the fingerprint is transformed into a non-reconstitutable mathematical algorithm that acts as the unique identifier for that person. The fingerprints are not stored anywhere in the network, nor will they be broadcast anywhere to or from the carts. The cart fingerprint readers match the print to the algorithm, not a map of the print itself.
- To capture the user's fingerprint navigate to Settings → Organization → Users and click on the triangle next to 'Details'. Click 'Fingerprints', then 'Add New', when the new dialog box opens, type a description for the print and then scan the user's print in using the enrollment device.
- To add enrolled users to the carts, navigate to the RFID cart you wish to add to, open it, and click on 'Users'. A list of printed users will appear, simply follow the process to add that user as an authorized user on the cart.

7.6 Deactivating Authorized Users
- To remove enrolled users from the cart, navigate to the RFID cart you wish to remove from, open it, and click on 'Users'. A list of users associated with the cart will appear, simply click on the triangle next to 'Details' and click 'Delete' to remove the user.

8.0 Notes to the Customer

NOTE: Changes or modifications not expressly approved by the manufacture could void the user's authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause interference in which case the user will be required to correct the interference at his own expense.

Industry Canada Warnings

RSS-GEN 7.1.4 Transmitter Antenna:

"A transmitter can only be sold or operated with antennas with which it was certified." The antenna provided with the System 100 is the ONLY antenna certified for use. No other antennas may be used with this system.

RSS-GEN 7.1.5 User Manual:

"Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device."

ADDITIONAL NOTE: The installer of this radio equipment must ensure that the antenna is located or pointed such that it does not emit RF field in excess of Health Canada limits for the general population; consult Safety Code 6, obtainable from Health Canada's website www.hcsc.gc.ca/rpb

NOTE: Always disconnect AC power cord prior to removing access panel. Note that only service personnel should have access to this area and this should not be performed by the general public.

WARNING

DO NOT OPEN THIS ACCESS PANEL UNLESS THE POWER CORD IS UNPLUGGED AND THE BATTERY BACKUP SWITCH IS IN THE OFF POSITION