



CoMoveIT

CoMoveIT Smart

Specialty Input Head-Foot Control Device for Powered Wheelchairs



CoMoveIT Smart
Instructions for Use



How to contact CoMoveIT

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Specialty input head-foot control device for powered wheelchairs

Produced and published by CoMoveIT, Belgium

Version 1.0, 2022-02-23

Article no.: CM0001-IFU-EN

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Important information about these Instructions for Use

We congratulate you on your choice of a CoMoveIT product. Our goal is for you to be satisfied with your choice of both vendor and product.

Before using this product, it is important to read and understand the content of these Instructions for Use and in particular the Safety Instructions.

The Instructions for Use clarify the functions and characteristics of CoMoveIT Smart and how you can use it in the best way. They also contain important safety and maintenance information, as well as describe possible issues that could arise during use.

Always keep these Instructions for Use handy in connection with your wheelchair.

It is also possible to obtain information concerning our products on www.comoveit.com.

All information, pictures, illustrations, and specifications are based upon the product information that was available at the time that these Instructions for Use were printed. Pictures and illustrations that are found in these Instructions for Use are representative examples and are not intended to be exact depictions of the various parts of CoMoveIT Smart.

CoMoveIT reserves the right to make changes to the product without prior notice.

Ordering of documentation

If you need another copy of this Instruction for Use document, it can be ordered from CoMoveIT via info@comoveit.com, by asking for item CM0001-IFU-EN.

Serious incidents

SERIOUS INCIDENTS

In case of adverse or serious incidents causing human injury, you should contact CoMoveIT at vigilance@comoveit.com or your local distributor as soon as possible.

Always state the serial number of the device when contacting CoMoveIT to ensure that the correct information is provided.

Support, scrapping and spare parts

TECHNICAL SUPPORT

In the event of technical problems, you should contact your local distributor or CoMoveIT at +32 477 880 175 or via info@comoveit.com.

Always state the serial number of the device when contacting CoMoveIT to ensure that the correct information is provided.

SPARE PARTS & ACCESSORIES

Spare parts, consumables and accessories must be ordered through your local distributor.

SCRAPPING CoMoveIT Smart

Contact your local distributor or CoMoveIT for information about scrapping agreements in force.



Warranty

WARRANTY

CoMoveIT warrants CoMoveIT Smart to be free from defects in material and workmanship for a period of two years under proper use, care, and service.

All warranties will cover parts only and do not extend beyond the initial purchaser from an authorized CoMoveIT distributor. Normal wear and tear and consumables are always excluded from the warranty.

Commencement of Warranty Period

The warranty of CoMoveIT Smart begins on the date that the product is first delivered to the customer, or forty (40) days from the date that the product is shipped to the authorized distributor by CoMoveIT, whichever comes first.

Repair or Replacement

For warranty service, customers should contact the authorized distributor from whom the product was purchased. In the event of a defect in material or workmanship, the distributor must obtain a return authorization number from CoMoveIT, and the product must be shipped to a service center designated by CoMoveIT. The distributor will repair or replace any product covered by the warranty. This warranty does not include any labor charges or shipping charges incurred in replacement for installation or repair and any such product.

WARRANTY

Amendments

No person is authorized to change, extend, or waive the warranties of CoMoveIT. An original document, countersigned by the party or parties concerned must be received by CoMoveIT before any amendment takes effect. This warranty shall be extended as necessary to comply with state laws and requirements.

Voiding of Warranties

The above-mentioned warranties are depended to proper use, maintenance, and care of the product. The warranty will be void if the product has been used improperly or if it has been repaired or any part replaced by persons other than CoMoveIT or an authorized CoMoveIT distributor.


The addition of equipment, peripherals or features that are not manufactured or recommended by CoMoveIT could affect the intended function of CoMoveIT Smart product.


The use or installation of equipment not issued or accepted by CoMoveIT invalidate the warranty.

Safety Rules

Warning labels

These Instructions for Use, utilize the following warning labels, which are intended to draw attention to situations that could lead to unwanted problems, personal injury, or damage to the wheelchair, etc.

	CAUTION!
Please use caution where this symbol appears.	

	WARNING!
Please use extreme caution where this warning symbol appears. Failure to observe warnings can lead to personal injury and property damage, including damage to the wheelchair.	

General

CoMoveIT Smart head-foot specialty control device for powered wheelchairs is intended to be fitted to any powered wheelchair equipped with R-net electronics.

Incorrect use may lead to risk of injury to the user and damage to the wheelchair or other property. In order to reduce these risks, it is imperative that you should read through this Instructions for Use carefully, paying particular attention to the safety instructions and the warning texts.

Any unauthorized use of CoMoveIT Smart may lead to increased risk of accident. Follow the recommendations in the Operation section carefully in order to prevent the risk of accidents from use.

All alterations to and interventions in the vital systems of CoMoveIT Smart must be performed by a qualified service engineer. In case of doubt, always contact CoMoveIT or a qualified service engineer of your local distributor.

All information and specifications included in this instruction manual applied at the time of delivery of this product. As CoMoveIT undertakes continuous development and improvement, we reserve the right to make changes without prior notification.

Contraindications

CoMoveIT Smart must not be used by individuals who have a severe mental disability, and they are not able to follow and understand basic instructions, are diagnosed with as severe visual impairment, or suffer from severe epilepsy.



CAUTION!

CoMoveIT accepts no liability for personal injury or property damage that may arise from the failure of the users to follow the indications, recommendations, warnings, cautions, and instructions given in this Instructions for Use document.



CAUTION!

Obsolete parts of CoMoveIT Smart should be responsibly disposed according to local recycling regulations.



CAUTION!

Electromagnetic Compatibility (EMC) requirements

The electronics of CoMoveIT Smart may be affected by external electromagnetic fields (e.g. mobile phones). The electronics of CoMoveIT Smart also emit electromagnetic fields that could affect surrounding devices.

The EMC threshold values are laid down in harmonized standards under Regulation (EU) 2017/745. CoMoveIT Smart meets or exceeds threshold values for electromagnetic immunity. CoMoveIT Smart meets or is below the limit threshold values for emitted electromagnetic fields.



CAUTION!

Maximal forces on the head

The head array of CoMoveIT Smart may be affected by extreme force applied by the user. The maximal forces applied in the head array in any direction are specified by CoMoveIT to be up to 205 Newtons.



Design and functions

General

CoMoveIT Smart head array is mounted to the rear of the powered wheelchair, while the foot pads are mounted on the existing footrest. The position of the head array, as well as its sensor pads, can be adjusted to optimize user performance for drive and control activities.

CoMoveIT Smart works together with the Rnet OMNI 2 control interface module or the Rnet Input Output control interface module to provide control of the power wheelchair instead of an ordinary control device.

The operation of the wheelchair and its functions are controlled by applying pressure with head and feet to activate the force sensor arrays.

Intended Purpose

CoMoveIT Smart is intended to be used as an input control device for powered wheelchairs. The intention of CoMoveIT Smart is to capture pressure applied by the user on the head and foot pads of the device and translate them into driving commands for the powered wheelchair. The intention of CoMoveIT Smart is also to adapt in real time the required pressure by the user in order to activate the wheelchair control system. CoMoveIT Smart is a plug and drive device that could offer independent mobility and relaxed way of powered wheelchair driving.

Users

CoMoveIT Smart users are amongst others, individuals diagnosed with complex movement disorders, such as dystonia and choreoathetosis in dyskinetic cerebral palsy, who lack the ability to operate powered wheelchairs using conventional control interfaces.

Head array adjustment mechanisms

The head array is adjustable to optimize its positioning based the needs of the user. The overall height of the head array can be adjusted using the rotary knob in Figure 1.

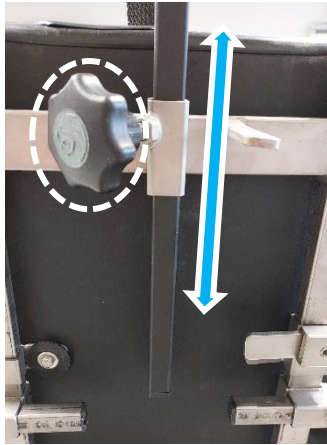


Figure 1. Rotary knob to adjust the height of the head array.

The depth of the head array can be adjusted via the rotary knob, which is positioned at the back. See Figure 2.

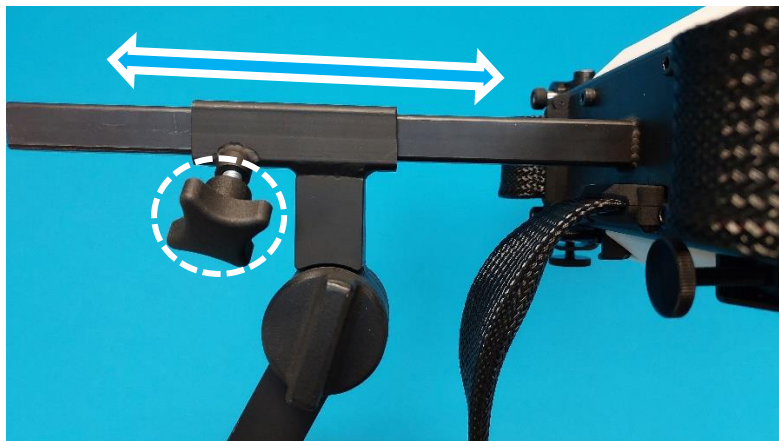


Figure 2. Rotary knob to adjust depth of the head array.

The inclination of the head array can be adjusted via the rotary knob which is positioned on the vertical adjuster. See Figure 3.

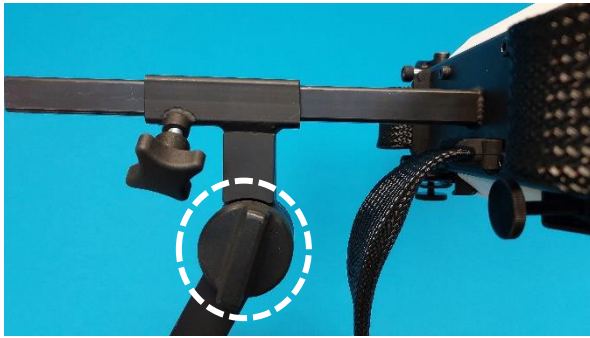


Figure 3. Rotary knob to adjust the inclination of the head array.

The opening angle of each of the side pads on the head array can be adjusted via rotary knobs positioned on the back as can be seen in Figure 4.

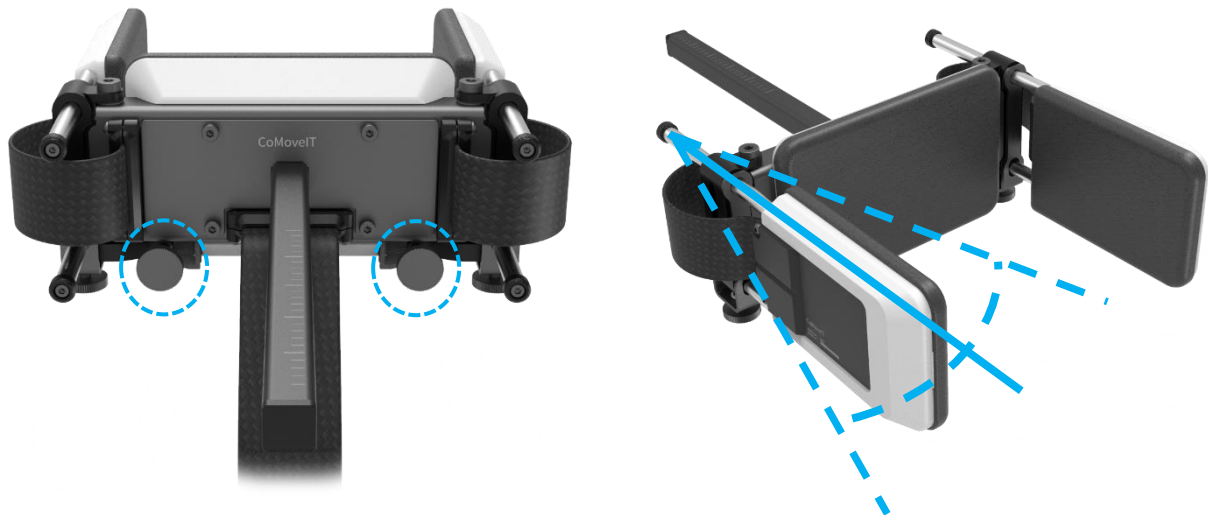


Figure 4. Rotary knobs to adjust the angle of the side head pads.

The depth of the side pads can be adjusted via rotary knobs positioned at the bottom of the head array. The depth of each pad can be adjusted by opening the rotary knob, shifting the pad and tightening the knob. See Figure 5.

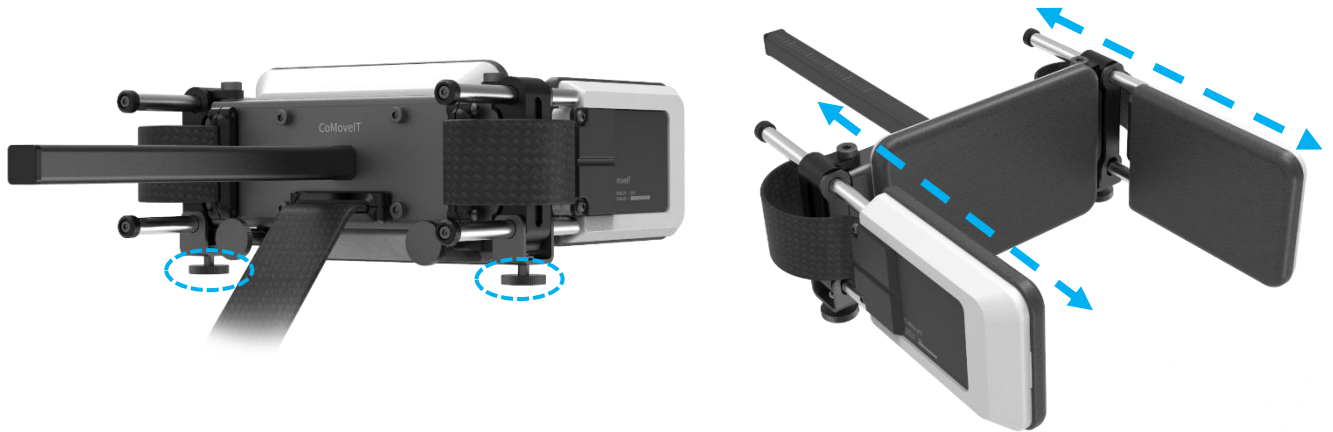


Figure 5. Rotary knobs to adjust the depth of the right and left side pads.



CAUTION!

Forcing any of the adjustment mechanisms to move other than as described above might damage the locking mechanisms.

Head array - right and left head pads

The right and left head pads have a force sensor array integrated in the cushion. See Figure 6.

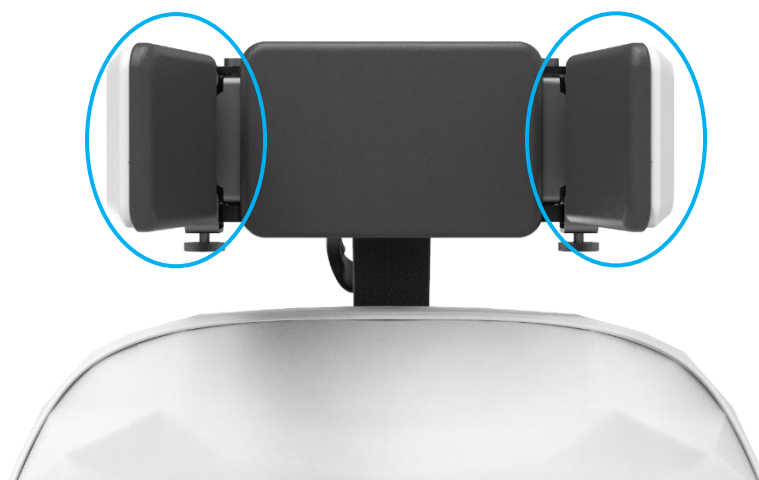


Figure 6. Left-side and right-side head pads where force sensor arrays are integrated.

Head array - back head pad

The back head pad has a force sensor array integrated in the cushion. See Figure 7.



Figure 7. Back pad of the head array where a force sensor array is integrated.



CAUTION!

Depending on the purchased configuration of CoMoveIT Smart, there are either two or three force sensor arrays integrated into the head array. In the configuration of two force sensors arrays, one is integrated on the right-side pad, and one is integrated on the left-side pad. In the configuration of three force sensors arrays, one is integrated on the right-side pad, one is integrated on the left-side pad, and one is integrated on the back pad.



WARNING!

Do not press the head pads using sharp objects. This will affect the operation of the force sensor arrays. This may cause the wheelchair to drive in an unintended manner, creating a dangerous situation. If damage on the head pads is spotted, contact your local authorized distributor.

Foot pads

Each of the foot pads of CoMoveIT Smart holds a force sensor array. The foot pads can be seen in Figure 8.

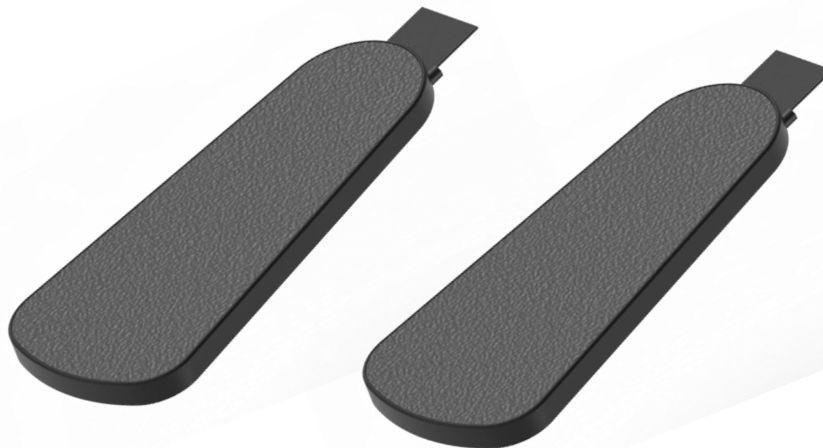


Figure 8. Foot pads of CoMoveIT Smart



WARNING!

Do not press the foot pads using sharp objects. This will affect the operation of the force sensor arrays. This may cause the wheelchair to drive in an unintended manner, creating a dangerous situation. If damage on the foot pads is spotted, contact your local authorized dealer.

Dummy Foot Pad

The dummy foot pad of CoMoveIT Smart does not hold a force sensor array. It is used for symmetry purposes, so both feet of the user are on the same height.

Electronic Control Unit (ECU)

All parts of CoMoveIT Smart are connected to the ECU. The connection scheme can be seen in Figure 9.

Connection Number	Operation
1	9-pin D-Sub connector – communication with the Rnet Omni2 module or the Rnet input/output module.
2	Connect the force sensor array for left turn.
3	Connect the force sensor array for right turn.
4	Connect the force sensor array for user switch.
5	Connect the force sensor array for driving.

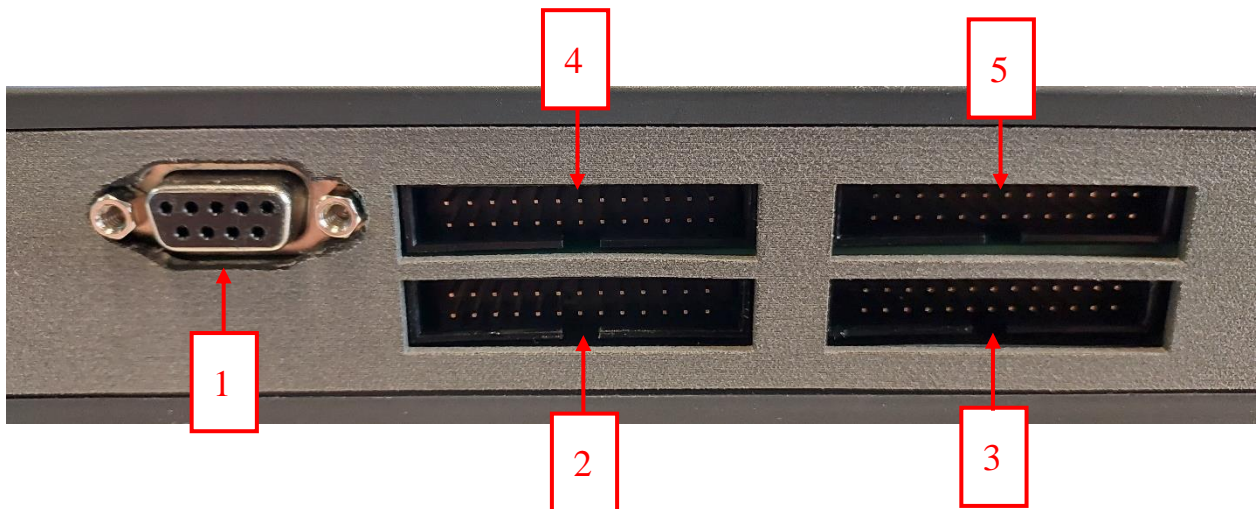



Figure 9. Connection panel.


CAUTION!

Do not tamper with or change the way the connectors are plugged in, as it may cause a dangerous circumstance. Ask for help from a qualified engineer or someone with adequate knowledge to perform the adjustment in an expert manner or contact CoMoveIT if connection changes are required.

CoMoveIT Smart installation

1. Ensure that your wheelchair is switched off.
2. Install the vertical adjuster of CoMoveIT Smart to the holder of the back of the wheelchair seat and tighten the rotary knob. CoMoveIT Smart can fit in any 15 x 15mm square holder. See Figure 10.

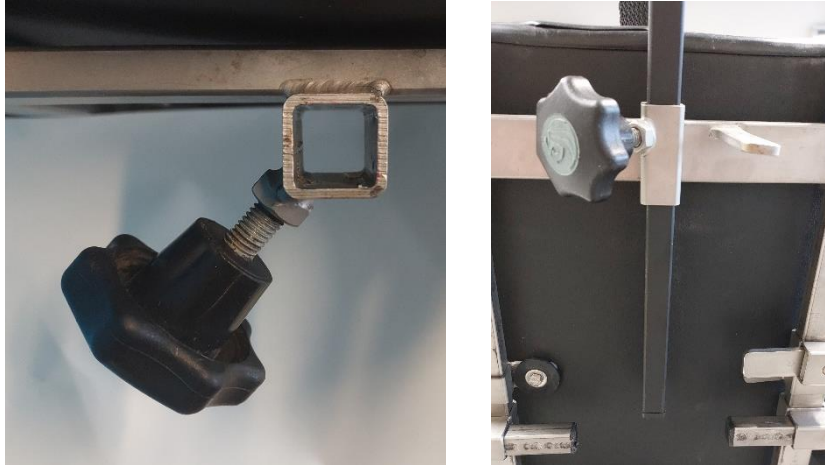


Figure 10. 15 x 15mm square holder.

3. Fixate the cabling of the head array as close as possible the vertical adjuster and to the chassis or frame of the wheelchair or wheelchair seat. The use of tie wraps is highly recommended every 15 to 20 centimeters. See Figure 11.



Figure 11. Use of tie wraps.

4. Keep the cables of the head array away from sharp corners or objects and make sure there is enough tolerance on them when the vertical adjuster is extended.
5. Mount the Electronics Unit on the back of the seat using the four onboard M6 mounting points. It is highly recommended to keep the Electronics Control Unit within the physical limits of the wheelchair.
6. Mount the foot pads of CoMoveIT Smart to the footrest of your wheelchair using the provided Velcro fastener. See Figure 12.



Figure 12. Velcro to attach foot pads to the wheelchair footrest.

7. Fixate the cables of the foot pads as close as possible to the chassis, frame and/or seating of the wheelchair. The use of tie wraps is highly recommended every 15 to 20 centimeters.
8. Keep the cables of the foot pads away from sharp corners or objects and make sure there is enough tolerance on them when the footrest is extended.
9. Connect all sensor cables to CoMoveIT Smart Electronics Unit.
10. Connect and fasten the screws of CoMoveIT Smart DB9 connector to Rnet Omni2 module.

CoMoveIT Smart removal

Perform the installation steps in reverse order.

1. Ensure that the wheelchair is switched off.
2. Remove any tie wraps for the cables of the head array and foot pads.
3. Unscrew and disconnect CoMoveIT Smart DB9 connector from the Rnet Omni2 module.
4. Disconnect all sensor cables to CoMoveIT Smart Electronics Unit by pulling firmly.
5. Remove the foot pads from the Velcro fastener.
6. Remove the head array by unlocking the vertical adjuster mechanism.
7. Remove the Electronics Unit by unscrewing the screws on the four onboard M6 mounting points.



CAUTION!

Installation and removal of CoMoveIT Smart should not be attempted except by individuals familiar and experienced with the process as there may be multiple attaching devices used to secure safely and properly the CoMoveIT Smart and protect the cables.

Operation

General

CoMoveIT Smart is designed for both indoors and outdoors use. For use indoors, normal care should be observed. Outdoors you must remember to move very slowly on steep inclined terrain and be extremely careful when moving over uneven surfaces. Consult the wheelchair's instruction manual for more information on the wheelchair's driving rules. The CoMoveIT Smart electronics translates the pressure applied by the head and feet to move the wheelchair as intended.

Configuration

The CoMoveIT Smart is offered in different configurations depending on the user's ability to use both feet. With each configuration you can drive forward, turn left or right and switch from forward to reverse. You can also enter the controller menu (OMNI2). The way how is different per configuration although turning left or right is always done with the left and right head pad.

Drive with right foot - Switch with left foot

In this configuration, you press the right foot pad to move forward, much like a gas pedal. Obviously turning left or right while driving can be done with the head pads. With your left foot you can activate the switch, which changes forward to reverse. By pressing the left pad, a little longer, you enter the controller menu (Figure 13). When preferred, the left and right foot functions can be swapped.



Figure 13. Drive with foot - Switch with foot configuration.

Drive with back head - Switch with one foot

A configuration for those who feel more comfortable driving forward by pressing the back head cushion is also possible. In this case, there is also a sensor built in at that place. Obviously, it can be used with the left and right pad at the same time in order to allow a smooth ride.

One of the feet, this can be left or right, is then used to control the switch, allowing to change from forward to reverse driving. By pressing the switch pad a little longer, you enter the controller menu (Figure 14).



Figure 14. Drive with back head - Switch with one foot.


Drive with one foot - Switch with back head

A last alternative is to drive forward with one foot, either left or right and use the back head cushion to activate the switch to change from forward to reverse or to enter the controller menu by pressing it a bit longer (Figure 15).



Figure 15. Drive with one foot- Switch with back head.

The force sensor arrays can be used to drive the wheelchair, navigate through the User menu, control the seat functions, control cursors, control external devices via the Omni2 module.

 **WARNING!**

The force sensor arrays integrated into the head and foot pads may inadvertently activate when exposed to rain or excessive moisture or wet hair. This may cause the wheelchair to drive in an unintended manner, creating a dangerous situation.

Auto safety check

The CoMoveIT Smart continuously checks its internal state and the state of the force sensor arrays.

Using your CoMoveIT

Your CoMoveIT Smart has the capability of operating all of the modes and functions of your powered wheelchair. Your healthcare provider and/or an experienced qualified engineer can tailor the operation of your CoMoveIT Smart to your individual needs. This may include changing the functionality and/or the position of the head support and foot support of CoMoveIT Smart. The method that you use to control your powered wheelchair using your CoMoveIT Smart will vary depending on how your provider has programmed the wheelchair Rnet system.

Once the CoMoveIT Smart and the Rnet system are set up to your needs, your local authorized distributor will train you on the operation of your CoMoveIT Smart. If you are unsure how to use your CoMoveIT Smart to control your powered wheelchair, it is advisable to consult your healthcare provider or local authorized distributor.

It is recommended that prior to using your CoMoveIT Smart in public places, crowded places, or in tight driving situations, that you try it out several times in an open space area that is familiar to you, so that you become comfortable with how your CoMoveIT Smart operates. The basic operation of your CoMoveIT Smart is described below.



WARNING!

Do not attempt to operate a powered wheelchair with the CoMoveIT Smart without the assistance and training from a healthcare professional qualified for these activities. Do not attempt to independently operate a powered wheelchair with the CoMoveIT Smart until a qualified healthcare professional gives you the permission to do so.

Straight forward driving

Ensure that your power wheelchair is in drive mode. Apply pressure on the back head pad or the foot pad that is responsible for the forward direction to move straight forward.

- Using the pad of the back head support :
To drive straight forward, press the back of your head to the back pad until the appropriate amount of pressure is applied. Resting your head on the back pad will provide you a support while the wheelchair is driving forward, as well as giving a continuous forward drive movement.
- Using the pad in one of the foot pads:
To drive straight forward, press on the foot pad until the appropriate amount of pressure is applied. Continuous activation of this foot pad will provide a continuous forward drive movement.

Stopping

Release the applied pressure from ALL force sensor arrays to stop the wheelchair's movement.



CAUTION!

An exception is when the wheelchair electronics have been programmed for latched driving. Then, it may be necessary to activate a reset switch to stop the wheelchair's movement. Contact your provider for more details if your wheelchair is setup for latched driving.

Turning right / turning left

Turn right by pressing to the right head pad without activating the forward or reverse pads. This will turn the wheelchair to the right in the smallest possible space.

Turn left by pressing to the left head pad without activating the forward or reverse pads. This will turn the wheelchair to the left in the smallest possible space.

Veer commands

During straight forward driving, it is possible to make a course-correction movement (veer) by pressing the left or right pad at the same time. Veer movements are useful when navigating a path that contains gentle curves. How sharp your electric-powered wheelchair turns during a veer is depending on your wheelchair type and is controlled by the profile and speed chosen.

Changing Operating Mode

The operating mode determines which wheelchair function the CoMoveIT Smart is controlling. The various operating modes can be driving, seat adjustment, mouse control, Bluetooth device control, and infrared device control. Which different modes your wheelchair is able to access is determined by the devices connected to your wheelchair and how Rnet is programmed.

The CoMoveIT Smart can be used to switch between the operating modes by applying pressure long enough on the pad assigned to the switch function to enter the controller menu. Scrolling down is done with the pad responsible for the forward function and selecting or changing a value is done with the right head pad.

Reverse direction command

To activate reverse driving, shortly press on the foot pad assigned to mode switch operation. Then drive reverse by using the forward force sensor array. To switch back to forward driving, shortly press on the foot pad assigned to mode switch operation.

**CAUTION!**

The configuration of the reverse direction command can also be done via the Rnet system by programming additional control modes. Please consult a qualified engineer.

**CAUTION!**

Do not tamper with or change the way the connectors are plugged in, as it may cause a dangerous circumstance. Additionally, various mode switch methods may be programmed in the Rnet system. Ask for help from a qualified engineer or someone with adequate knowledge to perform the adjustment in an expert manner or contact CoMoveIT if connection changes are required.



Maintenance

Cleaning

It is recommended to clean plastic and metal parts of CoMoveIT Smart head array using a damp cloth. In case of excess dirt concentration, a soap water solution can be used. Always wipe dry after cleaning.

The pads of the head array must be cleaned with a damp cloth using water or a soap water solution once a week. During hot weather conditions, it is recommended to clean them every day since sweat concentration might be increased. Gently, wipe dry after cleaning.

The pads of the feet support must be cleaned with a damp cloth using water or a soap water solution. Wipe dry after cleaning. In case excessive wear is spotted on the foot pads of CoMoveIT Smart, please contact your local authorized dealer.

Moisture might potentially affect the operation of force sensor arrays, make sure that all parts and surfaces of CoMoveIT Smart are completely dry before using it to operate the wheelchair.



WARNING!

Never spill water or use a water hose to clean CoMoveIT Smart parts as the sensory system and the electronics may be damaged.

Technical specifications

SPECIFICATIONS	
System Name	CoMoveIT Smart
Interface Connector	Female 9-pin D-sub for the Rnet
Operating Voltage	12V DC
Maximum Current Usage	66 mA
Omni SID Control Type	3-axis Switched Input or 4-axis Switched Input
Force Sensor Array Connector	IDC Connector, 26 Contacts

Symbols



Consult the Instructions for Use before using the device.



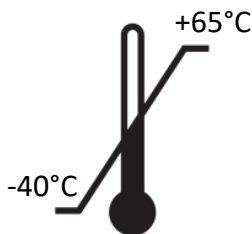
Medical device.



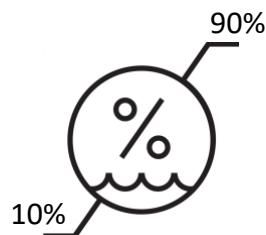
Keep the device away from heat sources, and radioactive sources including ionizing radiation.



Keep the device away from rain.



The device can be safely exposed in temperatures between -40 and 65 °C in storage conditions. Operating temperature range between -25 and 50 °C.



The device can be safely exposed in humidity between 10 and 90%.



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Your local distributor



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Version 1.0, 2022-02-23

Article no.: CM0001-IFU-EN