REAL system

REAL y-Series®

USER MANUAL

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WARNING! CAREFULLY READ ALL INSTRUCTIONS PRIOR TO USE. OBSERVE ALL WARNINGS AND PRECAUTIONS NOTED THROUGHOUT THESE INSTRUCTIONS. FAILURE TO DO SO MAY RESULT IN COMPLICATIONS.

DEVICE DESCRIPTON

The REAL y-Series is a digital hardware and software medical device platform utilizing virtual reality and full body tracking sensor technology designed for use in healthcare and focusing on physical, neurorehabilitation, and/or wellness needs.

REAL y-Series consists of the following components:

- All-In-One Headset (HMD) with Software Experiences
- HMD Controller
- Large Sensor
- Small Sensors
- Sensor Charger (charging station)
- Tablet
- Router
- Router Battery
- REAL® Sensor Bands

Frequently used features and functions:

Headset (HMD)

- The headset provides visual feedback of virtual reality experiences in concert with the REAL y-Series tablet and large and small sensors.
- Plug headset power cord into headset to charge device, ensure y-Series power cord is plugged into wall outlet.
- Press the power button to turn on/off headset. The power button is on top of the headset.
- Press the volume buttons to adjust volume. The volume buttons are on the headset's left side.

HMD Controller

- Headset controller is to only be used for troubleshooting or administrative tasks. It is not used during patient therapy.
- The controller is used to access headset settings or control volume.

Large Sensor and Small Sensors

- Large and small sensors (WTM and WSMs) are equipped with mechanical and electrical components that measure motion and direction in physical space and then translate that information into a virtual environment.
- The sensors are removed and placed back into the sensor charger (charging station) to activate or charge the devices.
- The sensors are placed into the sensor bands that the user wears.

Sensor Charger

- The sensor charger charges the sensors. Ensure the REAL y-Series power cord is plugged into a wall outlet.

Tablet

- The tablet is fitted with a touch screen that allows the user to:
  - Launch REAL TherapyView™ application on the tablet
  - Log in
  - Add or select patient (online configuration only)
  - Select a therapy experience, activity, or assessment
  - Initialize and sync to sensors
  - Select, start, modify, or end therapy session
  - Customize assessments and therapeutic and wellness activities with adjustable settings
  - View objective measures for a session
  - View session and measure history (online configuration only)
  - Log out
- Plug tablet power cord into tablet to charge device, ensure y-Series power cord is plugged into wall outlet.
- Power on/off the Tablet
  - Press the power button to power on/off the tablet. The power button is on the edge of the device.

Router and Router Battery

- Router allows the REAL y-Series components to communicate with each other.
- Router battery provides power to the router when system is not connected to wall outlet.
- Online Configuration Only: Router connects the REAL y-Series to internet.

Sensor Bands

- Place or remove sensor bands on or from patient for upper or full body tracking.

Operating Configurations

REAL y-Series are available in two configurations:

Online Configuration (Catalog Code: RLY1):
The REAL y-Series online configuration is operated online by connecting the system to a wireless network to utilize assessments, therapeutic and wellness activities, and access session history. Follow the instructions in Section 2 to connect the REAL y-Series to a wireless network. Online mode allows for patient history from session to session.

Offline Configuration (RLY1S and RLY1V):
The REAL y-Series offline configuration is operated offline without the need to connect to a wireless network to utilize assessments and therapeutic and wellness activities. Access to session history is not available in this configuration.

At full charge, the entire system is designed to operate for a minimum of 60 minutes. For optimal connectivity between system components, it is recommended that you keep your system plugged in and all components charging between sessions.

In the event of electromagnetic and/or RF disturbances, the performance of the REAL y-Series may be affected.

The REAL y-Series is a Type BF Applied Part.

There is no preventive inspection, calibration, or maintenance necessary for the REAL y-Series besides the initial set up procedure. During the three-year product lifespan of the REAL y-Series, the device will continue to perform safely without any routine maintenance. No parts within the REAL y-Series will require inspection nor maintenance by a service personnel to ensure basic safety during the three- year product lifespan. Circuit diagrams and calibration instructions are not provided because service or parts repair is not necessary.

Contact your local Penumbra representative or Penumbra Product Technical Support if the system no longer stays powered on and connected through the entire recommended duration of a therapy session.

REAL sensor bands are recommended for one hundred uses or until the sensor bands no longer hold the sensors or its orientation.

Supply mains are electrically isolated in medical equipment to maintain basic safety.

The full expected latency of the device, including movement detection, processing, and visual representation is 35 milliseconds or less. This value is considered minimal and sufficiently low enough so that movement can be quickly detected.

INDICATION FOR USE
The REAL y-Series is an immersive virtual reality and display system that interactively displays and tracks rehabilitation exercises using a combination of virtual environments and full presence tracked avatars for visual feedback.

CONTRAINDICATIONS
There are no known contraindications.

WARNINGS
If a patient complains of motion sickness, dizziness, headache, eye strain, or fatigue when using the device, stop use of device immediately.

Use caution when using this device if a patient has a history of vestibular issues or motion sickness.

PRECAUTIONS
Ensure a safe environment for the patient while performing activities with the device (i.e. remove any surrounding obstacles and ensure that the patient is unlikely to trip or fall). Ensure a medical professional is with the patient at all times to prevent any injury.

Be aware of the patient's limitations in range of motion and avoid device or program use that could lead to excessive gestures that could injure a patient.

Incorrect placement of the sensors on the patient may result in the avatar appearing incorrectly or distorted on the headset and tablet.

Damage (mechanical and electrical) may result if the tablet, headset, sensors, and/or sensor charger are dropped or struck against another object. Device is not intended for continued use if dropped from higher than 1 meter.

Surface temperature around the headset exhaust may reach 46 °C if operating above nominal room temperature.

Sensors will transmit inaccurate position data if used near metal including, but not limited to, wheelchairs, walkers, utility carts, smartwatches and mobile devices.

Headset tracking can be lost or compromised if there is irregular or dim lighting in the room, the front facing camera sensors on the headset are obstructed or facing highly reflective surfaces, there is excessive motion in front of the patient, or a lack of distinct visual features.

Third conductor of the AC cord is a functional earth. To avoid risk of electric shock, this equipment must only be connected to a supply mains with protective earth.

At no time should liquid products be allowed near any device component.

No modification of this equipment is allowed.

Use of accessories, transducers, and cables other than those specified or provided by the manufacturer of this equipment could result in increased electromagnetic emissions or decreased electromagnetic immunity of this equipment and result in improper operation.

Portable RF communications equipment (including peripherals such as antenna cables, external antennas, smart watches, and mobiles devices) should be used no closer than 30 cm (12 inches) to any part of REAL y-Series, including cables specified by the manufacturer. Otherwise, degradation of the performance of this equipment could result.

Use of REAL y-Series adjacent to or stacked with other equipment should be avoided because it could result in improper operation. If such use is necessary, this equipment and the other equipment should be observed to verify that they are operating normally.

Accessories such as power adapters and cords should not be replaced by the end user and should only be replaced by Penumbra. Any changes or replacements of accessories will likely impact compliance of REAL y-Series.

Use of system with online configuration should be in a secure information technology environment. Https communication channels must be open.

POTENTIAL ADVERSE EFFECTS/EVENTS

Visual stimulation through head-mounted displays has a small possibility of provoking an epileptic seizure. Should this occur, stop using the device immediately. Other possible complications include, but are not limited to, the following:

- claustrophobia
- discomfort or pain in the head or eyes
- disorientation/vertigo/dizziness
- drowsiness
- eye strain
- falls or fractures
- headache/migraine
- insomnia
- light-headedness
- motion sickness
- nausea
- pain
- seizure
- repetitive strain injury
- vision problems
- skin irritation

Should any of the above occur, stop using the device immediately.

OPERATOR PROFILE

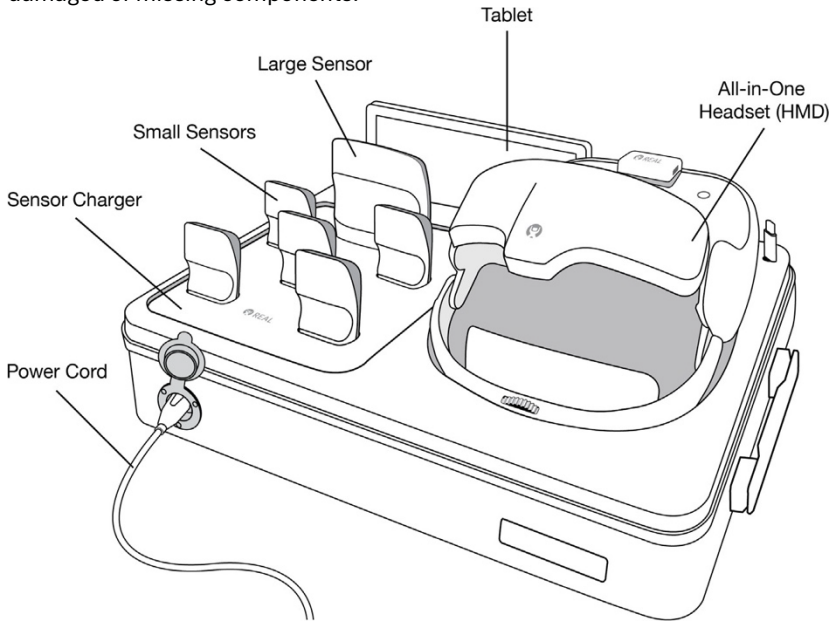
Operators of the REAL y-Series should be trained in rehabilitation therapy. Follow facility guidelines for use and access to account login credentials (if applicable). For systems with online configuration, the same account login credentials shall not be used by more than one REAL y-Series at any given time.

Note: These rehabilitation exercises and assessments are intended to be conducted in a clinical environment and prescribed and supervised by a medical professional trained in rehabilitation therapy. Rehabilitation therapy and technique decisions will vary based on the clinical judgement of the treating medical professional. A medical professional must be present at all times to provide direct supervision throughout the course of therapy.

OPERATING PROCEDURE

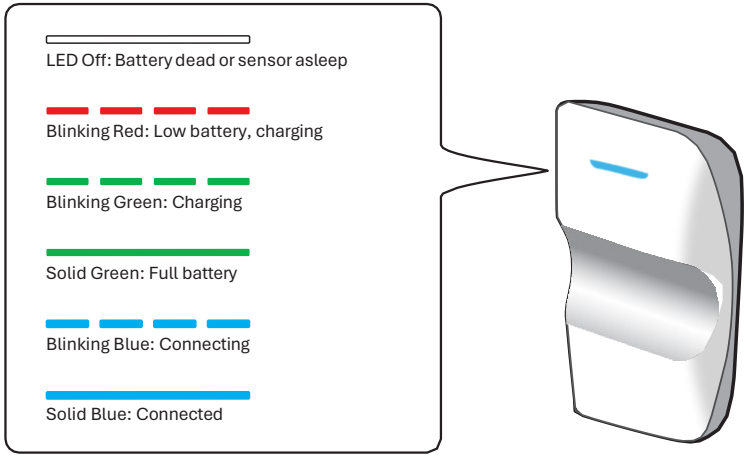
SECTION 1: GETTING STARTED AND CHARGING COMPONENTS

1. Remove REAL y-Series case from the shipping container and inspect for damaged or missing components.



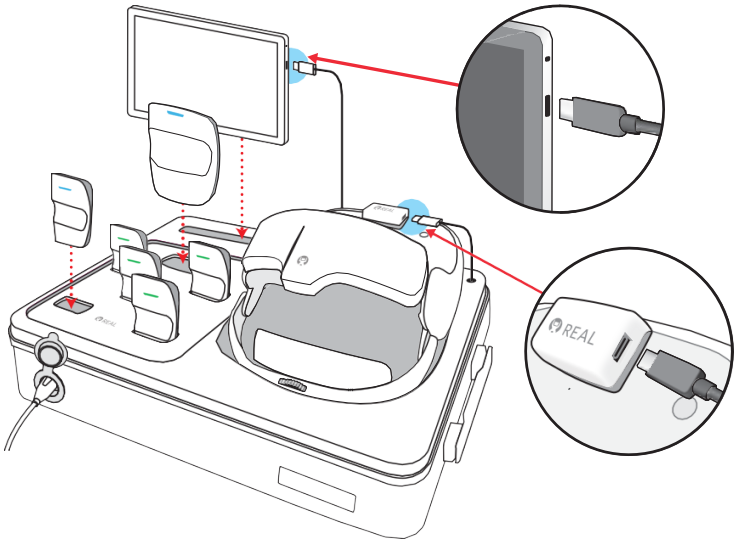
2. Connect the REAL y-Series case to its power cord (AC adapter power cord). Plug the power cord into a grounded electrical outlet, making sure that it is the same voltage as indicated on the unit nameplate. Ensure the power receptacle is connected to a supply mains with protective earth. Ensure the case lid is left open when charging components.

3. Ensure sensors with white sides facing forward are in their corresponding size slots on the sensor charger. LED lights on sensors will show the following:



4. Ensure the headset is connected to its power cord (USB-C cord). LED light on top of headset will show blinking red, blinking green or solid green to indicate charging status.

5. Ensure the tablet is connected to its power cord (USB-C cord).



SECTION 2: INTERNET CONNECTIVITY *(Online Configuration Only)*

Note: Prior to first time use, the REAL y-Series must be configured and connected to the local internet. To continue using the REAL y-Series over its lifespan, user may be prompted/required to complete over-the-air software updates.

See Get Connected Guide section in the REAL y-series Quick Start Guide for more detailed instructions. Continue to Section 3 when the system has secure internet connectivity.

Connecting to Wi-Fi

For a connection to Wi-Fi, it is recommended that steps provided below are performed by the facility's IT team. For remote technical support please contact the Penumbra Product Technical Support team 1.855.732.5797 (select Option 2) or realsupport@penumbrainc.com from Mon–Fri, 6 am – 6 pm PST.

1. Turn on tablet by pressing and holding down power button for approximately 5 seconds.
2. Launch the TherapyView application if it is not already open.
3. Press "OK" on the REAL Service prompt.
4. On the login page, click on the "Network Setup" button in the bottom right corner.
5. Connect using the desired wireless network name and password.
6. Press the button at the top left of the screen to return to the TherapyView application home screen.

SOFTWARE UPDATES

To receive over-the-air (OTA) software updates, REAL y-Series must be connected to a Wi-Fi network.

Online Configuration

1. Turn on the tablet and headset (HMD).
2. Ensure the tablet is connected to Wi-Fi*.
3. If required, follow prompts on the tablet.

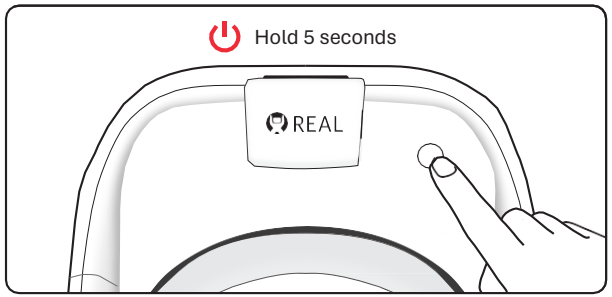
*Note: To connect your REAL y-Series online system to the Internet, refer to "Internet Connectivity" section.

Offline Configuration

Contact your local Penumbra representative or Penumbra Product Technical Support team for software updates.

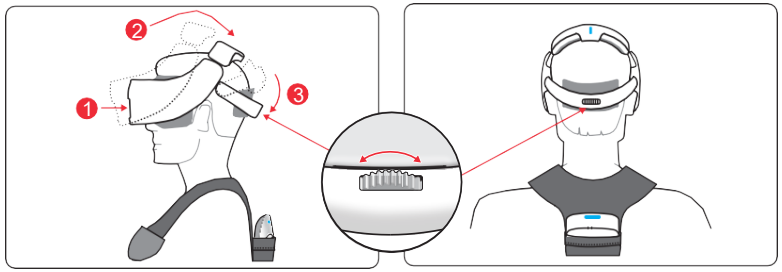
SECTION 3: START-UP SYSTEM FOR PATIENT USE

1. Unplug power cords from tablet and headset when ready to use and sufficiently charged.
2. If the tablet is not turned on, turn on.
3. Turn on the headset by pressing and holding the power button for approximately 5 seconds.

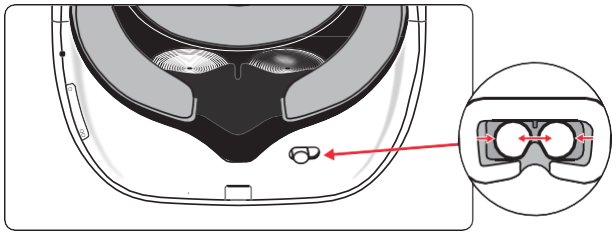


4. Place the headset on patient's head in the sequence numbered below. Size of headset strap can be adjusted for fit. Top of head pad may be removed temporarily for better fit. Patient can immediately begin visually interacting with the environment.

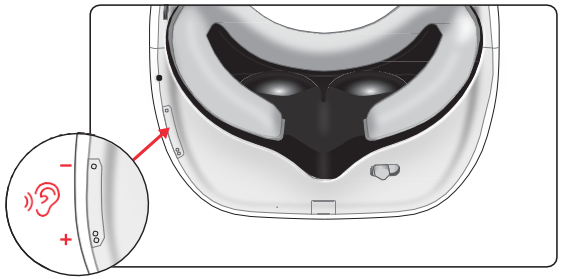
Note: Patient can keep eyeglasses on.



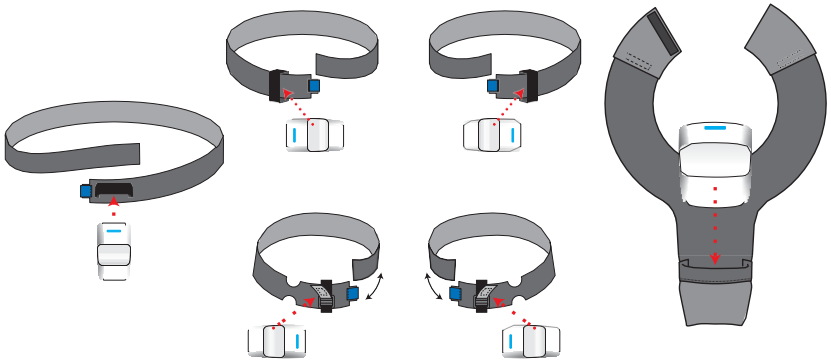
Note: To improve focus, you can use the interpupillary distance (IPD) slider on the bottom of the headset. Refer to the image below.



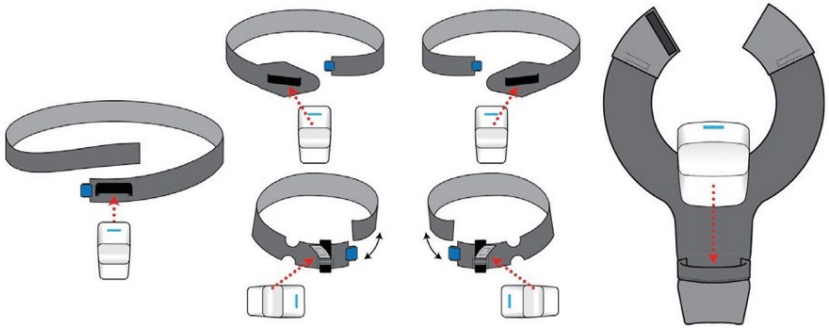
5. Confirm audio can be heard but does not block out the patient's ability to communicate; adjust volume on headset as needed.



6. Remove sensor bands from reusable packaging (sold separately) and note the catalog number on the product label. Each patient should have their own sensor bands.
7. Remove all sensors from sensor charger.
8. REAL y-Series has two sensor tracking options, upper and full body (default).
    - Sensor Band Catalog Code BND supports only upper body tracking.
    - Sensor Band Catalog Code BND1 supports both upper and full body tracking.
9. Place small sensors onto bands by sliding them into elasticized loops. For the hand sensor bands, tighten elasticized loop using the buckle. Place large sensor into pocket of shoulder band. Refer to catalog number for correct orientation.

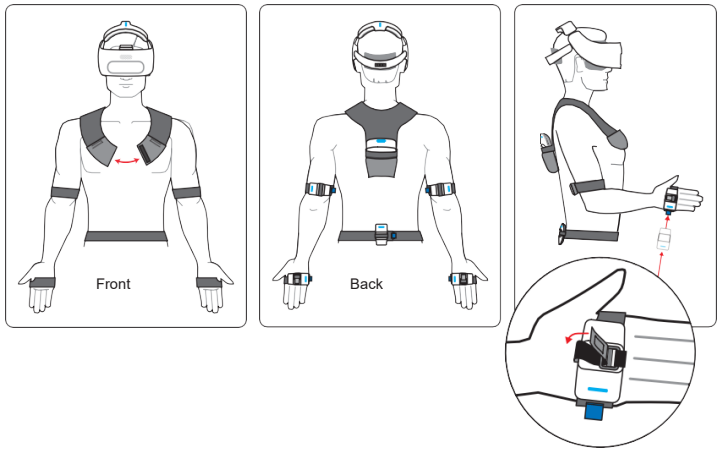


Catalog Number BND Sensor Orientation



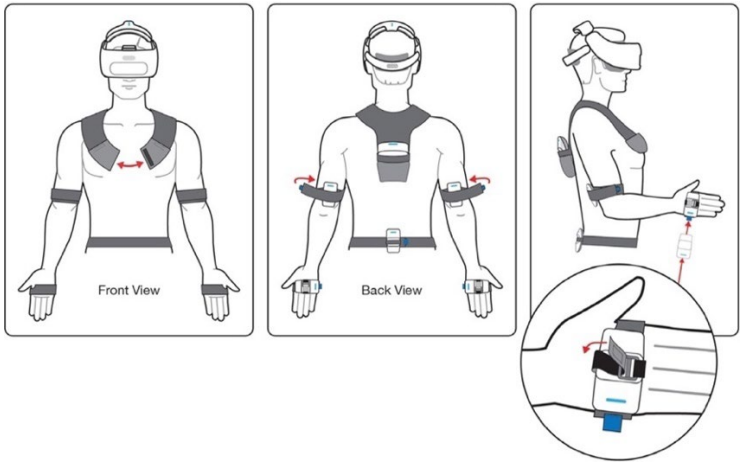
Catalog Number BND1 Sensor Orientation

10. Once sensors are placed in the bands, put each band onto its corresponding body part. See images below. Refer to catalog number for correct placement. Connect hook and loop fasteners of shoulder band if desired. Adjust bands for comfortable fit, if necessary. Ensure the waist band is worn at the sacrum of the back and the sensor is firmly secured and is centered on the back.



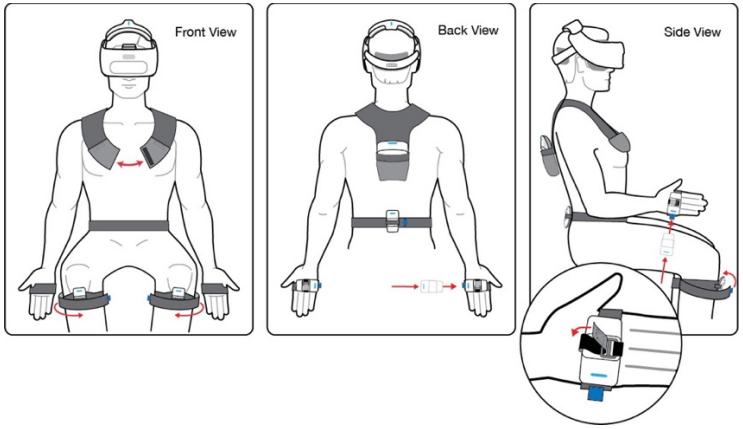
Catalog Number BND (Upper Body Only) Sensor Band Placement

Note: Ensure the elbow sensor is placed right above the elbow and opposite the bicep.



Catalog Number BND1 Sensor Band Placement for Upper Body Only

Note: Ensure the knee sensor band is placed right below the knee cap. Wrap the extra sensor band over the sensor to secure the sensor firmly.

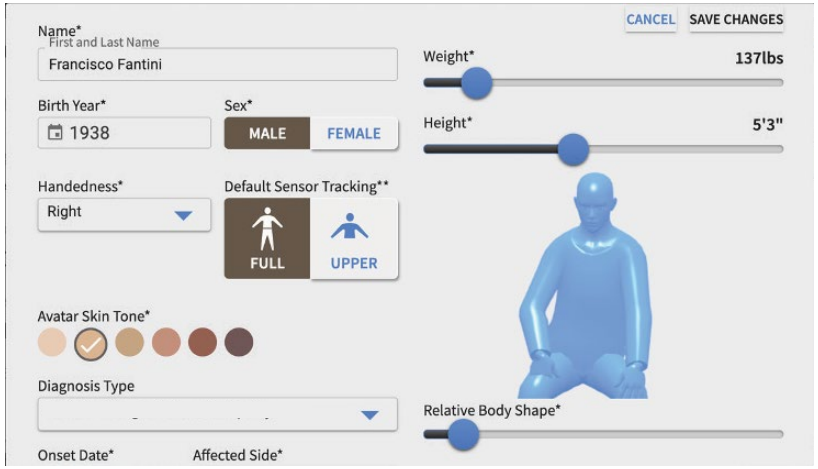


Catalog Number BND1 Sensor Band Placement for Full Body

11. Launch the TherapyView application if it is not already open.

12. ***Online Configurations***
    i. Select the “Sign In” button and enter your TherapyView credentials.
    ii. Add a new patient or select existing patient from patient list.
    iii. Enter or edit patient information, avatar settings, and sensor tracking to match your patient as needed.

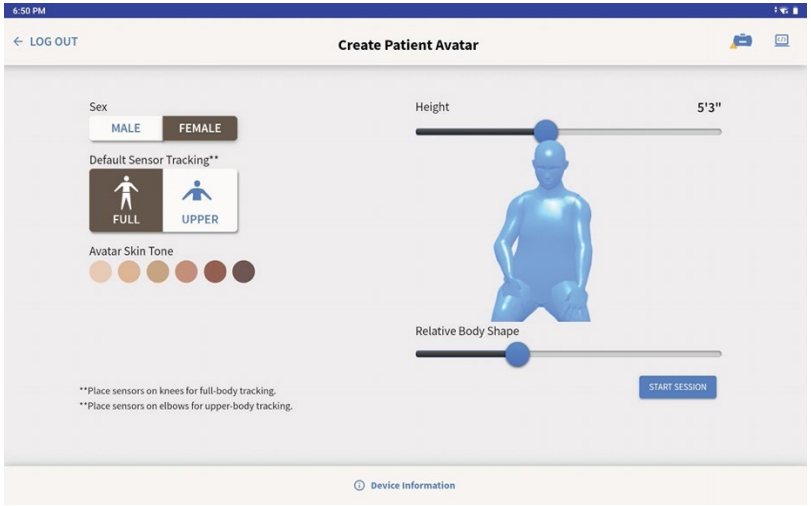
Note: Patient information and avatar settings will be saved to the patient’s TherapyView profile for subsequent sessions. Session history will also be available for therapist review.



Offline Configurations

i. Select “Start Now” button.
ii. Enter patient information, avatar settings and sensor tracking to match your patient as needed.
iii. Select “Start Session.”

Note: Patient information and avatar settings are not saved.

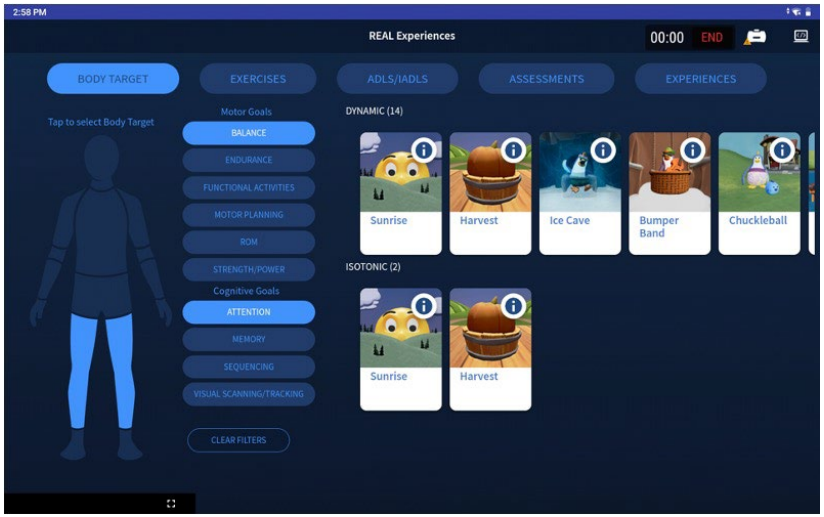


13. Once a patient is selected or created, initiate the session by pressing “Start Session.”

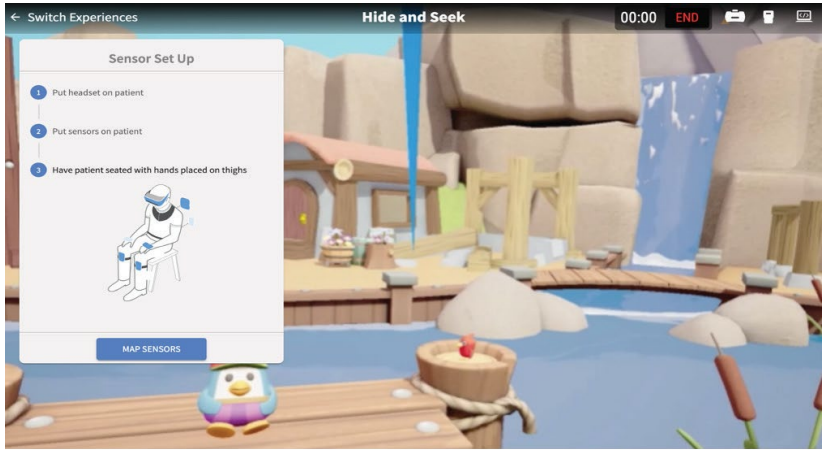
SECTION 4: MANAGING A THERAPEUTIC OR WELLNESS SESSION

1. On the TherapyView selection screen, choose a therapy, experience, activity or assessment by selecting one of the following options available at the top of the screen.

- **Body Target:** Filter activities by area of focus, motor goals, and/or cognitive goals
  - Choose desired areas of focus by tapping the parts of the avatar’s body, ‘Motor Goals’, and/or ‘Cognitive Goals’ options.
  - Choose the desired activity from the list by selecting the activity card or the “i” icon and select “Run.”
- **Exercises:** Filter by exercise to find the desired activity
  - Choose your preferred exercise by tapping on the exercise to the left of the screen.
  - Choose the desired activity from the list by selecting the activity card or the “i” icon and pressing “Run.”
- **ADLs/IADLs:** Filter activity by ADLs/IADLs
  - Choose the desired activity from the list by selecting the “i” icon and selecting “Run.”
- **Assessment:** View all available assessments
  - Choose the desired assessment from the list by selecting the assessment card or the “i” icon and select “Run.”
- **Experiences:** View all available REAL y-Series experiences
  - Choose the desired experience by selecting the experience card or the “i” icon and select “Run.”

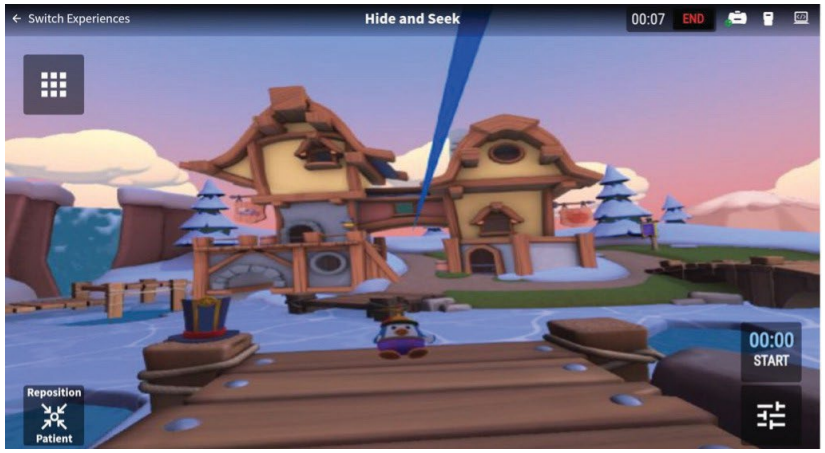


2. Have the patient sit in a neutral position away from metal components, facing forward with hands on thighs in an upright position and knees in a right-angled position to the floor. Press the button on the tablet screen to map the sensors.



3. Confirm patient's avatar in virtual environment corresponds to patient's physical movement. If the avatar looks correct, press "Continue". If not, remap the sensors by selecting "Remap Sensors."

4. Press "Start" to begin an activity. You may also use the TherapyView selection screen to select a new activity, experience, or assessment.
(See Section 6 for more details about therapeutic and wellness experiences).



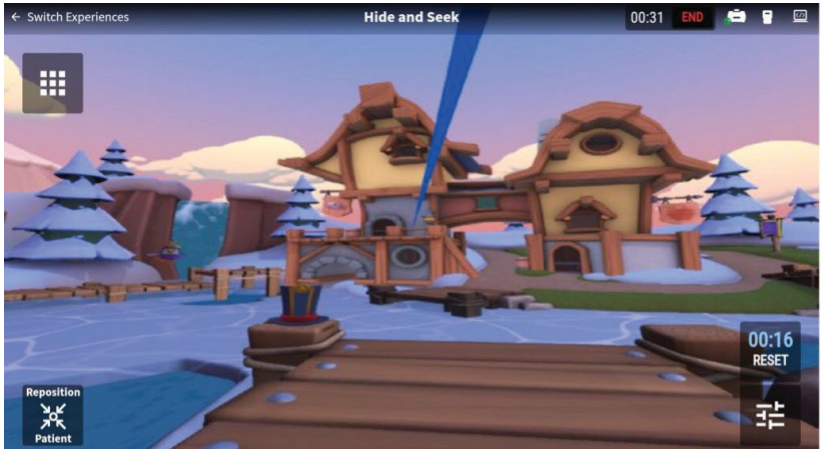
5. Always remain with the patient throughout therapy session to provide direct supervision.

6. Monitor patient view on tablet; select and begin new experiences or activities as desired.

   Note: After 20 minutes of inactivity in TherapyView, the user will be automatically logged out of the TherapyView application. To start a new session, exit out of TherapyView completely and return to step 12 in Section 3.

   Note: If sensors lose synchronization or headset loses tracking, reset the entire system. Headset should be turned off and on using the power button. TherapyView application should be relaunched on the tablet. Sensors should be reset by placing them in the powered charging station (while the REAL y-Series is plugged in) and then removing them.

7. When planned therapy session is complete, press "End" on tablet.



8. Assess patient progress by reviewing objective measures from activities and/or assessments. Activity measures including such as utilization data, sit-to-stand transfers, full body measures, balance, assessment measures, lower body isotonic exercise measures, and functional range of motion.

   Online Configuration Only: *Patient information and avatar settings will be saved to the patient's profile for subsequent sessions. Previous patient sessions are available for review in addition to the most recent session.*

SECTION 5: SYSTEM REMOVAL

1. Remove sensors and bands.
2. Remove headset from patient's head.
3. Power off headset by pressing and holding onto the power button for approximately 5 seconds.
4. Log out of the TherapyView application.
5. All system components (or patient contacting components) can be wiped down with an institutional approved sanitizing wipe* as needed between sessions.
6. Ensure REAL y-Series Case is plugged in.
7. Connect tablet and headset to their respective power cords. Red or green LEDs should be noted on the headset.
8. Return all sensors to sensor charger. Red or green LEDs should be noted on sensors when placed correctly in the charging station.
9. Sufficiently charge all components after each use and prior to next use for a minimum of 60 minutes.

Note: Standard operation is to power cycle and relaunch the system between therapy sessions to re-establish system connections.

* Do not use petroleum-based compounds, acids, caustics, or chlorinated solvents to clean or lubricate any parts. Use water-based solvents for cleaning. Handle the lenses on the headset carefully to avoid smears or scratches. Wipe lenses with a soft cloth for cleaning. Ultraviolet C (UVC) cleaners may be used to clean plastic components of the headset and sensors. Ensure headset lenses are covered if using a UVC cleaner. Please check with the UVC cleaner manufacturer for effectiveness and possible damage to the sensors' plastic. Damage to the plastic components due to UV light exposure is not covered by warranty.

REAL y-Series Travel Case Instructions:
REAL y-Series is housed in a travel case that may be locked with the attached combination lock that secures the zipper. The combination lock should be turned to the red dot position at all times. If the combination lock is turned away from the red dot, turn it to the red dot position.

How to reset the combination lock:

1. Set all combination dials to the following: (0-0-0 default).
2. Find the hole located to the right of the dials. Use a paper clip or similar tool to press down on the reset button until an audible “click” is heard.
3. Set personal combination by turning the dials to display the desired set of numbers, e.g. 2-8-7.
4. Push the slide button located on the left of the dials towards the direction of the arrow and the reset button will push back up. An audible “click” will be heard.
5. Remember the personal combination. If reset is necessary, set the dials to the previous set combination and repeat steps 2 to 4 above.

How to use the combination lock:

1. To unlock: Turn the dials to the correct combination. Push the slide button on the left of the dial towards the direction of the arrow to unlock.
2. To lock: Put the loop portion of the zipper into the slots of the lock, then turn the dials randomly to conceal the personal combination to lock.

SECTION 6: SOFTWARE DESCRIPTION

REAL y-Series contains a variety of activities that incorporate clinically recognized, existing therapeutic, functional, and wellness exercises to facilitate motor learning, cognitive function, memory, and relaxation. Activities are grouped into experiences that offer a similar environment, typically for one or more activities. REAL y-Series also offers in-VR assessments that reflect clinically recognized assessments. Settings for activities involve parameters such as turning on and off avatar features and environmental factors. While using the REAL y-Series, the clinician remains responsible for the patient’s safety and the appropriateness of individual exercises, including range of motion (ROM) attempts and any other limb or joint limitations unique to that patient.

REAL Home with Assessments

REAL Home is a peaceful, serene lakeside experience to acclimate patients to Virtual Reality (VR). It is also the entry point for a suite of balance and functional assessments.

Functional Reach™

Assess a patient's functional reach in a standing position. Inspired by standard functional reach assessment.

Instructions:

Setup: Ask the patient to stand with their back straight and feet hip-distance apart. Place feet at the position indicated in blue in the headset.

Calibration: Ask the patient to extend either the right or left arm at the position indicated by a shadow arm and hold for 5 seconds.

Assessment: A ruler and butterfly/bubble will appear. Ask your patient to reach for the butterfly/bubble by stretching their arm as far as they can safely without taking a step.

Measures: A reach measure will automatically be detected when the patient retracts their arm. Press “Stop” on the TherapyView screen to accept the reach measurements. You can also reject the result by tapping “Tap to Reject” option on TherapyView.

Static Stance™

Assess a patient’s standing balance capabilities in various standing stances.

Instructions:

Setup: Choose desired stance when prompted on TherapyView

Assessment: Ask the patient to stand and follow the different stances shown by a prompt in the headset. Place feet at the position indicated in the headset. Press “Start” to begin the assessment. Hold stance for a desired amount of time. Once complete, press “Stop” on the tablet to register the measurements.

Measures: Hold time and sway-related measures will be generated after pressing stop.

Happy Valley™

Happy Valley is designed to support physical rehabilitation, cognitive function, and wellness immersing the patient in a delightful world of penguins. Happy Valley includes a total of 18 therapeutic and wellness activities.

Activity	Catch & Glow™	Hide & Seek™	Mad Tavern™
Goal	Exercise visual scanning, gaze stability and cervical ROM.		
How to perform the activity	Use the blue line pointer to help a penguin catch fireflies in a specific pattern.	Look for the penguin with the propeller hat on using the blue line pointer.	Use your neck movement to hover the blue line pointer over each character to wake them up.

Hot Air Balloon Activities

Activity	Bumper Band™	Balloon Pilot™	Summit Rescue™
Goal	Focus on trunk mobility and core control.		
How to perform the activity	Move your torso in all directions to bump the small balloons.	Move torso in all directions to move the balloon to hit the trees and knock off the apples to feed the pigs.	Move torso forward and backward to move the balloon to rescue the characters.

Sunrise™ Activities

Activity	Ice Cave™	Sunrise™	Harvest™
Goal	Focus on trunk mobility and core control.		
How to perform the activity	Melt the ice by lifting and setting the sun. Lift the sun by raising your arms or lower legs. Set it by lowering your arms or lower legs to starting position.	Lift the sun by raising your arms or lower legs. Set it by lowering your arms or lower legs to starting position.	Grow vegetables by lifting and setting the sun. Lift the sun by raising your arms or lower legs. Set it by lowering your arms or lower legs to starting position.

Bird Forest Activities

Activity	Free Birds™	Nest Hop™	Bird Match™
Goal	Work on dynamic reaching, functional reach, and wrist ROM.		
How to perform the activity	Use either hand to pick up and place individual birds into nests with unique objects.	Use either hand to pick up and place a bird into a series of nests.	Pick up a brightly colored bird, locate the nest with a matching ribbon, and place the bird in nest.

Sports Park Activities

Activity	Chuckleball™	Chuckleball Arena™	Flying Fish™
Goal	Focus on functional movement, dynamic reaching, reactive movement and reflexes.		
How to perform the activity	Use hands, head, or legs to block blue fish.	Block blue fish with hands, head, or legs to defend your goal and hit fish into the opposing goal.	Block blue fish with hands, head, or legs and dodge red spiky fish.

Creative Canvas Activities

Activity	Paint by Number™	Free Stamp™	Free Paint™
Goal	Exercise visual scanning, gaze stability and cervical ROM.		
How to perform the activity	Use either hand or the blue line pointer to control a paint brush and match the number to the color.	Use either hand to stamp selected images on virtual canvas backgrounds.	Use either hand to freely express artistic creativity on virtual backgrounds. Choose Blank Canvas or Coloring Book modes.

Island Antics™

Island Antics experience is designed for patients who need to work on upper body reconditioning and motor functions. It transports patients to a city of antics where they get to be a celebrated hero tasked to help island citizens using multi-directional movements to complete tasks.

Activity	Save the Seagull™	Citizen Crossing™
Goal	Use and work on trunk control, functional reach, and cross body motions.	Engineered to improve trunk control, functional reach, and dynamic balance.
How to perform the activity	Grab the small UFOs like a frisbee, follow the path in front of you, and release.	Use your hand to pick the citizen up and guide it along the path connecting the two buildings.

Activity	Leaks & Levers™	Coconut Chuck™
Goal	Use and work on your shoulder flexion and extension.	Exercise functional reach and trunk movement.
How to perform the activity	Follow the path to move the lever, wheel, or pulley using your hands.	Use your hands to reach out and pull the handle in front of you to shoot the coconut on to the boats.

Mindful Market™

Welcome to Mindful Market, where patients can emphasize high-level cognitive skills, performing instrumental ADLs (Activities of Daily Living), and stimuli tolerance, in an engaging, lively marketplace. Recover executive functions, working memory, sequencing and sorting abilities, and resilience to stimulation by volunteering at multiple small businesses in the charming market square.

Activity	Sandwich Shop™	Harvest Helper™	Stamp Stand™
Goal	Help build sequencing and working memory skills.		
How to perform the activity	Choose the correct ingredients to make the customer's desired sandwich.	Lift your hands and catch the object thrown and place the object on the matching pallet.	Choose the correct quantity of stamp sheets to match the customer's designated budget.

Music in Motion™

Music in Motion is an entertaining music-themed VR rehabilitation experience designed for upper & lower extremity and cognitive rehabilitation.

Activity	Song Safari™	Lean into the Music™	Reach for the Rhythm™
Goal	Focus on neck and cervical movements.	Use cervical ROM, trunk and core control.	Utilize shoulder ROM & trunk control.
How to perform the activity	Spot candy critters by holding the blue line pointer on the critter hiding in the environment.	Lean from side to side and move your head up and down to steer the bird to hit the targets.	Use your right or left hand to hit the blue or red targets respectively.

Activity	Turn with the Tempo™	Step to the Beat™
Goal	Engage wrist and shoulder ROM.	Exercise knee & hip ROM.
How to perform the activity	Match the angle of the music note using your right or left hand for the blue or red notes respectively.	Use your right and left feet to step on the blue and red targets respectively.

Pleasant Cove™

Pleasant Cove focuses on the mental wellness component of therapy for patients recovering cognitive skills while providing options for the therapist to address rehabilitation goals through more directed, stress-relieving experiences.

Activity	Bountiful Birdseed™	Playful Percussion™
Goal	Work on sustained attention and wrist ROM.	Focus on sequencing, psychomotor skills, and working memory.
How to perform the activity	Shake the seeds into the pink circle to feed the bird. Extend your hand.	Using the mallets, follow the pink arrow and hit each note to complete a song.

Activity	Green Thumb Gardening™	ADL Cards™
Goal	Use object recognition, shoulder, and wrist ROM.	Focus on sequencing, object identification, and memory.
How to perform the activity	Grow flowers by picking up the equipment around you.	Practice ADLs by interacting with ADL-based cards. Choose from different modes: Item Find, Sequencing, or Sorting.

REAL Pinball™

Aim for your highest scores in this fast-paced, pinball experience that supports range of motion, processing speeds, muscle tone & endurance, control of voluntary movement functions, neuromusculoskeletal skills, and psychomotor skills.

Activity	Carnival Blast™	Alien Arrival™	Magical Garden™
Goal	Engineered to improve upper or lower body range of motion.		
How to perform the activity	Use arms or legs to hit and block ball using different control methods such as kayak paddle, pong, rackets, foot flippers or gaze control.		

Virtual Athletic Club™

Virtual Athletic club is a high paced and engaging experience that motivates patients to focus on upper body compound exercises and reactive movement. Activities in this futuristic athletic club are designed to challenge and improve upper extremity strength and endurance.

Activity	Bionic Bow™	Paddle Pong™	Power Punch™
Goal	Focus on upper body ROM & strengthening in an archery activity.	Work on upper body ROM and reactive movements.	Work on upper body endurance and strengthening in a futuristic boxing activity.
How to perform the activity	Use one hand to grasp the bow and hold it upright. Use the other hand to hold the bowstring. Aim the bow at the target in front of you, then release the bowstring to shoot the target.	Use one or both hands to hit the balls at the launch pad. When the ball is successfully hit, additional balls are added to the mix.	Move your arms to punch the targets coming towards you. If a red or green target with arrows appear, twist your torso in direction of the arrows and punch the target with the matching glove color.

REAL Life™

Practice activities of daily living (ADLs) in this supportive, virtual environment. Clinicians can utilize REAL Life to rebuild patient confidence and practice performing ADLs, such as bathing. Immersed in a calm and relaxing environment, patients are encouraged to engage in activities that promote independent living.

Activity	Shower Sanctuary™
Goal	Designed to teach or practice bathing exercises.
How to perform the activity	Turn on the shower, pick up the shower head. Once wet, turn off the shower and pick the soap from the right side of the tub and lather it over your body. Next, reach for the shampoo on the left side of the tub. Squeeze the bottle and rub the shampoo in your hair. Turn on the shower to rinse the soap. Pick up the towel to dry yourself.

Under the Sea™

Focus on lower body strength and endurance in a tranquil underwater environment.

Activity	Undersea Garden™	Coral Revival™
Goal	Visually scan to interact with a peaceful underwater environment.	Revitalize coral reef by completing a variety of exercises.
How to perform the activity	Gaze at different sea creatures and objects to interact with them.	Aim the cannon at bleached coral while performing a movement. Complete the exercise by returning to the starting position to shoot and heal the targeted coral.

Activity	Treasure Hunt™	Ruin Reveal™
Goal	Direct a submarine and retrieve underwater treasures by performing various exercises.	Discover an ancient underwater kingdom by working on diverse exercises.
How to perform the activity	Move the submarine scooper using head movements. Perform the exercise and hold to activate the scooper. Complete the exercise by returning to the starting position to collect the treasure.	Aim the cannon at the ancient walls while performing a movement. Complete the exercise by returning to the starting position to shatter the walls.

Float™

Engage in intentional movements and mindfulness in a light-hearted environment.

Activity	Warm-Up™	Gifting™	Meditation™
Goal	Gently warm up by mirroring simple movements led by a glowing orb.	Gift Floaties by choosing different fashion accessories.	Follow a guided meditation session to practice mindfulness.
How to perform the activity	Follow the avatar/orb through warm-up exercises using your arms and/or neck.	Move your head to select a Floatie, and then use your hands to choose an accessory.	Find a comfortable position and follow an instructor-led guided meditation session.

Activity	Breathing™	Petting™	Tai Chi™
Goal	Follow a Floatie through guided breathwork training.	Use functional reach to pet the Floatie.	Practice slow intentional movements with a Floatie.
How to perform the activity	Find a comfortable position and follow a Floatie-led breathwork session.	Use your hands to pet a Floatie at specific areas indicated on the screen.	Use your arms to mirror the Floatie through slow intentional tai chi movements.

TECHNICAL SPECIFICATIONS

Sensor Accuracy*	± 2 cm at a max distance of 75 cm
Sensor Precision*	2 cm or less
Latency	≤35 milliseconds
Operating Temperature	15°C to 30°C (59°F to 86°F)
Operating Pressure	102 kPa or less
Operating Relative Humidity	30% to 90%
Operating Elevation	2,500 meters or less
Radio Module	Output power (EIRP*): 6.31 mW (8 dBm) max Frequency Band: ISM (Industrial, Scientific, and Medical) Typical Center frequency: 2.44 GHz Channel: 77 channels Bandwidth: 2 MHz per channel Modulation: GFSK (Gaussian frequency-shift keying) Data flow: Bi-directional *EIRP = Equivalent Isotropically Radiated Power

*REAL y-Series is calibrated appropriately to detect movement in virtual reality space in relation to real space accurately and precisely. Sensors will compute and display position at an accuracy of a 2 cm radius with respect to real space at a max distance of 75 cm relative to the headset. Sensors will also reproducibly compute position at a maximum deviation of a 2 cm radius for repeated movements at a max distance of 75 cm relative to the headset. Please note that accuracy and precision specifications contain limitations and are dependent on certain factors such as the amount of metal near the system. For example, if the patient is in a metal wheelchair and cannot move to a non-metal chair, reduction in accuracy and precision may occur.

SYMBOL GLOSSARY

	Refer to User Guide (Instruction Manual)
Rx Only	Prescription only – US Federal Law restricts this device to use by or on the order of a physician
	Type BF Applied Part
	WEEE
	Manufacturer
REF	Catalog Number
LOT	Lot Number
	Date of Manufacture
	Alternating Current
	Both Direct and Alternating Current
	Class II Equipment
SN	Serial Number
ETL CLASSIFIED C US Intertek	US and Canada Certification
MD	Medical Device

TECHNICAL INFORMATION

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

Emissions Test	Compliance	
RF emissions CISPR 11	Group 1	REAL y-Series 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 B	REAL y-Series is suitable for use in all establishments, including domestic establishments 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	Complies	

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

Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environment – guidance
Electrostatic discharge (ESD) IEC 61000-4-2	±8 kV contact ±15 kV air	±8 kV contact ±15 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 differential mode ±2 kV common mode	±1 kV differential mode ±2 kV common mode	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	Voltage Dips 30% reduction, 25/30 periods At 0°	Voltage Dips 30% reduction, 25/30 periods At 0°	Mains power quality should be that of a typical commercial or hospital environment. If the user of the EQUIPMENT requires continued operation during power mains interruptions, it is recommended that REAL y-Series be powered from an uninterruptible power supply or a battery.
	Voltage Dips > 95% reduction, 0.5 period At 0°, 45°, 90°, 135°, 180°, 225°, 270° and 315°	Voltage Dips > 95% reduction, 0.5 period At 0°, 45°, 90°, 135°, 180°, 225°, 270° and 315°	
	Voltage Dips > 95% reduction, 1 period At 0°	Voltage Dips > 95% reduction, 1 period At 0°	
	Voltage Interruptions > 95% reduction, 250/300 periods	Voltage Interruptions > 95% reduction, 250/300 periods	
(50/60 Hz) magnetic field IEC 61000-4-8	30 A/m	30 A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.

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

Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environment – guidance
Conducted RF IEC 61000-4-6	3 Vrms 150 kHz to 80 MHz (6 Vrms in ISM radio Bands within 150kHz – 80MHz)	3 Vrms	Portable and mobile RF communications equipment should be used no closer to any part of REAL y-Series, 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 2.7 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[a], should be less than the compliance level in each frequency range[b].
Radiated RF IEC 61000-4-3	10 V/m 80 MHz to 2.7 GHz	10 V/m	

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 REAL y-Series is used exceeds the applicable RF compliance level above, REAL y-Series should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as reorienting or relocating REAL y-Series.
b) Over the frequency range 150 kHz to 80 MHz, field strengths should be less than 3 V/m.

Recommended separation distances between portable and mobile RF communications equipment and REAL y-Series

REAL y-Series is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of REAL y-Series can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and REAL y-Series 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 2.7 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.

Immunity to RF Wireless Communications Equipment

Test Frequency (MHz)	Band a) (MHz)	Service a)	Modulation b)	Maximum Power (W)	Distance (m)	IMMUNITY TEST LEVEL (V/m)
385	380–390	TETRA 400	Pulse modulation b) 18 Hz	1.8	0.3	27
450	430–470	GMRS 460, FRS 460	FM c) ±5 kHz deviation 1 kHz sine	2	0.3	28
710	704–787	LTE Band 13, 17	Pulse modulation b) 217 Hz	0.2	0.3	9
745						
780						
810	800–960	GSM 800/900, TETRA 800, iDEN 820, CDMA 850, LTE Band 5	Pulse modulation b) 18 Hz	2	0.3	28
870						
930						
1720	1700–1990	GSM 1800; CDMA 1900; GSM 1900; DECT; LTE Band 1, 3, 4, 25; UMTS	Pulse modulation b) 217 Hz	2	0.3	28
1845						
1970						
2450	2400–2570	Bluetooth, WLAN, 802.11 b/g/n, RFID 2450, LTE Band 7	Pulse modulation b) 217 Hz	2	0.3	28
5240	5100–5800	WLAN 802.11 a/n	Pulse modulation b) 217 Hz	0.2	0.3	9
5500						
5785						

a) For some services, only the uplink frequencies are included.
b) The carrier shall be modulated using a 50% duty cycle square wave signal.
c) As an alternative to FM modulation, 50% pulse modulation at 18 Hz may be used because while it does not represent actual modulation, it would be worst case.

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

This device contains license-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's license-exempt RSS(s). Operation is subject to the following two conditions:

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

L'émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :

1. L'appareil ne doit pas produire de brouillage ;
2. L'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Les changements ou les modifications qui n'ont pas été expressément approuvés par la partie responsable de la conformité peuvent faire perdre à l'utilisateur son droit d'utiliser l'appareil.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a residential setting. 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. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

— Reorient or relocate the receiving antenna.
— Increase the separation between the equipment and receiver.
— Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
— Consult the dealer or an experienced radio/TV technician for help.

Mode of Operation:
Charging mode and battery mode

Highest Clock Frequency:
HMD: 32 MHz
WSM: 32 MHz
WTM: 24.576 MHz

Frequency Range:
2402 MHz – 2479 MHz

Transmitting Frequency and Modulation:
Gaussian Frequency-shift Keying (GFSK) modulation. 2 Mbps modulation for all transmitter frequencies.

Antenna Make, Model, and Gain:

Device	Antenna Make	Antenna Model	Antenna Gain	
WSM	Johanson	P/N 2450AT43B100E	Peak Gain Average Gain	1.3 dBi -0.5 dBi
WTM				
HMD	Penumbra, Inc.	P/N 17107	Peak Gain Average Gain	0.7 dBi -2.6 dBi

Power Output and Data Rate:

Device	Power Output	Data Rate
WSM	Programmed by the firmware to +8 dBm.	GFSK modulation, 2 Mbps data rate.
WTM	Programmed by the firmware to +4 dBm.	
HMD	Programmed by the firmware to +8 dBm.	

Product availability varies by country.

Manufacturer:
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