Remote Presence

RP-VITA™ Reference Manual

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P/N: MA-20016-001

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Remote Presence System Overview

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The Remote Presence System is a mobile, TeleMedicine platform that enables an individual to “be in two places at once.” Remote Presence is the ability to project yourself to another location (without leaving your current location) and to move, see, hear, and talk as though you were actually there. A Remote Presence System is comprised of a ControlStation and a Remote Presence (RP) Device. The ControlStation and RP Device are linked via the Internet over a secure broadband connection.

The family of Remote Presence Systems includes the RP-VITA™ which combines various sensor technologies with its map-based navigation capability to provide AutoDRIVE to destinations within its allowed regions. The RP-7® Endpoint which under the manual control of a ControlStation operator, may roam untethered via an 802.11 wireless network. In addition, the cart based RP-Lite®, the OR based RP-Vantage®, and the RP-Xpress® which offers a portable form factor for flexibility, enable physicians to extend their reach into a broad array of uses ranging from transport, emergency, clinic, and more.

While seated at a ControlStation an individual can access the RP Device to visit people in another location. A physician can call on a patient, family members, and other staff. The RP Device’s two-way audio and video communications allow a user to be remotely available at the point of interaction whenever they are needed.

To ensure proper operation, users should be thoroughly familiar with their Remote Presence System. Study of this Reference Manual is essential. In addition, completion of proper training by an InTouch Health Representative is required for safe operation. All questions should be referred to your local InTouch Health Representative or InTouch Health Technical Service. **Failure to comply with the instructions in this manual may void the ControlStation warranty.**

Recommended Guidelines For HIPAA Compliance

The Remote Presence System allows hospitals and medical professionals to remain in compliance with HIPAA privacy regulations. InTouch Health is providing the following information to assist with HIPAA privacy regulations as they pertain to the Remote Presence System.

HIPAA requires all healthcare organizations to have policies and procedures, and the guidelines below may not cover all situations as they apply to a specific organization. Further, from time to time automatic software upgrades may be downloaded which may contain new features. InTouch Health will inform users of significant features as they are added, and the impact of these features and how they may affect HIPAA policies, procedures, and safeguards should be considered.

Access to ControlStation

The ControlStation should be placed in a location that is only accessible to individuals who have authorized access to Protected Health Information (PHI). It is recommended that ControlStation access is password protected via Windows user account control and the ControlStation password feature. Only authorized users should have passwords, and users should safeguard passwords according to hospital policies and procedures.

All users should be trained to log out of Windows or the Virtual Private Network (VPN), when away from the system for any period of time. This is important for security reasons, so that any person attempting access to the ControlStation will be required to enter a password for secure access.

Finally, the ControlStation screen should be positioned to point away from public areas, so as not to be visible to passersby.

Discussion and display of PHI

From time to time a physician will likely engage in remote communications with patients and medical staff in which patient information (records, images and video) will be discussed or displayed. In general, the same care should be exercised as though the physician were physically present. For example:

- Use the RP-VITA Head rotation to look around and see who else is nearby and might see or hear the sensitive information, and use appropriate discretion.
- Use the microphone mute button when conversing with someone alongside the ControlStation to avoid the inadvertent conferencing of patient-related conversation.

Stored images and video files

For convenience, all captured images and video files may be saved in common formats, e.g., JPEG for still images. These files are stored on the ControlStation hard drive, and therefore are accessible to any authorized user of the ControlStation. As such, there are a few recommended techniques for safeguarding PHI contained in these images and video.

- Ensure all personnel who have access to the ControlStation also have full permission to access stored images and videos under the hospital's policies and procedures; OR
- Make sure to store captured images and videos only on removable media (e.g., recordable CD-ROMs) which can be taken with each user; OR
- Do not save to disk any captured images and video clips. Use these images and video segments only while logged in for a particular session.

Disclosure of PHI

If the physician plans to transmit or copy stored images or video to other individuals or organizations, e.g., to a healthcare operator, the physician needs to abide by standard HIPAA codes governing who may receive PHI and under what conditions. The hospital's HIPAA compliance officer should be consulted for details.

User Profile

Trained health care professionals are the intended users of the RP-VITA. Users of the system require clinical judgment and experience to review and interpret the patient data transmitted by the system.

Notes, Cautions and Warnings

Pertinent information in **boldfaced type** can be found throughout this Reference Manual and should be interpreted in the following context:

Note: Provides supplementary information for facilitating operation of the system.

Caution: **Presents instructions for avoiding damage to the system.**

Warning: **Disregarding this information may prove hazardous to the safety of a person near the RP-VITA.**

Safety Symbols

Symbols appearing on labels on the RP-VITA and/or on the RP Dock include the following:

- Attention—Consult accompanying documents for a description of intended use.

- Warning Dangerous Voltage—Touching exposed contacts may cause electrical shock. Safety features designed into device do not allow exposed live AC contacts until RP-VITA is fully engaged with docking station. When fully engaged, contacts are not accessible.

- Wireless Transmitter Notification—Non-ionizing electromagnetic radiation. This device communicates over the 802.11a/b/g/n standard for wireless communication.

- Consult accompanying documents. Operating Instructions are contained in a separate instruction manual.

- The RP-VITA utilizes a Class II Laser which complies with 21 CFR Chapter 1, subchapter j. Maximum Laser radiation output is less than one milliWatt at a wavelength of 635 nanometers.
DO NOT STARE INTO THE LASER BEAM.

Caution: **Dazzle, flash-blindness, and afterimages may be caused by a beam from a Class II laser product, particularly under low ambient light conditions. This may have indirect general safety implications resulting from temporary disturbance of vision or from startle reactions. Such visual disturbances could be of particular concern connected with performing safety-critical operations. Users should not stare at the beam and perform active protective reactions by moving the head or closing the eyes to avoid continued intrabeam viewing.**

Electromagnetic Compatibility

The RP-VITA system complies with IEC 60601-1-2, General Requirements for Safety—Collateral standard: Electromagnetic compatibility. Performance of the device is unaffected by exposure to the compliance levels described in Tables 1,2,3 and 4 in the following section.

Special precautions and installation information for the RP-VITA for electromagnetic compatibility (EMC) are provided below:

- Equipment in hospital environments, including the RP-VITA and other portable or mobile communications equipment, can produce Electromagnetic Interference (EMI), which may affect the function of these devices. Such effects are prevented by use of equipment with EMI characteristics proven below recognized limits, as identified in the tables below.
- In the event of suspected interference from other equipment, which prevents the proper functioning of the RP-VITA, contact InTouch Health and/or discontinue use of the system until the problem can be remedied.

The following tables contain the Manufacturer's declaration and additional information required by IEC 60601-1-2.

Table 1: Guidance and Manufacturer's Declaration - Electromagnetic Emissions

The RP-VITA is intended for use in the electromagnetic environment specified below. The customer or the user of the RP-VITA should assure that it is used in such an environment.

Emissions Test	Compliance	Electromagnetic Environment
RF Emissions CISPR 11	Group 1	The RP-VITA uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.
RF Emissions CISPR 11	Class A	The RP-VITA is suitable for use in all establishments other than domestic and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.
Harmonic Emissions IEC 61000-3-2	Class A	
Voltage Fluctuations / Flicker Emissions IEC 61000-3-3	Complies	

Table 2: Guidance and Manufacturer's Declaration - Electromagnetic Immunity

The RP-VITA system is intended for use in the electromagnetic environment specified below. The customer or the user of the RP-VITA should assure that it is used in such an environment.

Immunity Test	EC 60601 Test Level	Compliance Level	Electromagnetic Environment - Guidance
Electrostatic Discharge (ESD) IEC 61000-4-2	±6 kV Contact ±8 kV Air	±6 kV Contact ±8 kV Air	Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30%.
Electrical Fast Transient / Burst IEC 61000-4-4	±2 kV for Power Supply Lines ±1 kV for Input / Output Lines	±2 kV for Power Supply Lines ±1 kV for Input / Output Lines	Mains power quality should be that of a typical commercial or hospital environment.
Surge IEC 61000-4-5	±1 kV Line(s) to Line(s) ±2 kV Line(s) to Earth	±1 kV Line(s) to Line(s) ±2 kV Line(s) to Earth	Mains power quality should be that of a typical commercial or hospital environment.
Voltage Dips, Short Interruptions, and Voltage Variations on Power Supply Input Lines IEC 61000-4-11	<5% U_T (>95% dip in U_T) for 0.5 cycle 40% U_T (60% dip in U_T) for 5 cycles 70% U_T (30% dip in U_T) for 25 cycles <5% U_T (>95% dip in U_T) for 5 sec	<5% U_T (>95% dip in U_T) for 0.5 cycle 40% U_T (60% dip in U_T) for 5 cycles 70% U_T (30% dip in U_T) for 25 cycles <5% U_T (>95% dip in U_T) for 5 sec	Mains power quality should be that of a typical commercial or hospital environment. If the user of the RP-VITA requires continued operation during power mains interruptions, it is recommended that the RP-VITA be powered from an uninterruptible power supply or a battery.
Power frequency (50/60 Hz) Magnetic Field IEC 61000-4-8	3 A/m	3 A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.

U_T is the a.c. mains voltage prior to application of the test level.

Table 3: Guidance and Manufacturer's Declaration - Electromagnetic Immunity

The RP-VITA is intended for use in the electromagnetic environment specified below. The customer or the user of the RP-VITA should assure that it is used in such an environment.

Immunity Test	EC 60601 Test Level	Compliance Level	Electromagnetic Environment - Guidance
Conducted RF IEC 61000-4-6 Radiated FR IEC 61000-4-3	3 Vrms 150 kHz to 80 MHz 3 V/m 80 MHz to 2.5 GHz	3 Vrms 150 kHz to 80 MHz 3 V/m 80 MHz to 2.5 GHz	Portable and mobile RF communications equipment should be used no closer to any part of the RP-VITA, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. Recommended separation distance: $d = 1.2\sqrt{P}$ $d = 1.2\sqrt{P}$ 80 MHz to 800 MHz $d = 2.3\sqrt{P}$ 800 MHz to 2.5 GHz where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and d is the recommended separation distance in meters (m). Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey, should be less than the compliance level in each frequency range. Interference may occur in the vicinity of equipment marked with the following symbol: 

NOTE 1: At 80 MHz and 800 MHz, the higher frequency range applies.

NOTE 2: These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects, and people.

a. Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast, and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the RP-VITA is used exceeds the applicable RF compliance level above, the RP-VITA should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as re-orienting or relocating the RP-VITA.

b. Over the frequency range 150 kHz to 80 MHz, field strengths should be less than [V1] V/m.

Table 4: Recommended separation distances between portable and mobile RF communications equipment and the RP-VITA.

The RP-VITA is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the RP-VITA can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the RP-VITA as recommended below, according to the maximum output power of the communications equipment.

Rated Maximum Output Power of Transmitter (W)	Separation distance according to frequency of transmitter (m)		
	150 kHz to 80 MHz $d = 1.2\sqrt{P}$	**80 MHz to 800 MHz** $d = 1.2\sqrt{P}$	**800 MHz to 2.5 GHz** $d = 2.3\sqrt{P}$
0.01	0.12	0.12	0.23
0.1	0.38	0.38	0.73
1	1.2	1.2	2.3
10	3.8	3.8	7.3
100	12	12	23

For transmitters rated at a maximum output power not listed above, the recommended separation distance d in meters (m) can be estimated using the equation applicable to the frequency of the transmitter, where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer.

NOTE 1 At 80 MHz and 800 MHz, the separation distance for the higher frequency range applies. NOTE 2 These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.

RP-VITA Warnings

- InTouch Health requires all users to first be trained in the proper use of the RP-VITA. The RP-VITA stands approximately 5.5 ft. tall (168 cm) and weighs about 180 lb. (82 kg). An untrained ControlStation operator could potentially bring about a collision, possibly causing damage or injury.
- The RP-VITA is designed to utilize the 802.ll communication protocol as well as the public internet in order to achieve its intended purpose. Failures in either of these supporting systems could cause a complete loss of communication between the ControlStation and the RP-VITA. Consequently, the RP-VITA should not be utilized in any activities where successful completion of the activity is dependent upon uninterrupted communication between the RP-VITA and the ControlStation.
- A tested backup method of communication should be made available in the event that network communication is lost.
- To ensure proper operation, users should be thoroughly familiar with the Remote Presence System. Study of this Reference Manual is essential to ensure proper operation. In addition, completion of proper training by an InTouch Health Representative is required for safe operation. All questions should be referred to the local InTouch Health Sales Representative or InTouch Health Technical Service.
- The RP-VITA is not MRI (Magnetic Resonance Imaging) safe and is not MRI compatible. The RP-VITA should only be used in locations where the presence of metal is not controlled.
- Flammable Anaesthetics: The RP-VITA is not suitable for use in the presence of flammable anaesthetic mixture with air, or in the presence of a flammable anaesthetic mixture with oxygen or nitrous oxide.
- Do not attempt to open or remove any parts of the RP-VITA. To reduce the risk of electric shock, do not remove the cover.
- There are no user-serviceable components inside. Refer servicing and repair to qualified personnel only.
- The RP-VITA contains high capacity rechargeable, Lithium-Ion batteries. The RP-VITA should be plugged in when not in use to avoid deep discharge cycles that can shorten the battery's useful life. Other than keeping the batteries charged by keeping the RP-VITA plugged in, no user maintenance of the batteries is required.
- Provide adequate ventilation. The RP-VITA may overheat if powered on or plugged in and charging while stored for extended periods in an area without adequate ventilation.
- Leakage current from interconnected electrical equipment may exceed safe levels. In order to maintain patient and user safety, it is important to interconnect only with devices in compliance with IEC 60601-1-1 requirements. It is the responsibility of the user to ensure that any interconnected equipment not supplied by InTouch Health maintains compliance with IEC 60601-1-1 requirements.
- The video images transmitted to and displayed on the RP-VITA and ControlStation may not contain all of the information in the original scene. Video information from the camera is captured, compressed, transmitted, and redisplayed remotely at a different resolution. As a result information in the original scene may be lost.
- Color reproduction in the transmitted video is not guaranteed. Color reproduction in a video system is a complicated combination of lighting, cameras, and display technology. It should not be assumed that the colors on the display are an exact replication of the actual colors in the scene.
- Clinical judgment and experience are required to review and interpret images and information transmitted via the RP-VITA and ControlStation.

RP-VITA Cautions

- Adding third party software or hardware to the RP-VITA may cause it to malfunction or operate erratically. Excluding those devices designed for connection through existing hardware ports, InTouch Health does not support the addition of third party software or hardware to the RP-VITA. Please check with Technical Service PRIOR to installing any other third party devices.
- To ensure system readiness, connectivity, and charged batteries, power on the RP-VITA at least two hours before its intended use. This will allow the RP-VITA to check for and install any available software updates.
- When cleaning the RP-VITA, do not immerse the RP-VITA as it contains sensitive electronics. Wipe down the surfaces as specified in the RP-VITA Cleaning Procedure (pg. 19) section of this Reference Manual. Do not allow any cleaning solution inside the RP-VITA. Avoid excess solution which may enter the RP-VITA through its openings.
- Always push the Emergency Stop button in when connecting video equipment to the Auxiliary Video Input. Disconnect the equipment when ending a session and before pulling the Emergency Stop button out to enable the RP-VITA's (base) movements. The RP-VITA has AutoDRIVE modes that will be commanded when it is not in session. For example, the RP-VITA will return to its charging dock when its battery charge is running low. The RP-VITA and/or attached equipment may be damaged if the RP-VITA is driven with equipment connected to its Inputs.
- DO NOT USE phenolic germicidal detergent solutions on any parts of the RP-VITA. Contact InTouch HealthTechnical Support for other approved cleaning solutions.
- Severe contamination, especially of the undercarriage (roller wheels, etc.), may require some disassembly. Cleaning in such cases shall only be performed by InTouch Health representatives.
- Do not tilt RP-VITA onto its bumpers or attempt to place RP-VITA on its back. The bumpers located on the bottom edge of RP-VITA may be damaged.

RP-VITA Anatomy and Components

Note: The RP-VITA contains no user serviceable parts and requires no maintenance. For further information regarding maintenance or assistance with troubleshooting, customers should contact InTouch Health Technical Service.

1	Virtually There Cameras	Captures remote video for viewing at the ControlStation.
2	Directional Microphone	Captures audio for playback on the ControlStation
3	Laser Pointer	FDA Class II Laser Pointer[a] fixed to the RP-VITA pan/tilt Head. **Avoid exposure. Laser radiation is emitted from this aperture.**
4	RP-VITA Head Speakers	Plays audio from ControlStation microphone on RP-VITA. A sub woofer speaker is also located in the RP-VITA torso.
5	Remote Display	Displays remote user's face (video from the ControlStation) or recorded pictures and video from the ControlStation on RP-VITA.
6	Volume Control Knob	Used to adjust volume, see label on Chest Display.
7	RP-VITA Chest Display	Touch-screen used for local control of RP-VITA.
8	Volume Control Knob	Used to adjust volume, see label on Chest Display.
9	Collision Avoidance Sensors	RP-VITA uses FDA Class 1 Laser sensors to provide for detection of obstructions in its surroundings.
10	Left and Right Upper LED indicators	RP-VITA status indicators. Refer to "RP-VITA Status Indicator lights" on page 16.
11	Lower LED indicators under all four sides of base	RP-VITA status indicators. Refer to "RP-VITA Status Indicator lights" on page 16.
12	Emergency Stop Button	Stops RP-VITA's (base) movements by disengaging its motors. Also, used to disengage wheels, when needing to quickly move RP-VITA manually.
13	Storage/Expansion Bays	An expansion bay is located on each side of the RP-VITA. One side contains storage, the other side contains the Input/Output ports for connecting approved devices to RP-VITA.
14	LED Power Light	LED indicating main power is on.
15	Power Cord/RP-VITA Power Button (behind door)	Power cord used to recharge RP-VITA without the charging station Dock. The RP-VITA power button turns on the computer and display.
16	Main Power On/Off Switch	Supplies power to the RP-VITA either from the batteries or from external power when Docked or plugged in.
17	RP-VITA Docking Plug Block	Used to connect to charging station (allows automated Docking).

a. The RP-VITA utilizes a Class II Laser Pointer which complies with 21 CFR Chapter 1, subchapter j. Maximum Laser radiation output is less than one milliWatt at a wavelength of 635 nanometers.

Caution: **Dazzle, flash-blindness, and afterimages may be caused by a beam from a Class II laser product, particularly under low ambient light conditions. This may have indirect general safety implications resulting from temporary disturbance of vision or from startle reactions. Such visual disturbances could be of particular concern connected with performing safety-critical operations. Users should not stare at the beam and perform active protective reactions by moving the head or closing the eyes to avoid continued intrabeam viewing.**

Warning: **The RP-VITA is not MRI safe nor MRI compatible and should only be used in locations where the presence of metal is not controlled.**

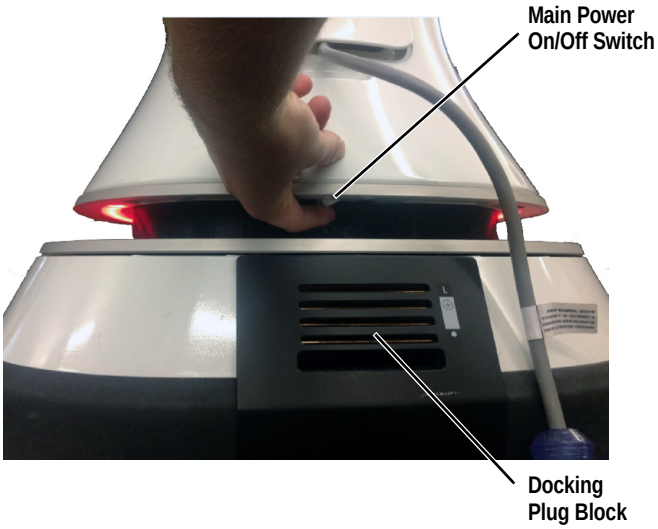
Warning: **Flammable Anaesthetics: The RP-VITA is not suitable for use in the presence of flammable anaesthetic mixture with air, or in the presence of a flammable anaesthetic mixture with oxygen or nitrous oxide.**

RP-VITA Power Controls

The RP-VITA has two power controls:

- the Main Power On/Off switch, that controls power from either the wall plug or the batteries; and
- the RP-VITA computer power button which controls only the computer.

The Main Power On/Off switch is located just below the skirt on the base, above the Docking Plug Block.



The Main Power On/Off switch, which remains in either the Off or On position, controls the power to the RP-VITA. If the RP-VITA is not plugged in or docked, the power is provided from the battery. The RP-VITA Main Power On/Off switch should stay On, except during storage, service, transport, or to avoid depleting the battery.

Power On Sequence

1. RP-VITA is at its docking station or plug the power cord into an approved wall socket.
2. Turn On the Main Power On/Off Switch:

   Wait until you see that the LED (14, page 11) is lit before proceeding to next step. If needed, cycle the switch for Main Power and wait until the LED (14) is lit.
3. Turn On the power to the computer:

   Press and hold in the computer power button for about one second.

   Check to ensure the Display powers up successfully.

   After a period of self-testing (1-2 minutes), the screen saver should appear on the Display.

   - RP-VITA will charge to 80% in two hours.
   - RP-VITA will charge to 100% in six hours.

The RP-VITA should be docked (or plugged in) and left powered on at all times.

Caution: **In case you have powered RP-VITA off; to ensure system readiness, connectivity, and charged batteries, power on the RP-VITA at least two hours before its intended use. This will allow the RP-VITA to check for and install any available software updates.**

Power Off Sequence

The RP-VITA has two power controls:

- the Main Power On/Off switch, that controls power from either AC or the batteries; and
- the RP-VITA computer power button which controls only the computer.

Caution: **When powering down the RP-VITA for any reason, always ensure that the computer power button is powered off first and that the RP-VITA Display screen turns off (goes to black, approximately 30-45 seconds) before turning off the Main Power On/Off switch.**

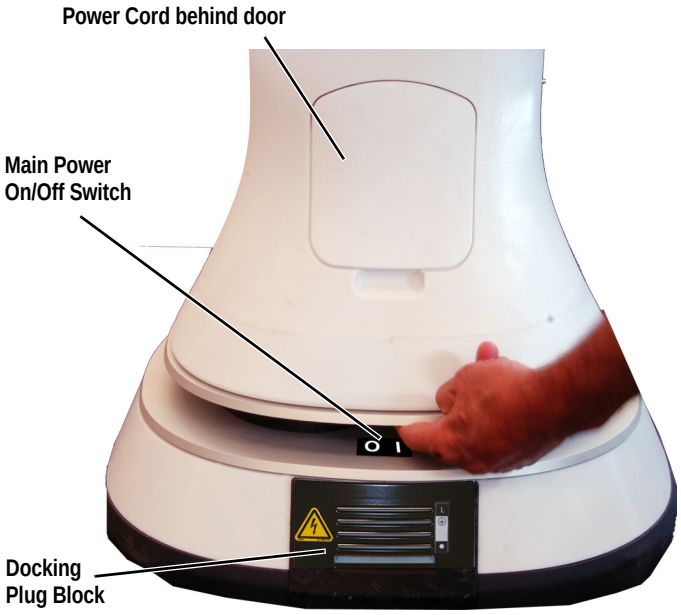
1. **Turn Off the Power to the computer:**

   Press and hold in the computer power button for about one second.

   Check to ensure that the Display screen turns off (goes to black, approximately 30-45 seconds).

   If the computer does not shut down following the above step, you can force a shut down by holding the computer power button in for several seconds until the RP-VITA Display screen turns black.

2. **Turn Off the Main Power On/Off Switch:**



Recharging the RP-VITA

- RP-VITA will charge to 80% in two hours.
- RP-VITA will charge to 100% in six hours.

If Dock is not available for any reason and RP-VITA needs to be charged, plug the RP-VITA into a standard grounded 115 VAC, 15 Amp outlet.

Note: The power plug has an internal light which lights when plugged into a live outlet. Ensure it is lit when charging with the power plug.

AutoDRIVE to Dock—The RP-VITA can be sent to its Dock from the ControlStation or by hospital personnel using the Touch-Screen Chest Display.

See AutoDRIVE RP-VITA (pg. 17).

Caution: **The RP-VITA contains high capacity rechargeable, Lithium-Ion batteries. The RP-VITA should be plugged in when not in use so it is fully charged and ready for the next consult and to avoid deep discharge cycles that can shorten the battery's useful life. Other than keeping the batteries charged by keeping the RP-VITA plugged in, no user maintenance of the batteries is required.**

EMERGENCY STOP Button

To disable RP-VITA movement:

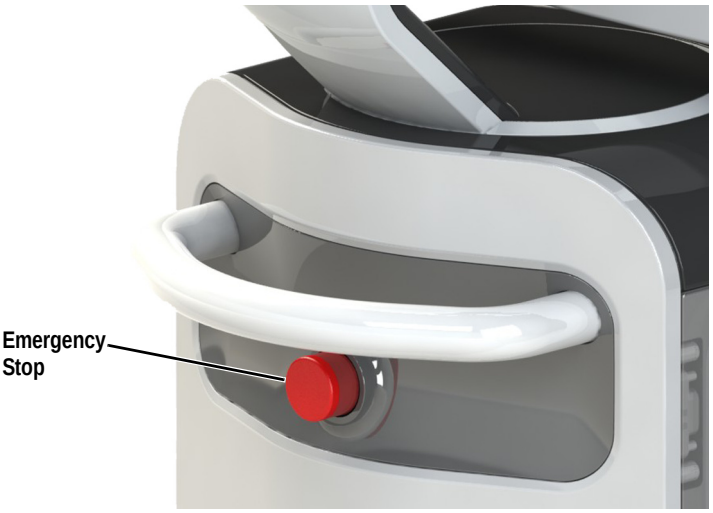
- Depress the RED Emergency Stop Button.

The Robot computer will stay On, but Robot cannot be driven as base motors are disengaged.

The Robot can now be pushed as needed.

To enable RP-VITA movement again:

- Twist the RED Emergency Stop Button clockwise approximately 1/4 turn until it pops out.



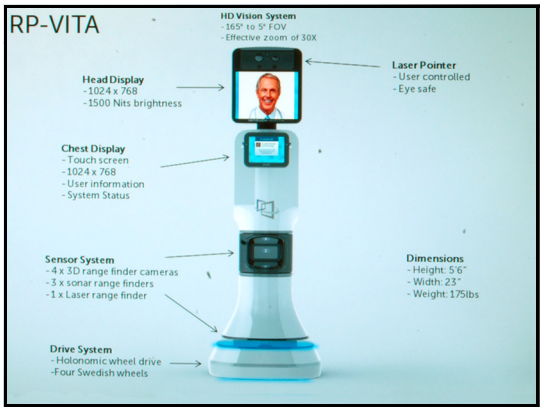
Volume Adjustment Knobs

The RP-VITA has two volume controls: one on each side of the Touch-screen Display.

RP-VITA Monitor Display

When RP-VITA is actively connected to a ControlStation, the video from the ControlStation will be displayed on the RP-VITA monitor screen and the name of the person in the session will be shown on the Chest Display.

When the RP-VITA is NOT actively connected to a ControlStation, a screen saver will appear, which consists of various scrolling pictures.



The RP-VITA Touch-Screen Chest Display provides in-session information and local control of the RP-VITA. Whenever the RP-VITA is powered on, you can tap the Chest Display to show the robot ID number, battery charge and Wi-Fi signal bars, Technical Support telephone number, and on screen buttons (**Settings**, Home, **Apps**, and **AutoDRIVE**).

Tap the **AutoDRIVE** button to “drive” the RP-VITA to any learned location. See AutoDRIVE RP-VITA.

The Home button takes you to the Home screen from any other screen.

Tap the **Settings** button to select network connections or access detailed information concerning RP-VITA. See Settings Screen.

RP-VITA Status Indicator lights

RP-VITA has LED light strips that indicate its operational status and condition. Lights are located on all four sides under the base and on the left and right sides just above the base. The meaning of the indicator lights is described in the following table. See “RP-VITA Anatomy and Components” on page 11 for the location of these indicator lights.

RP-VITA Status	LED Color, Animation
Start Up	Gray, static
Not In-Session (idle)	White[a], static
Not In-Session (charging)	White, sinusoidal
Mission—AutoDRIVE command from the Chest Display other than Dock.	Turquoise, static
In-Session	Blue, static
E-Stop	Orange[b], static
Fault Condition	Yellow[b], flashing

a. If RP-VITA is going to its Dock and is not currently in a session, the LED colors will be static white. This can occur as a result of RP-VITA being sent to the Dock from the Chest Display or a disconnected session, losing its WiFi signal, or because of an idle or low battery timeout.
b. It may be difficult to distinguish between LED colors orange and yellow. Note that a fault condition is flashing.

AutoDRIVE RP-VITA

To initiate a Mission, tap the **AutoDRIVE** button, then tap a location button.

- While in motion, the Chest Display shows a **Touch the screen to stop** message. Tap the screen to halt RP-VITA.
- When stopped, the Chest Display shows Resume and Cancel buttons. Tap the Resume button to allow RP-VITA to continue on to its destination. If not resumed or canceled, the navigation will time out.
- The RP-VITA will report when it reaches its destination or if it fails to reach its destination.

To initiate automated docking, when it is available, tap the **AutoDRIVE** button, then the **Dock** button.

Settings Screen

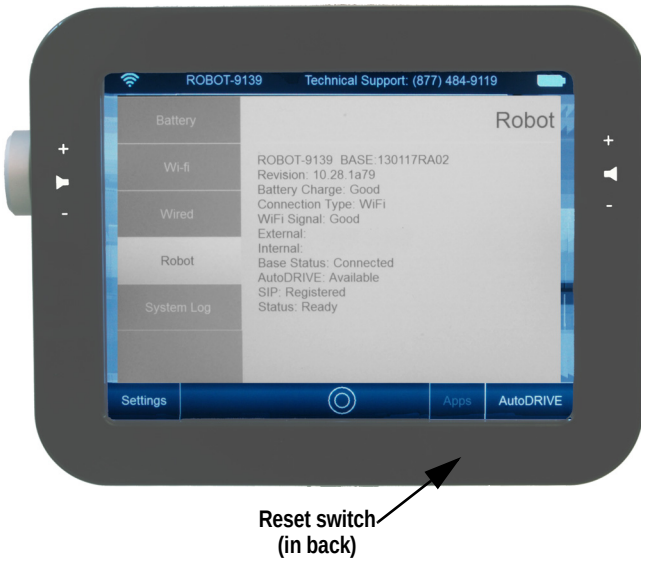
Tap the **Battery** button to check the battery charge.

Tap the **Robot** button to see the robot software version number, server access information, robot message log, and to reset the robot software.

Tap the **WiFi** button to see available WiFi network connections and manually select a connection.

Tap the **Wired** button to see network information if the robot is hardwired to the network.

Note: The RP-VITA has a hardware Reset switch located through a hole on the back edge of the Chest Display. If the Reset button does not respond, please use the RP-VITA's Computer Power Button to turn RP-VITA off and then on.



Charging Status Indicator lights

The charging station has an LED indicator light located on the top of the Dock. In addition, the power plug contains a light which lights when plugged into a live AC outlet.

Charging Station Dock	LED State
No AC power applied	Off
AC power applied, not mated to robot	On
AC power applied, mated to robot	On - blinking
RP-VITA Power Plug	**Light State**
Plugged in and powered	On
Unplugged or not powered	Off

RP-VITA Messages: These text messages may appear in the lower right of the RP-VITA Monitor.

Message	Explanation	Action
"Internet connection slow." "Internet connection failure	Very high round-trip latency at ControlStation or RP-VITA. Possible cause: poor internal network conditions, low Quality of Service Internet connection or excessive bandwidth usage.	These error messages represent non-optimal Internet connection conditions. They may happen periodically on many networks under normal conditions. However, if they persist, contact the hospital's IT department.
	Packets lost. May see jumpy video with lower frame rates at ControlStation or RP-VITA. Possible cause: poor internal network conditions, low Quality of Service Internet connection or excessive bandwidth usage.	
	Problem was detected on reverse side (i.e., at the ControlStation if located at RP-VITA, or on RP-VITA if operating ControlStation). These messages are shown if problem is only being detected in one direction.	
"Internet failure: Audio lost." "Internet failure: severe loss."	Packets containing audio data lost, therefore user may notice loss of audio at ControlStation or RP-VITA. Possible cause: poor internal network conditions or low Quality of Service Internet connection or excessive bandwidth usage.	
"Internet failure: Audio lost remotely." "Internet failure: severe loss remotely."	Problem was detected on reverse side (i.e., at ControlStation if located at RP-VITA, or on RP-VITA if operating ControlStation). These messages are shown if problem is only being detected in one direction. Important because user might be able to hear, but people on reverse side cannot hear user.	

Warning: **Do not attempt to open or remove any parts of the RP-VITA. To reduce the risk of electric shock, do not remove the cover. There are no user-serviceable components inside. Refer servicing and repair to qualified personnel only.**

Caution: **Adding third party software or hardware to the RP-VITA may cause it to malfunction or operate erratically. Excluding those devices designed for connection through existing hardware ports, InTouch Health does not support the addition of third party software or hardware to the RP-VITA. Please check with Technical Service PRIOR to installing any other third party devices.**

Note: If RP-VITA fails to operate for any reason, it can be moved by depressing the RED Emergency Stop Button and then, pushing it with the Handle.

RP-VITA Cleaning Procedure

Warning: **Do not attempt to open or remove any parts of the RP-VITA.**
To reduce the risk of electric shock, do not remove any covers.
There are no user-serviceable components inside.
Refer servicing and repair to qualified personnel only.

Caution: **DO NOT USE phenolic germicidal detergent solutions on any parts of the RP-VITA. Contact InTouch HealthTechnical Support for other approved cleaning solutions.**

Caution: **Severe contamination, especially of the undercarriage (roller wheels, etc.), may require some disassembly. Cleaning in such cases shall only be performed by InTouch Health representatives.**

It is recommended that the outer surfaces of the RP-VITA be cleaned when visibly soiled and/or after contact with any contaminates. All surfaces, display monitors, sensor windows, etc. may be disinfected using the following procedure. In addition, you may use commercial LCD computer screen cleaners to prevent craze, staining, or discoloration of the display monitors and optical lens cleaners to clean the camera lenses.

- Prior to cleaning, make sure the RP-VITA is unplugged and the power is Off.

Warning: **Wear safety glasses, especially when handling solution prior to dilution. Use rubber or nitrile gloves if in contact liquid. Avoid contact with eyes, skin and clothing. Wash hands after direct contact. Do not wear product-contaminated clothing for prolonged periods.**

Caution: **DO NOT IMMERSE the RP-VITA.**
DO NOT ALLOW any cleaning solution inside the RP-VITA.
Avoid excess solution which may enter the RP-VITA through its openings.

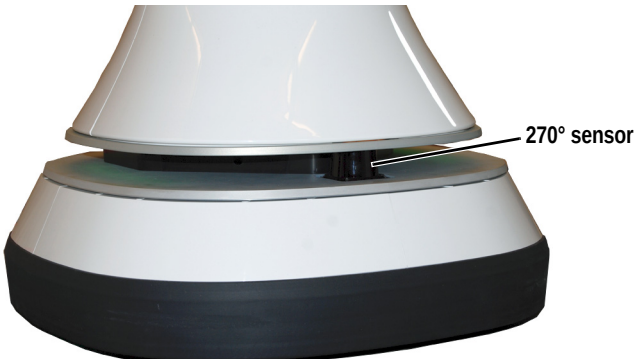
- Soak a clean rag in a hospital grade disinfectant solution of sodium hypochlorite 6.15%, e.g., dilution 1:500 (1/4 oz. per gallon water) and wring out the rag such that drips will not appear when wiping surfaces.
- Wipe surfaces that have become soiled or contaminated. Avoid applying excess solution which may enter the RP-VITA through its openings.
- Allow to air dry.

Caution: **The RP-VITA should be kept free from moisture and extreme temperatures.**

Cleaning Sensor Windows

The sensor windows should be kept clean to ensure dirt or foreign particles are not interpreted as objects to avoid when the RP-VITA is moving.

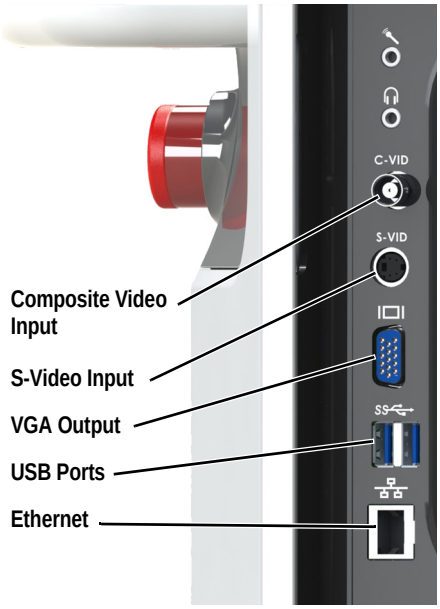
- Clean all three windows of the waist sensor.
- Clean the entire 270° extent of the sensor located under the skirt at the front of the RP-VITA.



Auxiliary Video Ports

The RP-VITA's expansion bay includes both video input ports and a VGA output port. The USB ports can also serve to capture video from approved USB cameras. This allows the remote physician to view multiple video inputs through the ControlStation application.

The VGA output allows the video from the ControlStation (shown on the RP-VITA remote display) to be shown on a different screen or by using a projector.



Warning: **The video images transmitted to and displayed on the RP-VITA and ControlStation may not contain all of the information in the original scene. Video information from the camera is captured, compressed, transmitted, and redisplayed remotely at a different resolution. As a result information in the original scene may be lost.**

Warning: **Color reproduction in the transmitted video is not guaranteed. Color reproduction in a video system is a complicated combination of lighting, cameras, and display technology. It should not be assumed that the colors on the display are an exact replication of the actual colors in the scene.**

Warning: **Clinical judgment and experience are required to review and interpret images and information transmitted via the RP-VITA and ControlStation.**

Caution: **Always push the Emergency Stop button in when connecting video equipment to the Auxiliary Video Input. Disconnect the equipment when ending a session and before pulling the Emergency Stop button out to enable the RP-VITA's (base) movements. The RP-VITA has Autonomous drive modes that will be commanded when it is not in session. For example, the RP-VITA will return to its charging Dock when its battery charge is running low. The RP-VITA and/or attached equipment may be damaged if the RP-VITA is driven with equipment connected to its Inputs.**

Unpacking and Charging the RP-VITA

Carefully remove the RP-VITA from its packaging taking care not to cause damage.

Plug the RP-VITA into any standard AC outlet and allow the system to reach a full charge (may take 6 hours or more).

Note: The power plug has an internal light which lights when plugged into a live outlet. Ensure that the light is lit when power plug is plugged into an outlet.

(See Recharging the RP-VITA (pg. 14) for more information.)

Warning: **The RP-VITA is not MRI safe nor MRI compatible and should only be used in locations where the presence of metal is not controlled.**

Warning: **Flammable Anaesthetics: The RP-VITA is not suitable for use in the presence of flammable anaesthetic mixture with air, or in the presence of a flammable anaesthetic mixture with oxygen or nitrous oxide.**

RP-VITA Dock

The RP-VITA dock must be mounted in an area accessible to the RP-VITA and plugged into a standard grounded 115 VAC, 15 Amp outlet.

Charging Status Indicator lights

Charging Station Dock	LED State
No AC power applied	Off
AC power applied, not mated to robot	On
AC power applied, mated to robot	On - blinking
Power Plug	**Light State**
Plugged in and powered	On
Unplugged or not powered	Off

Network Configuration

Wireless Network Considerations

The RP-VITA requires a wireless network distributed over the area where it is intended to roam. 802.11b wireless networks are typically used, though the RP-VITA may be configured for 802.11a, 802.11b, 802.11g, or 802.11n.

To attain optimal performance there are several considerations which must be taken into account when designing the wireless network.

Configuring the RP-VITA's Wireless Connection

The RP-VITA's RP Control Core uses Windows Embedded 7 WiFi management utility. The network card is an Intel Centrino Ultimate-N 6300 ABGN card.

Non-overlapping channels

In order to achieve a smooth transition from one wireless access point (WAP) to the next it's important to configure each WAP on a non-overlapping channel.

Transmitting power

The WAPs may be configured to provide the wireless signal at different power transmission levels. Setting the WAP to the maximum power transmission (100 mW for 802.11b) will deliver the maximum coverage area.

Interference

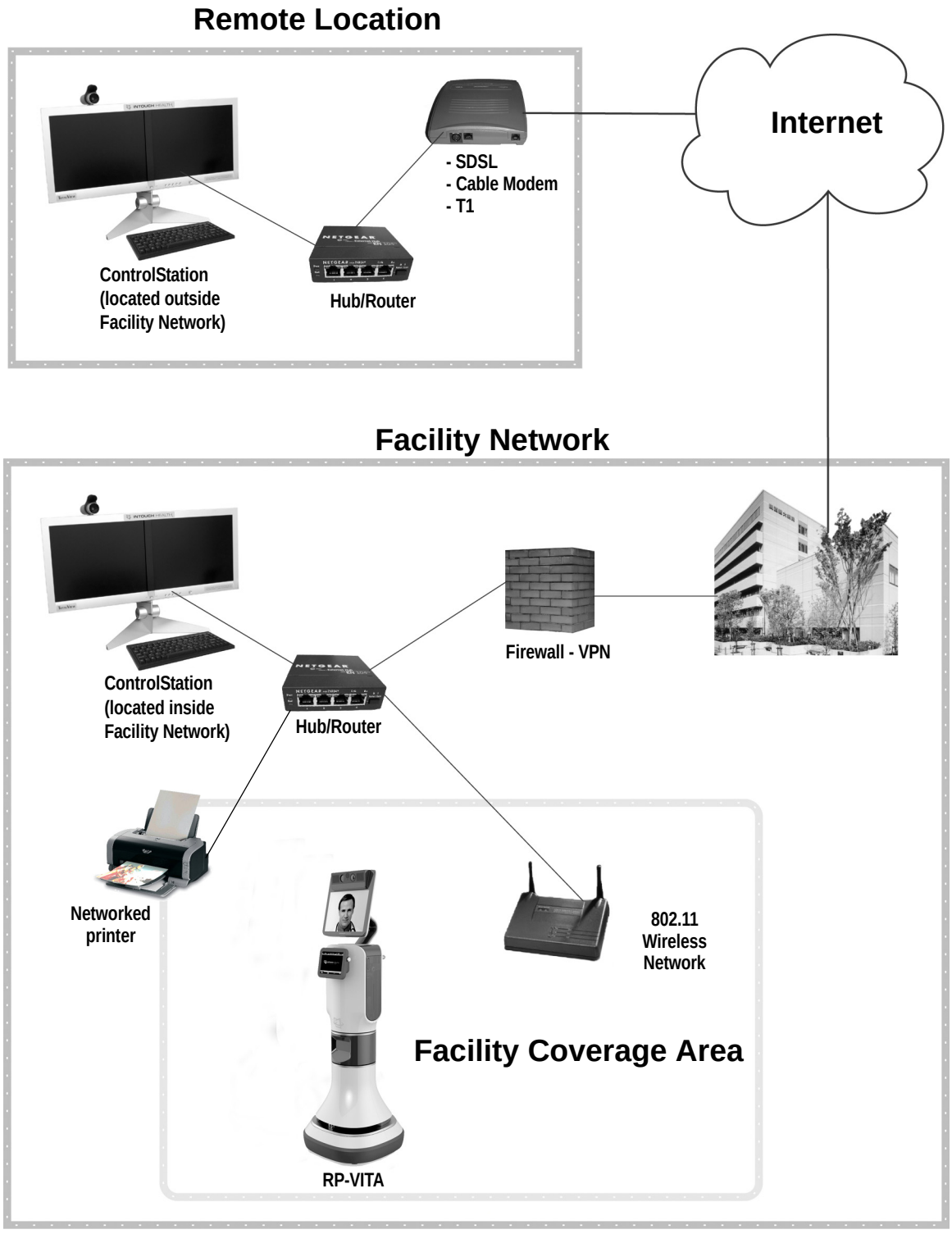
If WAPs are co-located in the same environment, radio frequency interference may be generated. Too many WAPs transmitting on overlapping channels may also degrade the wireless signal quality.

WAPs placed too close to one another may also produce RF congestion. In this case, the WAP transmission power should be reduced; therefore, reducing the coverage area and limiting the overlap between adjacent WAPs.

Security Options

Each wireless network must be configured with security to prevent unauthorized access to the network. The Windows Embedded 7 WiFi management utility provides multiple features to configure the RP-VITA to access as well as secure the wireless network. Common security options include WEP, EAP and LEAP.

Remote Presence System Network Communication



Network Requirements

The Remote Presence System is comprised of a Remote Presence RP-VITA and a minimum of one ControlStation. The ControlStation and RP-VITA are linked via the Internet over a secure connection. The RP-VITA operates on either an 802.11 Wi-Fi network or via Ethernet.

ControlStation User Authentication

The ControlStation Application can be configured by InTouch Health to provide user authentication at startup. It is strongly recommended that Windows user account control additionally be employed to protect the system from potential damage by unauthorized users.

If password protection is enabled, but the ControlStation is not connected (or in the process of connecting) to an RP Device, the ControlStation will automatically close after five minutes as an additional means of protecting the system from unauthorized access

Firewall Requirements

The RP System uses bidirectional communication under TCP and/or UDP. For optimal connections, RP Devices and ControlStations require outgoing UDP access on ports 9000-9101 with reflexive UDP access ('UDP Replies') enabled. (Note: UDP replies are enabled by default on most firewalls.)

In order to assure robust operation, the InTouch Health applications log usage and error information on InTouch Health servers. All RP Devices and ControlStations behind firewalls require outgoing HTTP and HTTPS access (outgoing TCP through port 80 and port 443) at a minimum.

For training and support purposes (including software upgrades), InTouch Health routinely makes use of remote desktop applications (Kaseya, GoToAssist & GoToMyPC). InTouch Health requires access to all RP Devices and ControlStations via one of these applications.

For a detailed list of IP addresses and ports to white list, please refer to the document: IT Specifications – Suggested Firewall Configuration (MB-15513). Additional modifications may be necessary for use with a Web Filter and/or Stateful Packet Inspection.

Video Information

Frame rate: Video is captured at 30 frames per second but can be reduced for low bandwidth connections.

Codec (video and audio compression): InTouch Health uses the standards-based H.264 codec for video and the Speex codec for audio.

Dynamic Video Quality provides the ability to dynamically adjust resolution and video quality during a live session without user interaction. Advanced users can specify preferences for adjusting resolution. Video quality depends on factors such as robot motion, available bandwidth, and user preference.

Bandwidth Requirements

The ideal bandwidth required is 700 kbps in both directions from any ControlStation or RP Device. For ControlStations located in homes, lower bandwidths such as home cable broadband can be configured with good performance effectively utilizing 300 kbps. For installations where higher audio and video quality is desired, higher bandwidths above 700 kbps can be allocated.

Line Quality Requirements

Network performance is critical to maintaining a responsive Control Station to RP Device session. Metrics cover a range of network characteristics which impact delivery of complete correct data in the proper order in a timely fashion. InTouch Health runs tests using proprietary and third party software tools to determine if a broadband connection (wired or wireless) meets a sufficient level of network performance to maintain a session. InTouch Health can provide these tools to customers upon request.

Note: During any particular session, quality may be degraded or the session may be disconnected if the network performance limits described below are exceeded, even though performance measurements were within limits at another point in time.

There are five important network characteristics affecting connectivity:

- **Data rate**: A connection must have the required up-stream and downstream bandwidth, as discussed above.
- **Latency (delay)**: Average network latency on a connection should not exceed 300ms.
- **Reliability**: A connection must be reliable, without significant packet loss. A connection should experience no more than 3% packet loss.
- **Jitter**: Jitter is variability in latency. Jitter on a connection should not exceed +/- 50ms during 95% of the duration of a session.
- **Maximum Transfer Unit**: The Maximum Transfer Unit (MTU) must not be set below 1400 bytes.

Note: InTouch Health's software is fully capable of dealing with the normal variability of data over the Internet. It is the quality of the endpoint connections which is critical and must be tested.

Wireless Network Requirements

The InTouch Health System is compatible with 802.11 a, b, g, and n protocols. The Maximum Handoff Threshold time must be less than 150ms.

In environments which experience network congestion, the InTouch Health application requires Quality of Service (QoS) or priority of traffic to ensure a successful connection.

Satellite Networks

The network characteristics detailed above (bandwidth requirements, packet loss, jitter, and MTU) are strongly recommended to achieve an audio/video session of functional quality over a satellite network. The one notable exception is the expected latency typical of satellite networks.

The InTouch Health System can maintain an audio/video session of functional quality with latency up to 900 ms if all other network characteristics are met. Please note that this delay will be evident on both sides of any audio/video/command communication as is typical of satellite networks.

If utilizing a satellite network with latency above 600 ms, the delay in drive commands may hinder the operator from maintaining safe control over the movement of mobile devices. InTouch Health therefore does not recommend utilizing mobile devices, such as the RP-7i, on a satellite network.

Encryption

The InTouch Health System incorporates encryption methodology utilizing a combination of RSA public/private key and 256-bit AES symmetric encryption. The following is a brief summary:

1. Each session is initiated by RSA public/private key data exchange. This exchange includes:
   a. Authentication of both parties, and
   b. Exchange of a uniquely generated symmetric key to be used in subsequent AES encryption/decryption (below).
2. Session data is encrypted using symmetric-key encryption with 256-bit AES. The AES key is unique for every session, and is sent via RSA public/private exchange during session initiation (above).

Virus Protection

TrendMicro’s OfficeScan is installed on every system. This software automatically updates as soon as new virus definitions are available. InTouch Health staff monitor software updates as they become available. InTouch Health staff install all necessary security updates on ControlStations and RP Devices.

Physical Specifications for RP-VITA

Weight: 176 lb. (79.82 kg)

Note: The RP-VITA contains no user serviceable parts and requires no maintenance. For further information regarding maintenance or assistance with troubleshooting, customers should contact InTouch Health Technical Service.

Performance		
Head:	Pan range: +/- 170° max Pan speed: 90°/sec max	Tilt range: 127° max Tilt speed: 90°/sec max
Base:	Maximum speed: 3.36 mph (forward) Locomotion: holonomic drive system	
Sensors:	Multiple center- and base-mounted cameras and sensors	FDA Class 1 Laser sensors detect obstructions up to 98 ft. (30m) within a 270 degree range centered about the front of the robot.
Audio:	Microphone: Mono, directional (hyper-cardiod), 50Hz-19kHz, Speakers: two 5 W mono speakers in the head and a sub-woofer in the base. Capable of 100dB sound (1KHz @ 1m).	16 kHz sampling rate, 16-bit audio
Video:	Camera: 120X equivalent zoom, remote zoom & focus Video: 30 fps, 648x480 px resolution, 24-bit color Display: 15 in LCD, 1024x768 Touch-screen: 8.4 in. LCD, 1024x760	Display: 15” LCD, 1024x768 px, 400 Nits
Wireless Network:	802.11 a, b, g, or n	
Battery Life:	4-5 hrs (depending on usage)	
Charging Time:	2 hours from 0% to 80% (6 hours to 100%)	
Driving Range: (distance)	Related to the size of the wireless network in use	

System Input Power Requirements:

Voltage:	115/230 VAC switchable by qualified personnel only
Frequency:	60/50 Hz
Current:	10/5 Amps

Classification:

- Internally Powered / Class I while in Charging Mode

General Specifications:

- Standard for Safety for Medical Electrical Equipment (UL 60601-1, Issued: 2003-04-25 Ed.:1 Rev: 2006/04/26).
- Standard for Medical Electrical Equipment (EN 60601-1:1988 + A1:1991 + A2:1995 / EN60601- 1: Includes Amd. A1: 1993, A11: 1993, A12: 1993, A2: 1995 and A13: 1996; IEC 601-1: 1988 +A1: 1991 + A2: 1995 + Corrig 1995).

EMC Classification:

- EN 60601-1-2:2001, A1:2006 Medical electrical equipment – Part 1-2: General requirements for safety – Collateral standard: Electromagnetic compatibility – Requirements and tests
- IEC 60601-1-2:2001, A1:2004 Medical Electrical Equipment – Part 1-2: General Requirements for Safety – Collateral Standard: Electromagnetic compatibility – Requirements and tests

Environmental Specifications:

Operating:

- Designed to operate in an indoor environment suitable for human personnel. (10° to 30° C, 30 to 75% RH, 700 hPa to 1,060 hPa)

Non-operating/Storage/Transport:

- Designed to travel to installations in commercial and cargo airliners and standard ground transportation. (-40° to +70° C, 10 to 100% RH, 500 hPa to 1,060 hPa)

Contact Information

Live Phone Support 24 x 7

(877) 484-9119

E-mail Support

ITHSupport@intouchhealth.com

Live Chat Support

http://www.intouchhealth.com/contactus.html
Monday – Friday, 5am – 5pm Pacific Standard Time (PST)

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P/N: MA-20016-001