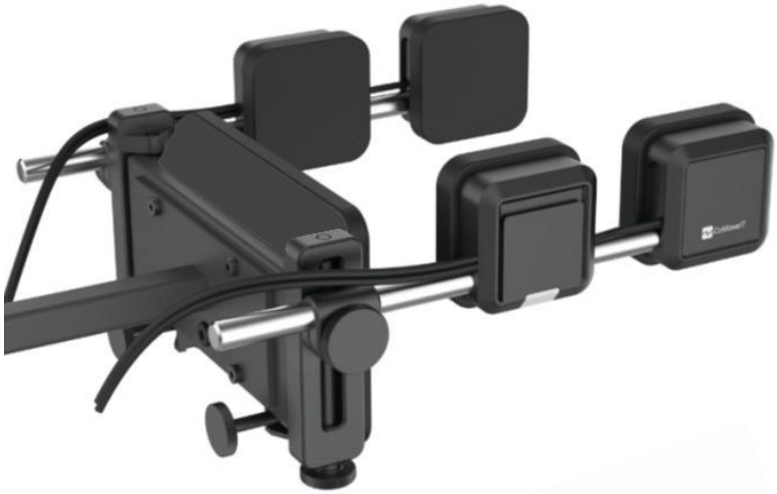
EN

CoMoveIT Flex

Specialty Input Head-Foot Control Device for Powered Wheelchairs



Installation instructions

How to contact CoMoveIT?

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	SKS Rehab AG, Im Wyden 3, CH-8762, Schwanden, Switzerland
UK Responsible Person	UK REP MED Limited, Unit D Crondall Place, Coxbridge Business Park, Alton Road, Farnham, GU10 5EH, United Kingdom

Produced and published by CoMoveIT, Belgium

Version 1.0, 2026-04-15

Article no.: CM0020-INST-EN

Table of Contents

Important information about these Installation Instructions

Before installing this product, it is important to read these Installation Instructions and in particular the Safety Instructions. They also contain important safety and maintenance information, as well as describe how to use the product in the best way.

Make sure to store these Installation Instructions for future reference.

All information, pictures, illustrations, and specifications are based upon the product information that was available at the time that these Installation Instructions were printed. Pictures and illustrations that are found in these Installation Instructions are representative examples and are not intended to be exact depictions of the various parts of the product. CoMoveIT reserves the right to make changes to the product without prior notice.

You can find the latest version of this document on www.comoveit.com.

Serious incidents

SERIOUS INCIDENTS
In case of adverse or serious incidents causing human injury, this should be reported as soon as possible to CoMoveIT (vigilance@comoveit.com) or your local distributor, and to the competent authority of the Member State in which the user is established.

Support, scrapping and spare parts

Technical support

In the event of technical problems, contact CoMoveIT at +32 477 88 01 75 or via info@comoveit.com.

Always state the Reference and Serial Number of the product to ensure that the correct information is provided.

Warranty

CoMoveIT warrants CoMoveIT Flex 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 dealer. Normal wear and tear and consumables are always excluded from the warranty.

Commencement of Warranty Period

The warranty of CoMoveIT Flex 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. CoMoveIT 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.

Amendments

No person is authorized to change, extend, or waive the warranties of CoMoveIT. Warranty shall only 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 Flex product.

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

Safety Rules

General

Read the Installation Instructions carefully, paying particular attention to the safety instructions and the warning texts.

Follow the instructions in order to prevent the risk of accidents from use.

All alterations to and interventions of the product must be performed by a qualified service engineer. In case of doubt, always contact CoMoveIT.

All information and specifications included applied at the time of delivery of this product. CoMoveIT reserves the right to make changes without prior notification.

Warning labels

The Instructions for Use and these Installation Instructions 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. A situation could result in minor or moderate injury.

⚠ WARNING!

Please use extreme caution where this warning symbol appears. Failure to observe warnings can lead to serious injury or death.

General Warnings and Cautions

⚠ WARNING!

Do not attempt to operate a powered wheelchair with the CoMoveIT Flex without the assistance, training and permission from a qualified healthcare professional.

⚠ WARNING!

The wheelchair must be fitted with an emergency stop function that is within the reach of the attendant. Users who are unable to operate an emergency stop button should have an accompanying person with them at all times.

⚠ WARNING!

Stop using the device immediately if it is behaving abnormally or erratically.

⚠ WARNING!

The device may inadvertently activate when exposed to rain , causing the wheelchair to drive in an unintended manner, creating a dangerous situation.

⚠ WARNING!

Electromagnetic Compatibility (EMC)
This product complies with the limit values for Electromagnetic Compatibility (EMC) with respect to powered wheelchairs, as set out in ISO 7176-21.
This device can disturb the operation of devices in its environment that emit electromagnetic fields (e.g. alarm systems, automatic doors, etc.).
The driving performance of this device can be influenced by electromagnetic fields (e.g. those emitted by electricity generators or high-power sources).

⚠ WARNING!

Do not bump against other objects, do not compress or squeeze any parts of your device.

⚠ WARNING!

Do not use the footpads if the top layer is damaged or worn out. This may cause inadvertently activation, causing the wheelchair to drive in an unintended manner, creating a dangerous situation. Visible and palpable damage indicates the need for replacement. Replacement can be done by qualified personnel.

⚠ WARNING!

In case of critical fault, the device may come to a sudden stop at any time during operation.

⚠ 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

Do not press the head pads and footpads of your device using sharp objects. This will affect the operation.

⚠ CAUTION

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

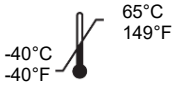
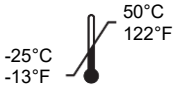
⚠ CAUTION

The head array of CoMoveIT Flex 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 170 newtons.

List of Symbols

All symbols used in the labeling of CoMoveIT Flex are in accordance with ISO 15223-1:2021 Medical devices

Symbol	Description	Symbol	Description
	Consult instructions for use or consult electronic instructions for use		Protect from rain
MD	Medical device		Protect from heat and radioactive sources
	Manufacturer		Handle careful to avoid damage
 YYYY-MM-DD	Country and date of manufacture		Don't used if the package is damaged or opened and consult instructions for use.
REF	Product reference number	CH REP	Authorized representative e.g. for Switzerland
LOT	Batch number		Local distributor
SN	Serial number		Don't discard as unsorted waste, send to separate

Symbol	Description	Symbol	Description
			collection facilities for recovery and recycling
	Storage temperature range	CE	Conformity with European health, safety, and environmental protection standards.
	Operating temperature range	**IP41**	Protection against solid foreign objects ≥ 1 mm and against vertically falling water drops (IEC 60529).
UDI	Unique device identifier		
UDI (01) (11) (21)	(01) Global Trade Item Number (10) Batch number: 6-digits: YYMM and 2-digit number (11) Date of Manufacture: 6-digit indicating year, month and date in the following format: YYMMDD. (21) Serial Number: 9-digit number		

Intended Use

CoMoveIT FLEX is intended to be used as a specialty input control device for powered wheelchairs. CoMoveIT FLEX allows users to control their powered wheelchair with their head or head and feet.

CoMoveIT FLEX captures pressure applied by the user on the head array and foot pads of the device and translates them into driving commands for the powered wheelchairs.

Moreover, CoMoveIT FLEX adapts in real time the required by the user pressure in order to activate the wheelchair control command. CoMoveIT FLEX offer multiple degrees of freedom for the adjustment of the head array. CoMoveIT FLEX is configurable via the user interface of the electronics control unit.

Intended User Group

CoMoveIT FLEX is intended to be used in adult and pediatric power wheelchairs for people who lack the ability to control the powered wheelchair via conventional means such as joysticks, chin controls and conventional head controls.

CoMoveIT FLEX is intended to be used by people diagnosed with Dyskinetic Cerebral Palsy (DCP), Multiple Sclerosis (MS), Amyotrophic Lateral Sclerosis (ALS), Tetraplegia, Spinal Cord Injuries (SCI) and other complex movement disorders.

Contraindications

CoMoveIT Flex must not be used by individuals who have a severe mental disability, and are not able to follow and understand basic instructions, are diagnosed with severe visual impairment, or suffer from severe epilepsy. The user must be able to estimate and correct the results of actions when operating the wheelchair.

Environmental Conditions

Operation

- Operating temperature range: -25°C to 50°C // -13°F to 122°F
- Relative humidity: 10% and 90%.

⚠	**WARNING!**
Do not use the device under rain. To assure the water ingress level of the electronic control unit, always leave the connection protection in place.	

Storage

- Recommended storage temperature range: room temperature
- Maximum temperature range: -40°C to 65°C // -40°F to 149°F
- Keep dry
- Keep away from sunlight and sharp objects.

Always conduct a functional check before using your device after a long-term storage.

Device Description

General

CoMoveIT Flex consists of a head array with five sensor pads and an electronic control unit (ECU), optionally combined with one or two footpads, each equipped with a forefoot and heel sensor. The sensors detect user-applied pressure and translate it into driving and other control commands for a powered wheelchair.

Identification of parts

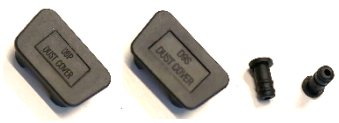
Item picture	**UDI (part number / GTIN), Product name, description**
	**UDI: 05430002911106** **CoMoveIT Flex**: • Head set with 5 head pads with pressure sensors • Electronic Control Unit (ECU) • DB9 cable for connection with wheelchair controller • Vertical adjuster for head set mounting

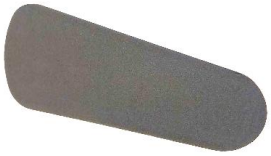
	**UDI: 05430002911113** **CoMoveIT Flex F**: Footpad with pressure sensor under front and heel of the foot. (to be purchase separately from CoMoveIT Flex)
	**UDI: 05430002911045** **CoMoveIT Smart dF**: Dummy footpad, without sensor or cable. (to be purchase separately from CoMoveIT Flex)
	**UDI: 05430002911137** **CoMoveIT Flex dF**: Dummy footpad, without sensor or cable. (to be purchase separately from CoMoveIT Flex)
	**UDI:** 05430002911069 **Headset Mounting Clamp:** Mounting clamp for fixation and height adjustment – Fit for a.o. Permobil power chairs. (to be purchase separately from CoMoveIT Flex)
	**UDI:** 05430002911090 **Headset Mounting Clamp S:** Mounting clamp for fixation and height adjustment – Fit for a.o. Sunrise Medical power chairs. (to be purchase separately from CoMoveIT Flex)

Note: Only specified products shall be used with the device.

Spare parts and consumables

Spare Parts	
Item Picture	Part number and description
	Part number: COM 1100 1x FLEX Electronic control unit (complete), incl factory loaded software
	Part number: COM 2200 1x FLEX Head Array (without head array mounting set)
	Part number: **05430002911113** 1x FLEX Footpad

	Part number: **05430002911045** 1x Smart dF
	Part number: **05430002911137** 1x Flex dF
	Part number: A006619s 1x frontal Side pad (excluding cable and protective rubber) Note: Common part for left and right
	Part number: A006617s 1x Side pad with lever (excluding cable) Note: Common part for left and right
	Part number: A006615s 1x Head back pad including the sensor, without the metal frame
	Part number: S-CMF1-01 1x Head Array cable set (including braided sleeve)
	Part number: S-CMF1-02 1x Footpad cable set (including braided sleeve)
Consumables	
	Part number: P033203s 1x DB9 cable male to female
	Part number: 2x Dust cap DB9 male 1x Dust cap DB9 female 10x Dust cover 3.5mm stereo jack female
	Part number: COM00096 1x Velcro (soft & hard)

	Part number: COM00097 1x EVA cover pad
	Part number: C-CMF1-01 2x Rotary knobs Back
	Part number: COM00065 1x Side pad silicone rubber cushion
	Part number: COM00066 1x Circumferential cushion Right Pad 1x Circumferential cushion Left Pad
	Part number: C-P032260 2x End stoppers 10mm
	Part number: COM0034 1x Back head cushion
	Part number: COM0081 1x Footpad Cable 2m, straight 3,5mm jack to straight 3,5 mm jack
	Part number: COM00082 1x Head array Cable 1,5m, angled 3,5mm jack to angled 3,5 mm jack
	Part number: COM0098 1x ECU Membrane buttons
	Part number: COM0008 1x Rotary knob of the vertical adjuster (Locking knob)
	Part number: AA62718 1x Lever for the horizontal adjuster (Lever M6x16)

Features

Head control or head-foot control with up to 9 sensors: The system can be configured based on the abilities of the user. The head array holds 5 sensors and each footpad holds

2 sensors. The function of each sensor is assigned by plugging its cable in one of the 10 potential inputs on the ECU.

Sensor positioning: The position of sensors on the head array can be adjusted in a high number of ways to optimize operation and comfort of the user.

Driving and non-driving functions: besides driving commands forward, reverse, left and right, the user can select “User Switch” to open the controller menu (e.g. to adjust seating position). Also “Out select” to change from driving mode to output port control or “Relax” to change from driving mode to sleeping mode can be selected.

Electronic Control Unit (ECU): this central control unit has 10 input for the sensors, 2 output ports for external devices and the output to the wheelchair controller. The ECU includes:

- **A User Interface** providing access to mode selection, sensitivity adjustment and system settings. .
- **Sensitivity adjustment** for each sensor. The sensitivity range can be set individually, defining the minimum required and maximum permitted force to activate the assigned function.
- **Adaptive algorithm**: an advanced real-time and continuous adaptation, taking short and longer term driving patterns into account, results in limitation of pathological high tone.
- **Selectable switched or proportional control**: Switched operates at a defined speed. Proportional control transfers increasing pressure into increasing driving speed.
- **Two output ports** to connect external devices like communication tools, home automation and gaming controllers. The driver can switch from driving to output control and back. An attendant can also activate the other output port on the ECU menu.

Installation

⚠	CAUTION
The Installation of CoMoveIT Flex has to be done by qualified personnel and according to the Installation manual which can be downloaded from www.comoveit.com	

⚠	CAUTION
Installation should only be done by individuals familiar with the process as there may be multiple mounting and fastening tools used to secure the product.	

⚠	CAUTION
Don’t use the product or the wheelchair in case the installation has not been completed or in case of problems after installation.	

⚠	CAUTION
All elements of the system should be fitted in a stable and proper way, avoiding damage of any part, cables or sensors. The head arrays needs to be solid for use, footpads need to be attached with Velcro on the footplate and stable. Contact your local distributor in case of doubt.	

Compatibility

CoMoveIT Flex works with PG Drives Technology R-net OMNI2 (including related like Permobil Power Platform), Q-Logic 3 EX Enhanced Display, Curtis Instruments AG Display Module and Dynamic Controls Linx IN 500.

If only 3 driving commands forward, left and right are used, the wheelchair controller shall be configured in 3-axis proportional driving. If also reverse is used as separate command, the wheelchair controller shall be configured in proportional driving.

⚠ CAUTION
The powered wheelchair must always be programmed for proportional driving. Selection between proportional and switched driving is selected via the user interface of FLEX.

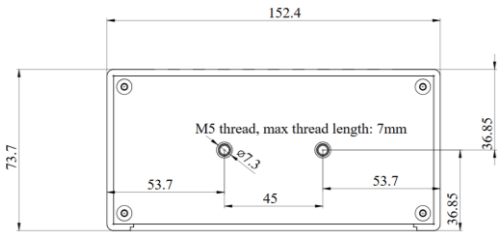
⚠ CAUTION
Programming of compatible wheelchair control systems should only be done by qualified personnel and in accordance with the specifications, requirements and safety rules defined in the installation manuals of the control system.

⚠ CAUTION
Installation should only be done on a wheelchair of which the manufacturer allows the installation of third party devices.

Mechanical installation

⚠ CAUTION
During installation on the wheelchair, ensure the wheelchair is turned off.

	Attach a 16x16mm square holder, e.g. CoMoveIT's Headset Mounting Clamp, at the back of the wheelchair. The mounting clamp must be purchased separately.
	Mount the foot pads to the footrest of your wheelchair using the provided Velcro fastener.

	Fixate the cabling along the vertical adjuster and along the wheelchair frame. Keep them away from sharp edges. Ensure enough tolerance for extension of the vertical adjuster and footrest. The use of tie wraps is recommended every 15 to 20 centimeters
	In case the footpad cable collides with the wheelchair footplate in such way the cable could be damaged, reinstall the cable to a different output guide on the bottom side. To do this, open the bottom plate of the footpad. Mount back after modification.
 Dimensions: 	Mount the ECU at the back of the wheelchair, within the physical limits of the chair and preferably where the user interface is visible. Use 2x M5 bolts, thread length: 7mm maximum length CoMoveIT does not offer a specific mounting bracket for the ECU.

⚠ WARNING!

Keep all cables of CoMoveIT FLEX away from electrically powered mechanisms that can act as pinch points.

Software Installation

Unless there is a software upgrade of the ECU available on www.comoveit.com, there is no software installation required.
The programming of the wheelchair controller is described further.

Operation and Set up for Use

⚠ WARNING!

Do not use the device under rain.

⚠ WARNING!

Do not attempt to operate a powered wheelchair with the CoMoveIT Flex without the assistance, training and permission from a qualified healthcare professional.

⚠ WARNING!
The wheelchair must be fitted with an emergency stop function that is within the reach of the attendant.

⚠ WARNING!
The attendant or healthcare professional is expected to interpret the abilities of the user in terms of speed, any of the functionalities, cognitive and mental ability to use a powered wheelchair, in particular the safety mechanisms such as on/off button or an emergency button.

⚠ WARNING!
CoMoveIT FLEX is not appropriate to use during car transportation of the powered wheelchair.

⚠ WARNING!
Do not cover the head array and foot pad.

⚠ CAUTION
CoMoveIT Flex 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.

⚠ CAUTION
Do not use sharp objects on the display or the surface of the ECU to avoid damage.

Using the CoMoveIT

Before using CoMoveIT FLEX for the first time, it is advised that the provider assists and explains the different possibilities and options to the user and/or the attendant. If you are unsure how to use your CoMoveIT FLEX to control your powered wheelchair, it is advisable to consult CoMoveIT.
It is important that the user and the attendant are fully aware of how to use the system and the possible adjustments to optimize the use experience.
It is recommended, prior to using a CoMoveIT FLEX in public places, crowded places, or in tight driving situations, that the users try it out several times in an open space area that is familiar to them, so that they become comfortable with how your CoMoveIT FLEX operates.
Please inspect the device following the Maintenance section.

⚠ WARNING!
Turn off the wheelchair prior to entering or exiting the wheelchair.

Basic functionality for the driver:

Some of the below mentioned functions might not be possible for all wheelchair users. The feasible configuration is determined together with qualified personnel.
A sensor connected to input X on the ECU is referred to as *input X* sensor (e.g. *Relax* sensor).

Driving the wheelchair	• Apply pressure on the sensors on the head array and potentially in the footpads, which have been given driving functions, to drive forward and backward and to turn the wheelchair left and right. Combine forward/reverse with turning to veer. • Release any pressure from these sensors to stop wheelchair movement. • Operational forces can range between 50 gr and 15kg, depending on the sensitivity settings on the ECU. ⚠ **CAUTION** When the wheelchair is programmed for latched driving, it may be necessary to activate a reset switch.
Speed control	• When the driving type is “Proportional”: press harder to drive faster • When the driving type is “Switched”, the wheelchair drives at a predefined speed.
Controlling external devices:	• Select External mode by pressing the *Out Select* sensor. This will allow you to use the different sensors to control functions of the external device.
Putting the wheelchair to sleep mode	• Press the *Relax* sensor. All sensors except this one will not respond until you exit the relax mode by pressing the *Relax* sensor
Use wheelchair operating modes like Seating adjustment	• Press the *User Switch* sensor to access the wheelchair controller modes. Navigate to e.g. seating with the *Forward* sensor and select with the *Right* sensor • Functions are typically Seating, Bluetooth device control, and infrared device control.

Advanced functionality, configuration and set up

Qualified personnel can tailor the operation to the individual needs, according to the following sections:

Defining the configuration	➔ See ‘ECU connections determining the configuration’ (below)
Optimizing the position of the head support	➔ See ‘Head array adjustments’ (below)
Using the Electronic Control Unit: Set up and use.	➔ See ‘ECU User Interface’ (below)
Change the Operating Mode	➔ See ‘Operating Modes’ (below)
Adjust the sensor sensitivity	➔ See ‘Sensitivity settings’ (below)
Adjust system settings	➔ See ‘System settings’ (below)
Defining the wheelchair modes and parameters by programming the wheelchair controller.	➔ See Installation Manual and Instruction for Use of the wheelchair

ECU Connections determining the configuration

⚠	CAUTION
Handle the connectors and cables of the device elements with care.	

Inputs (top)

Connect the sensor cables with their jacks to the ECU input according to the desired configuration: the sensor gets the function as indicated on the ECU (see below).

E.g. connect the back head sensor to Rev 1 to drive backwards when applying a certain pressure on the back head sensor.

⚠	CAUTION
	Message codes might appear when (un)plugging jacks. Press OK to clear the message. If it returns, contact your qualified distributor. The sensor or cable might be damaged.

⚠	CAUTION
Do not insert jack plugs from any other devices like buddy buttons (won't work), head phones,… to avoid damage.	

⚠	CAUTION
Do not insert jacks plugs of the head array and footpad to other devices (laptops, phones,…. to avoid damage)	

⚠	CAUTION
Use only jack cables provide by CoMoveIT. Third-party cables might affect the functionality of your device.	

⚠	CAUTION
Remove the protective cover, before connecting a jack. If the sensor connections are not used, always place or keep the protective covers in.	

→	Forw 1	Connect the sensor for driving forward
→	Forw 2	Connect the sensor for driving forward (identical as Forw 1)
→	Left1	Connect the sensor for left turn
→	Left 2	Connect the sensor for left turn (identical as Left 1)
→	Right 1	Connect the sensor for right turn
→	Right 2	Connect the sensor for right turn (identical as Right 1)
→	Rev 1	Connect the sensor for reverse driving
→	User switch	Connect the sensor for user switch

→	Out select	Connect the sensor for change from driving to output channel
→	Relax mode	Connect the sensor to go in relax mode

Practical example of input configuration with a headset and one footpad:

- Forw 1: connect the sensor of the front of the right footpad
- Forw 2 - not used
- Left 1: connect the left side pad most to the back
- Left 2 - not used
- Right 1: connect the right side pad most to the back
- Right 2 - not used
- Rev: connect the back head sensor
- User Switch: connect right side pad most to the front
- Out select - not used
- Relax: connect left side pad most to the front

In this example,

- the user will be able to drive forward by pressing on the right foot pad with the front of this foot. The sensor in the heel of the footpad is not used.
- The user will be able to turn left by pressing the rearmost left side pad and to turn right by pressing the rearmost right side pad.
- The user will be able to put the wheelchair in and out of the relax/sleeping mode by pressing the most front left side pad once.
- The user will be able to go in and out the user menu by pressing the most front right side pad once.
- The user will be able to drive backwards by pressing on the back head pad.
- The inputs FORW2, LEFT2 and RIGHT2 are not connected in this case. If they would be, the connected sensor will also act as respectively forward driving, turning left and turning right, just as if it was connected to the same numbered 1. The purpose of these second inputs is to allow the user to use two locations as input sensor, e.g. connecting the front and the heel of the footpad to FORW1 and FORW2 will allow him to drive forward when pushing on the front or on the heel or on both at the same time.

Outputs (bottom):

Connect the DB9 output with the wheelchair controller with the provided DB9-DB9 cable.

Connect a DB9 output OUT1 or OUT2 to an external device (e.g. gaming controller, home automation controller) to control it with the CoMoveIT Flex. Additional cables e.g. DB9 to jacks needs to be purchased separately for this. *The external device will need to be set up for correct operation of the controls.*

⚠	**CAUTION**
Don't connect the output to non-compliant devices.	

To control

Connect the wheelchair controller with the provided DB9 cable. Make sure to fix the screw of the DB9 connector to avoid error messages.

⚠	**CAUTION**
Use only the DB9 cable provided by CoMoveIT. Third-party cables might affect the functionality of your device.	

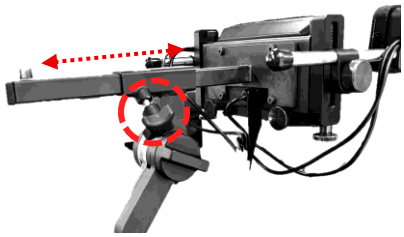
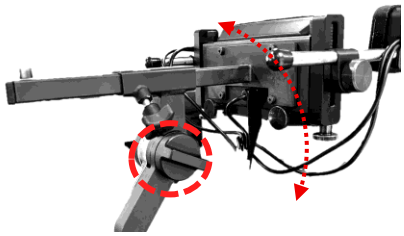
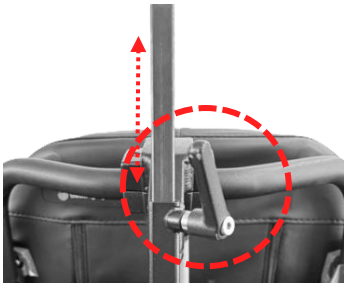
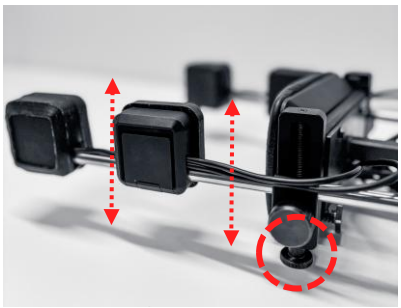
⚠	**CAUTION**

		Remove the protective cover, before connecting a DB9 cable. If the output connections are not used, always place or keep the protective covers in.
	Out 1	Connect to an external device
	Out 2	Connect to an external device

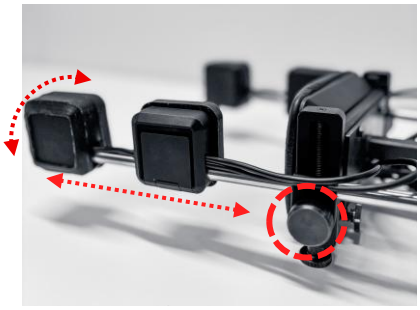
Practical example of setting up OUT1 and OUT2:

A wireless unit of a home automation control system is connected to OUT 1, allowing the wheelchair driver to control window blinds independently. For this, the user switches from driving to this system, by pressing the *Out Select* sensor. To return to driving mode, he presses the same sensor again.
When the wheelchair user wants to play a computer game, an attendant connects the a game controller to OUT 2 and has to select “OUT 2 ACTIVE” in the menu. To go back, the attendant disconnects any wires, selects OUT1 ACTIVE as default output. Remark that leaving OUT2 ACTIVE would allow the user only to switch between driving and OUT 2, not reaching OUT 1.

Head array adjustments

	Use the rotary knob or lever to move the head array more to the front or to the back
	Use the rotary knob to change inclination ⚠ **CAUTION** Do not overtighten the rotary knob to avoid damage.
	Use the lever to change the height of the head array.
	Use the rotary knobs at bottom side to change the height of the side pads.

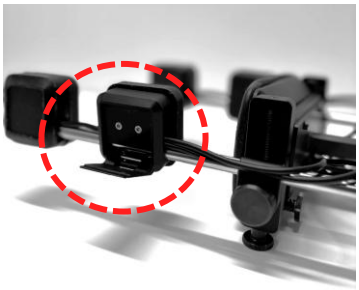
Use the rotary knobs at the back to change the opening angle of the side pad bar.

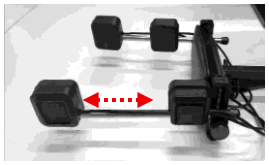


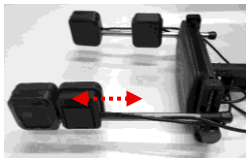
Us the rotary knob at the side to rotate the bar around its axis or to slide it more to the front or to the back.

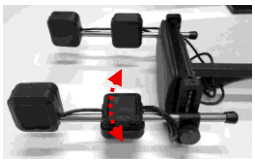
⚠ CAUTION

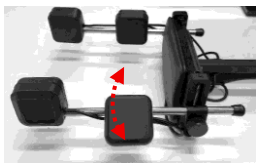
Do not try to rotate the bar when the rotary knob is tightened. This might damage your device.











Open the lever to rotate the rearmost side pad or to slide it along the lateral bar.

⚠ CAUTION

Do not force any adjustment of the rearmost side pad when the lever is locked. This might damage your device.

⚠ CAUTION

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

⚠ CAUTION

Ensure that all adjustment mechanisms are locked before use.

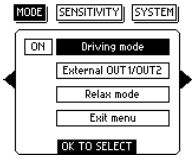
ECU User Interface

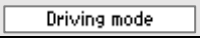
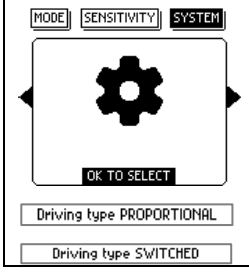
After power up the User Interface will start in a “**status**” screen.

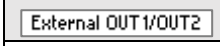
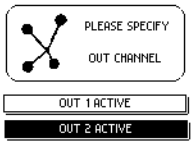
Menu

	Status → OK → Menu • **Mode:** select the active operating mode. The currently active mode is indicated. Mode changes take effect immediately after confirmation. • **Sensitivity**: to adjust sensor activation levels within defined limits. User-level settings are stored when confirmed. • **System**: to configure device settings, including driving type selection, audio feedback, Out Select activation time, password protection, and system information. Access to advanced (master) settings requires appropriate authorization.

Modes

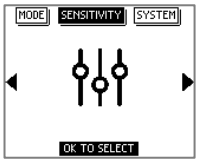
	Status → OK → Menu → MODE “ON” = active. OK to exit → Status Possible operating modes are Driving, External and Relax.

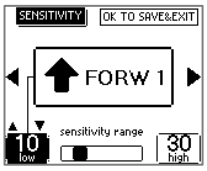
Driving Mode 	Status → OK → Menu → MODE → Driving mode
How does it work?	• Sensor pressure is converted to driving commands and control of the wheelchair user switch. • Pressing the sensor connected to any forward (left/right) input will lead to forward driving (left turning/right turning) of the wheelchair. • Pressing the sensor connected to reverse input will lead to reverse driving. • Combined movements are possible. • For directions with two channels (e.g. Forward 1 and Forward 2), the system selects the higher of the two values as command. • For opposing directions (e.g. Forward and Reverse), the resulting output is based on the difference between the two inputs. • Depending on the selection of the driving mode, the speed will remain the same or the speed will change in accordance with the applied pressure. • Stop pressing to stop the active command.
How to change the driving type? 	Status → OK → Menu → SYSTEM → OK The indicated driving type is active. Press < > to toggle the driving type: • **Proportional** control transfers increasing pressure to increasing driving speed. • **Switched** control operates at a defined, fixed driving speed.

External Mode: 	Status → OK → Menu → MODE → External OUT1/OUT2 *or* Press *Out Select* sensor for a configurable duration (short activations do not switch the operating mode).
How does it work? 	• The status screen will show the active output • All sensor inputs (except *Out Select* and *Relax*) are used exclusively to activate external device controls. Any wheelchair movement is disabled. • *The external device needs to be set up for correct operation of the controls.*
How to change which output is active? 	Status → OK → Menu → MODE → External OUT1/OUT2 → Select OUT X ACTIVE → OK • The selected output will be active and is also the one that the driver is able to select with the *Out Select* sensor. ⚠ **CAUTION** When OUT CONTROL is active, the wheelchair interface keeps displaying the Drive Profile or Mode, but your Flex does not control the wheelchair.

Relax Mode	Status → OK → Menu → MODE → Relax mode *or* Press the *Relax* sensor to bring the wheelchair to sleeping mode.
How does it work? 	• The status screen will show the relax mode status. • The wheelchair is brought into its sleep state. All sensor inputs are ignored (except the *Relax* sensor itself). • While going into Relax mode and depending on the programming of the wheelchair controller, the wheelchair user switch menu might be temporarily active before entering the sleep state. • If audio feedback is enabled, sensor activation results in an audible indication confirming that the input is blocked.

Sensitivity settings

	Status → OK → Menu → SENSITIVITY The sensitivity of each individual sensor can be set in the ECU menu.
How does it work?	• Applying a sensor pressure between the set low and high value will lead to activation of the function of that input. • In proportional driving type, the force applied just above “low” will lead to lowest speed, while a force applied just below “high” will lead to the highest speed. • Excessive pressure, for instance by hyperextension, on forward or reverse driving will stop the wheelchair.
How to set up?	Status → OK → Menu → SENSITIVITY → OK • Enter user password if requested: Press 5x > + OK • Press < > to select the sensor input (e.g. FORW 1).


 
	• "low" shows the threshold from where the function will be activated;
	• "high" shows the threshold below which the function will be activated.
	• The values can be 1-99,
	  ○ 1 indicating the lowest possible activation force (highest sensitivity),
	  ○ 99 indicating the highest possible activation force.
	  ○ Only force applied between the low and high value, will activate the function.
	• One or multiple inputs can be set, OK to save and exit → SENSITIVITY
	
	Note: Leaving any screen untouched for 1 minute will result in loss of changes in the settings.

Determining the value	• Set the low value to a level that allows comfortable activation but avoids unintended activation by rest position for instance. Practically, increase the low value until you find the rest point for that sensor position. If the activation seems to be reached too easily, the low value needs to be increased for that sensor input. • When in proportional control: Set the high value to define the highest force level that a user has to apply to achieve the full proportional speed range. Practically, bring the high value down step by step, still allowing the user to drive the highest speed in a comfortable way. • Set the high value to define a safety level at excessive pressure: any pressure to a certain extent higher than the set high value on the forward and reverse driving function will stop of the wheelchair movement. • In case the applied force doesn't activate the wheelchair, decrease the low value unit the lowest force is found, increase the highest value so the overpressure safety stop is not activated all the time. Master settings of the sensitivity can be restored at all times via the SYSTEM tab (see further).

Practical example

- Forw 1: connect the sensor of the front of the right footpad, sensitivity low = 15
- Forw 2 - not used
- Left 1: connect the left side pad most to the back, sensitivity low = 5
- Left 2 - not used
- Right 1: connect the right side pad most to the back, sensitivity low = 5
- Right 2 - not used
- Rev: connect the back head sensor, sensitivity low = 50
- User Switch: connect right side pad most to the front, sensitivity low = 25
- Out select - not used
- Relax: connect left side pad most to the front, sensitivity low = 25

In this example,

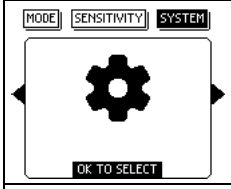
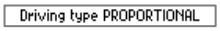
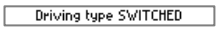
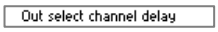
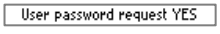
- The rest point of the right foot is just below 15, the rest point of the back of the head is just below 50. In order not to activate the user switch and the relax mode by a too soft touch, the low value is set to 25.
- These values are indicative only and need to be determined per user.

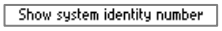
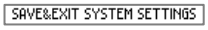
Note:

CoMoveIT Flex executes an advanced real-time and continuous adaptation, taking short and longer term driving patterns into account. This has impact on the actual threshold that are active after a certain period of use. The actual range limits might be brought lower or higher as a result of the algorithm taking the user's movement pattern into account. This feature is key to limit pathological high tone and to resolve challenges in case of evolution of the movements or forces executed by the user.

All adapted values are reset to the set values in the SENSITIVITY menu, each time there is any value changed in that menu.

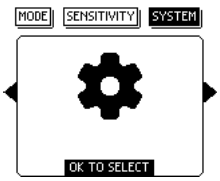
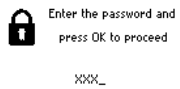
System settings

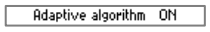
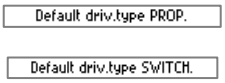
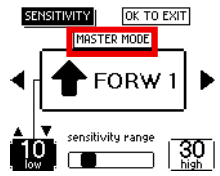
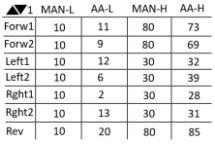
	Status → OK → Menu → SYSTEM
	OK → Enter user password if requested: Press 5 times > + OK
Driving type  	The indicated driving type is active. Press < > to toggle the driving type → OK to save and exit • **Proportional** control transfers increasing pressure to increasing driving speed. • **Switched** control operates at a defined, fixed driving speed.
Audio signals  	Press < > to toggle between ON and OFF → OK to save and exit The volume cannot be adjusted. Audible feedback does not affect device functionality. Distinct audible signals are used to indicate system conditions: - Message code: triple beep - Sensor press in Relax: single beep
Out select channel delay 	Indicates how long the user needs to press the out select to toggle between driving mode and external mode. Press < or > to change the duration between 1,0 and 9,9 seconds → OK to save and exit
User password request  	The device supports a user password and a master password, entered using predefined button sequences. Press < or > to toggle ON and OFF → OK to save and exit When ON, the password is required for SENSITIVITY and SYSTEM access. Master settings will always require the master password. Passwords cannot be changed. • **User password:** Press 5x > + OK • **Master password: contact CoMoveIT to get the password**
Purpose of the user password request	• When the user expects people to enter the ECU menu and potentially change values without knowledge or unintentionally.

	• It is recommended to activate the user password when not in a configuration or set up activity.
Show system identity number 	This section displays the identity of the device, including the device serial number in the last 8 characters and the software version.
Master settings 	OK → enter password There are two functions under this title. 1) When entering the user password, it allows to restore the master settings. We recommend to restore the master settings when the settings at delivery were changed to a status where you lost the reference point. OK → Enter user password → OK → RESTORE → OK → RESTORE → OK **2)** Entering the master password allows access to the Master mode, which are meant to be set by CoMoveIT or CoMoveIT's authorized distributor at installation of the device. **See next section for set up of the Master mode.**
Save and Exit 	OK to save and exit system settings.

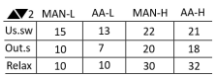
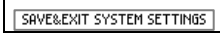
Master settings

⚠ CAUTION
Changes in Master settings should only be done by qualified personnel. If you doubt about any of the settings, do not change and contact CoMoveIT.

	Status → OK → Menu → SYSTEM
	OK → Enter MASTER password if requested If not requested: go to SYSTEM 2/2 → Master settings → OK → Enter MASTER password
	All changes made to Master settings require to be saved explicitly. SAVE MASTER SETTINGS > OK > confirmation shown.

	**Note: Leaving any screen untouched for 1 minute will result in loss of changes in the master settings.**
Adaptive algorithm 	This function can be used to simulate the product CoMoveIT Drive with the CoMoveIT Flex. Please refer to the specific documentation of CoMoveIT Drive for more information. **For CoMoveIT Flex in standard status, it needs to be ON** To go to standard CoMoveIT Flex setting: Adaptive algorithm ON > SAVE MASTER SETTINGS > OK
	To emulate CoMoveIT Drive: Adaptive algorithm ON > SAVE MASTER SETTINGS > OK When switched to OFF, the adaptive algorithm that has its influence on the specific results related to limitation of pathological tone is switched off. The Status screen will indicate that you are in the CoMoveIT Drive emulation mode. Be aware that footpads cannot be used with CoMoveIT Drive! Only 5 head pads exist, so only up to 5 inputs can be used to make a realistic CoMoveIT Drive emulation.
Default driv.type 	Set the default driving type: Press < > to toggle the driving type → SAVE MASTER SETTINGS > OK • **Proportional** control transfers increasing pressure to increasing driving speed. • **Switched** control operates at a defined, fixed driving speed.
Default sens.setup  	Set the default sensitivity settings: Press OK > Sensitivity settings with indication MASTER MODE See section Sensitivity settings above and in the IFU for settings. Be aware that the settings entered as master settings are the ones that will be restored when the user restores the Master settings. Make sure to save the new default master sensitivity settings after changes are done > OK to exit > SAVE MASTER SETTINGS > OK
Display Adaptations Table 	Informative view on the sensitivity values of each sensor input. • Column 1: input slot • Column 2: MAN-L = value of 'low' sensitivity as set manually • Column 3: AA-L = current value of 'low' sensitivity as result of adaptive algorithm function • Column 4: MAN-H = value of 'high' sensitivity as set manually • Column 5: AA-H = current value of 'high' sensitivity as result of adaptive algorithm function

▲▼1	MAN-L	AA-L	MAN-H	AA-H
Forw1	10	11	80	73
Forw2	10	9	80	69
Left1	10	12	30	32
Left2	10	6	30	39
Rght1	10	2	30	28
Rght2	10	13	30	31
Rev	10	20	80	85

	For more detailed explanation about these values, contact CoMoveIT. To change manually set values, refer to the section 'sensitivity settings'. AA values cannot be changed. These change according to the adaptive algorithm. To exit, press OK.
SAVE MASTER SETTINGS	If you want to save your changes to the master settings, select SAVE MASTER SETTINGS > OK first, then Exit.
EXIT 	Go to EXIT If you want to save your changes to the master settings, select SAVE MASTER SETTINGS > OK first, then Exit. If you exit without SAVE MASTER SETTINGS, your changes will not be saved.
Save & Exit System settings 	OK to save and exit system settings

Message codes on the ECU display

In message codes 101 - 120, ECU sensor input slots are referenced as

Code	Code	Sensor input
101	111	Forw 1
102	112	Forw 2
103	113	Left1
104	114	Left 2
105	115	Right 1
106	116	Right 2
107	117	Rev 1
108	118	User switch
109	119	Out select
110	120	Relax mode

Message code	Description	What to do?
Note: If at occasion of any of the messages, the functionality is not as expected, contact CoMoveIT. If the functionality is as expected, the problem was resolved by the action taken.		

1	General	• Message disappears after 1 min => no action required. • If the message is persistent, contact CoMoveIT
101…110 	Sensor short-circuit	If at plugging a jack in or out the ECU • the message might appear and will disappear after one minute (or pressing OK) => no further action. Else • the message pops up and disappears after 1 min => Check connection and cable of the sensor. There might be an unstable connection of a jack connector. • Message remains after 1 min without action taken => Check connection and cable of the sensor. These might be damaged causing continuous activation.
111…120	Sensor open-load	If at plugging a jack in or out the ECU • the message might appear and will disappear after one minute (or pressing OK) => no further action. Else • The message pops up and disappears after 1 min => Check connection and cable of the sensor. There might be an unstable connection of a jack connector. • Message remains after 1 min without action taken => Check connection and cable of the sensor. These might be unconnected or damaged not allowing activation anymore.
151	Settings & Long-term adaptation storage issue	• Message appears for the first time => Reboot the device and check the settings. If the settings are corrupted, contact CoMoveIT. • If the message is persistent, contact CoMoveIT
152…156	Internal subsystems: memory, RTC, IMU, Bluetooth, CDC	• Message appears for the first time => Reboot the device, check the functionality. If the message is persistent, contact CoMoveIT
301	DAC issue	**This will immediately stop usage, and all output signals are removed.** • Message appears for the first time => Reboot the device, check the functionality. • If the message is persistent, contact CoMoveIT
500	Watchdog	**This will immediately stop usage, and all output signals are removed.** • Message appears for the first time => Reboot the device, check the functionality. • If the message is persistent, contact CoMoveIT
1001	*ERR_OUT_STAGE = 1001*	**This will immediately stop usage, and all output signals are removed.** • Message appears for the first time => Check the DB9 connections or cables. Reboot the device, check the functionality. • If the message is persistent, contact CoMoveIT
1002	*ERR_REF_SOURCE = 1002*	**This will immediately stop usage, and all output signals are removed.** • Message appears for the first time => Check the DB9 connections or cables. Reboot the device, check the functionality.

		• If the message is persistent, contact CoMoveIT

Wheelchair Controller programming

⚠ WARNING!

Programming should only be conducted by qualified professionals with in-depth knowledge of programming the wheelchair controller parameters. Incorrect programming could result in an unsafe set-up for you and your device.

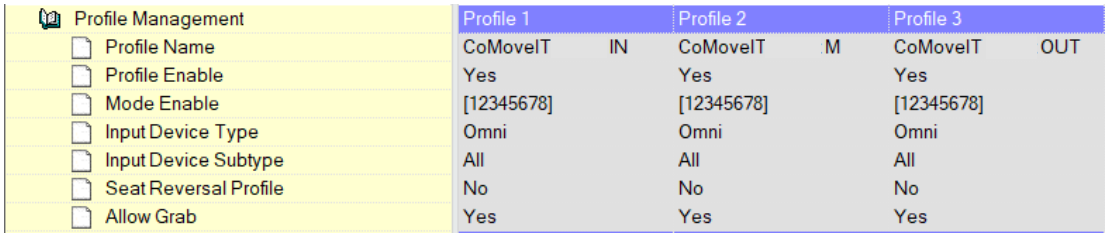
⚠ WARNING!

Programming should only be done in accordance with the safety rules, safety instructions, instructions for use and installation manuals from the wheelchair controller device. Incorrect programming could result in an unsafe set-up for you and your device.

R-net configuration

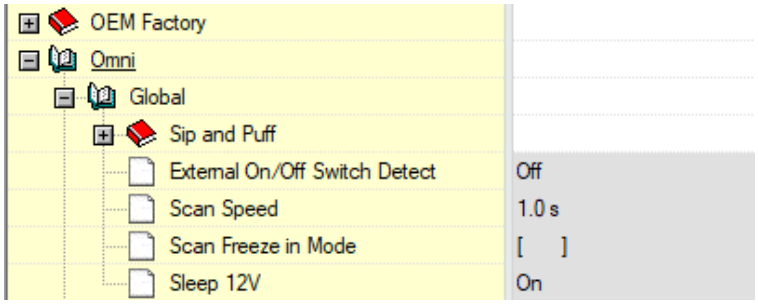
Set the following parameters in the R-net programmer and write them to the controller of your powered wheelchair.

- **Profile Management >** Create driving Profiles for CoMoveIT Flex. Recommended to program one for indoor driving, one for outdoor driving and one with in between speed settings.
- **Profile Management > Input Device Type:** set this parameter to **Omni**.



- **Omni > Global > Sleep 12V > On**

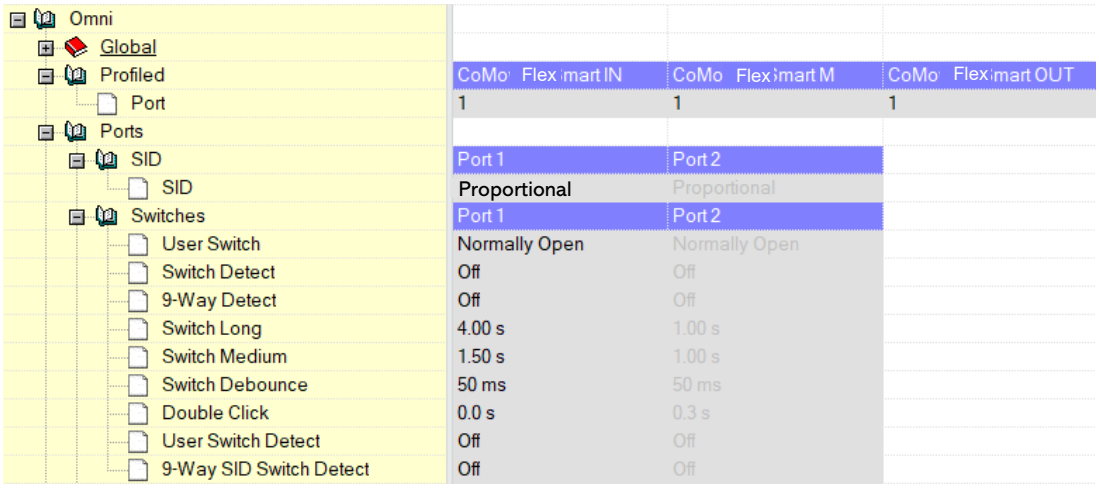
Note: Activating Sleep 12V is mandatory when the Relax function of CoMoveIT FLEX is used.



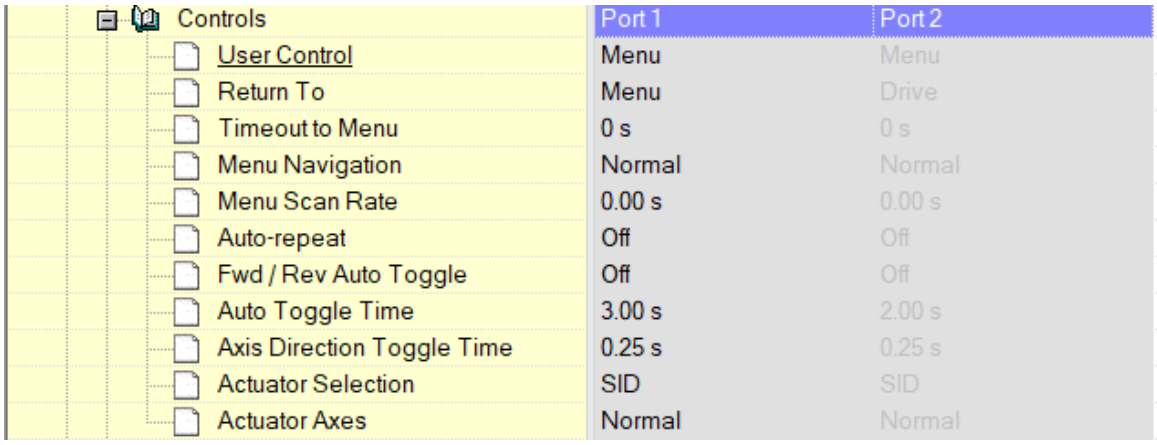
- **Omni > Port:** select the Omni port in which CoMoveIT Flex is connected.
- **Omni > Ports > SID:** Set SID parameter to Proportional:
  - If only 3 driving commands forward, left and right are used, the wheelchair controller shall be configured in 3-axis proportional driving. If also reverse is

used as separate command, the wheelchair controller shall be configured in proportional control.

- **Omni > Ports > Switches:** Set **Switch Detect**, **9-Way Detect**, **User Switch Detect** and **9-Way SID Switch Detect** to **Off**.



- **Omni > Ports > Controls:** Set **Fwd /Rev Auto Toggle** to **Off.**



- ***In case of a 3 sensor configuration*: Omni > Ports > Controls:** Set **Fwd /Rev Auto Toggle** to **On**
  - Press and release FWD/REV within “Auto Toggle Time” will change driving direction.
  - Activate again within “Auto Toggle Time” will initiate driving.
  - No action within “Auto Toggle Time” reverts to original driving direction

For installations with OMNI2 controller:

If an error code appears on the Omni2 display, please consult the following Table. Errors appear as text displayed on the OMNI 2 display as text messages accompanied by an ID code. Do not try to solve this problem yourself, please ask for support from your local distributor.

R-net Error Codes

Error ID	Error Name	Text Displayed on OMNI	Remedy #
0704	12V Supply Failure		1
0808	Joystick Error	Omni Input Joystick Error	2
080A	Joystick Error	Joystick Error	3
080B	Joystick Error	Joystick Error	3
0905	SID Detached	SID Disconnected	3
09B1 or 09D1	Omni Input	Omni Input SID Detached Error	4
09D0-D2 or 09C0-C2	SID Fault	Omni Input SID Error	5
0E00	Joystick Error	Joystick Error	3
0E02	Joystick Error	Joystick Error	3
1E07	User Switch Detached	Switch Error	6
1E40 or 1E42	Omni Input	User Switch Error	7
1E54 or 1E64	Omni Input	Omni Input Module Error	8
2F01	Center Joystick	Center Joystick	3
8146	Omni Input	Omni Input Module Error	9

Remedy 1

Perform the following steps:

- Check the condition and charge level of the batteries.
- Ensure the connections between the batteries and power module are tight and the cables are not damaged.
- Ensure the connections between the motors and power module are tight and the cables are not damaged.
- Remove and restore power to the Drive System by turning the Circuit Breaker off/on or by disconnecting the Main Fuse from the batteries and reconnecting it.

Remedy 2

The most common cause of this error is if CoMoveIT Flex is disconnected from Omni2.

- Check the DB9 cable between the Omni and CoMoveIT Flex.
- If the error persists, in the Rnet programmer go to: **Omni > Ports > SID:** Set SID parameter right **(Proportional, or 3-Axis Proportional).**

Remedy 3

The most common cause of this error is if the joystick is deflected away from center, or a sensor of CoMoveIT Flex is pressed before or during the time the control System is switched on. The joystick displaced screen will be displayed for 5 seconds, if the pressure from a sensor of CoMoveIT Flex is not released within that time, then an error is registered.

- Ensure that any sensor of CoMoveIT Flex is not pressed before or during the time you power on the wheelchair. Power cycle your wheelchair.
- If the error persists, in the Rnet programmer go to: **Omni > Ports > SID:** Set SID parameter right **(Proportional or 3-Axis Proportional).**

Remedy 4

- Check the DB9 cable between the Omni and CoMoveIT Flex.
- If the error persists, in the R-net programmer go to: **Omni > Ports > Switches:** Set **9-Way Detect** to **Off**.
- If there is switch connected to OMNI 2 and e-stop message is displayed on the Omni2 display during power up, in the R-net programmer go to: **Omni > Switches:** Set **User Switch** to **Normally Open** or **Normally Closed**, based on the type of switch you are using.

Remedy 5

- Power cycle your powered wheelchair (Turn your powered wheelchair off and on).
- Check the cable between the Omni and CoMoveIT Flex.
- If the error persists, reconnect the cable or replace the cable.

Remedy 6

The Omni has detected that the User Switch has become disconnected from the U1 or U2 port of the Omni.

- Check all cables and connectors between the Omni ports and the User Switch. If the trip is still present after the above checks have been made, then the User Switch may be defective. Try replacing it with a known good switch.
- If it is required to use the Omni without a User Switch being connected, in the R-net programmer go to: Omni > Switches: Set **Switch Detect** to **Off.**
- Plug a switch in the Omni U port or set **Switch Detect** to **Off** in the R-net Programmer.

Remedy 7

- In the R-net programmer go to: **Omni > Switches >:** Set **User Switch Detect** to **Off**.

Remedy 8

- In the R-net programmer go to: **Omni > Switches >:** Set **9-Way SID Switch Detect** to **Off**.

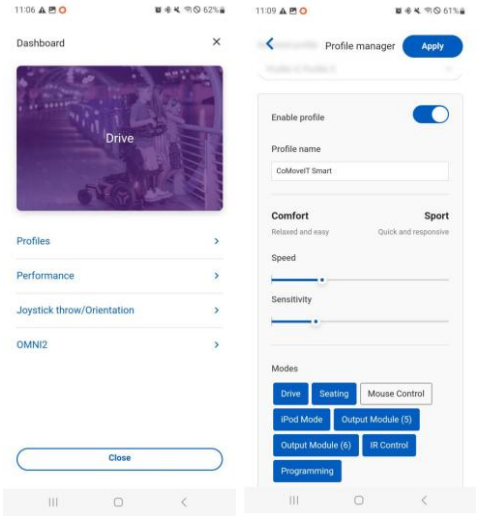
Remedy 9

- Check the cable between the Omni and CoMoveIT Flex.
- Reconnect the cable or replace the cable.

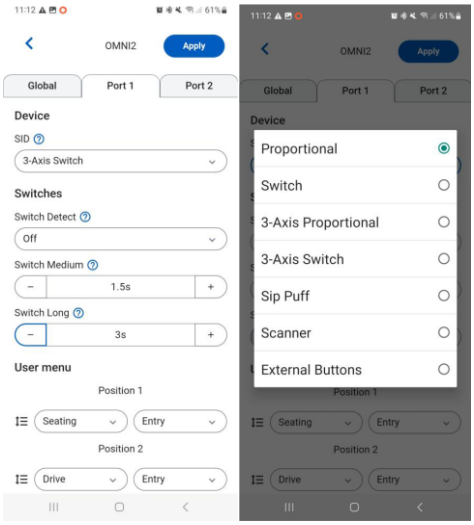
Permobil Power Platform Configuration

Set the following parameters in the programmer and write them to the controller of your powered wheelchair.

- **Profiles > Profile Manager >** Create driving Profiles for CoMoveIT Flex



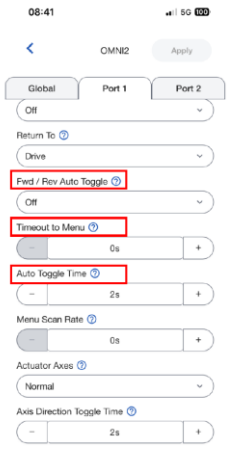
- **Omni2 > Sleep 12V 'On'**
- **Omni2 > Select Port > select SID type**



  - If only 3 driving commands forward, left and right are used, the wheelchair controller shall be configured in 3-axis proportional driving. If also reverse is used as separate command, the wheelchair controller shall be configured in proportional control.
- **Omni2 > Select Port > select Switch Detect 'Off'**
- Press **'Apply'**
- **Omni2 > Advanced configuration**
  - Switch Detect 'Off'
  - 9-way Detect 'Off'
  - 9way SID Switch Detect 'Off'
  - User Switch Detect 'Off'

- Press **'Apply'**
- **Omni2 > Select Port > Fwd /Rev Auto Toggle** : set to '**Off**'

- **Omni2 > Select Port > Time Out to Menu**
  - Sets the period of SID inactivity before the User Menu will appear
    - 0s to 60s in steps of 1s (0s = time out inactive)

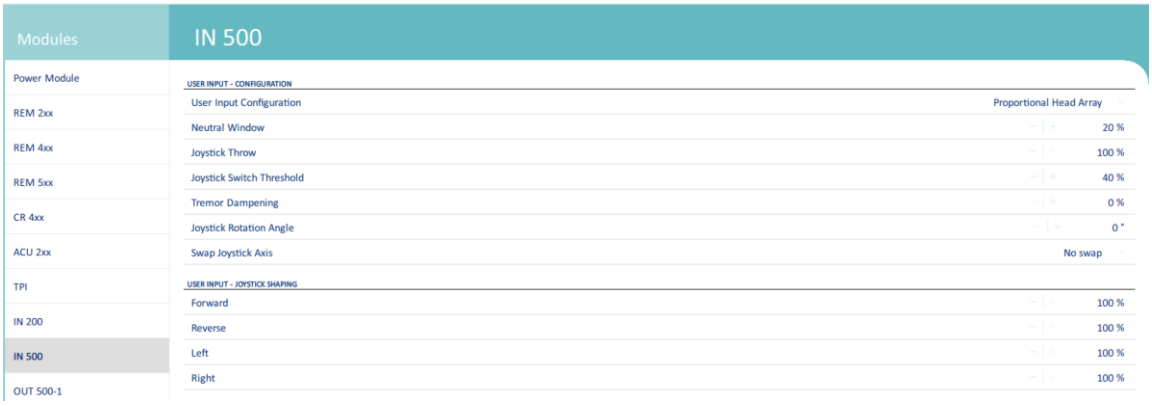


- ***In case of a 3 sensor configuration***:
  - **Omni2 > Select Port > Fwd /Rev Auto Toggle** : set to **ON**
    - Press and release FWD/REV within "Auto Toggle Time" will change driving direction.
    - Activate again within "Auto Toggle Time" will initiate driving.
    - No action within "Auto Toggle Time" reverts to original driving direction
  - **Omni 2 > Select Port > Auto Toggle Time**
    - Sets the time for drive direction change in FWD/REV Auto Toggle
      - 0.25s to 5s in steps of 0.25s

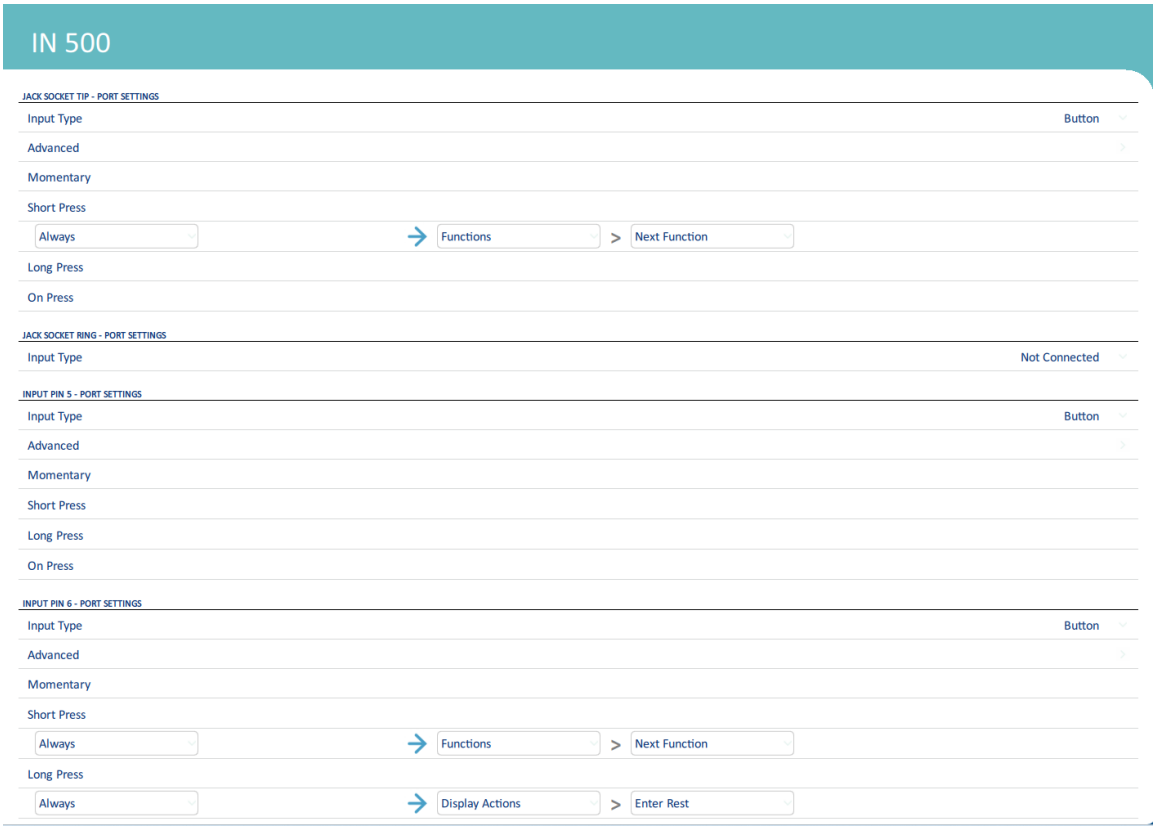
Dynamic controls configuration (LiNX IN500-A)

Set the following parameters in the programmer and write them to the controller of your powered wheelchair.

- Connect: Open the **LiNX Access** tool and connect to the wheelchair system.
- Navigate: Go to **Modules → IN500**.
- Select **User Input Configuration**.
- Select the input type Proportional Head Array.
- Set **Neutral Window → 20%.**
- Set **Joystick Throw → 100%.**
- Set **User Input – Joystick Shaping → All 100%.**

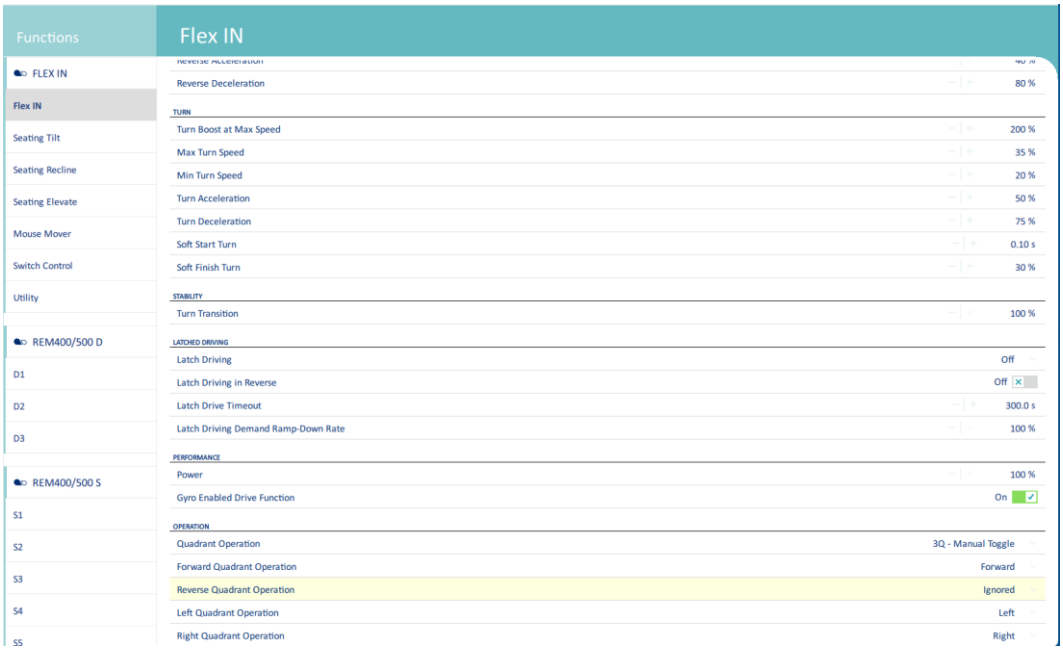


- Select **Input Pin 6 – Port Settings**.
- Set **Short Press – Always → Functions > Next**.
- Set **Long Press – Always → Display Actions > Enter Rest.**

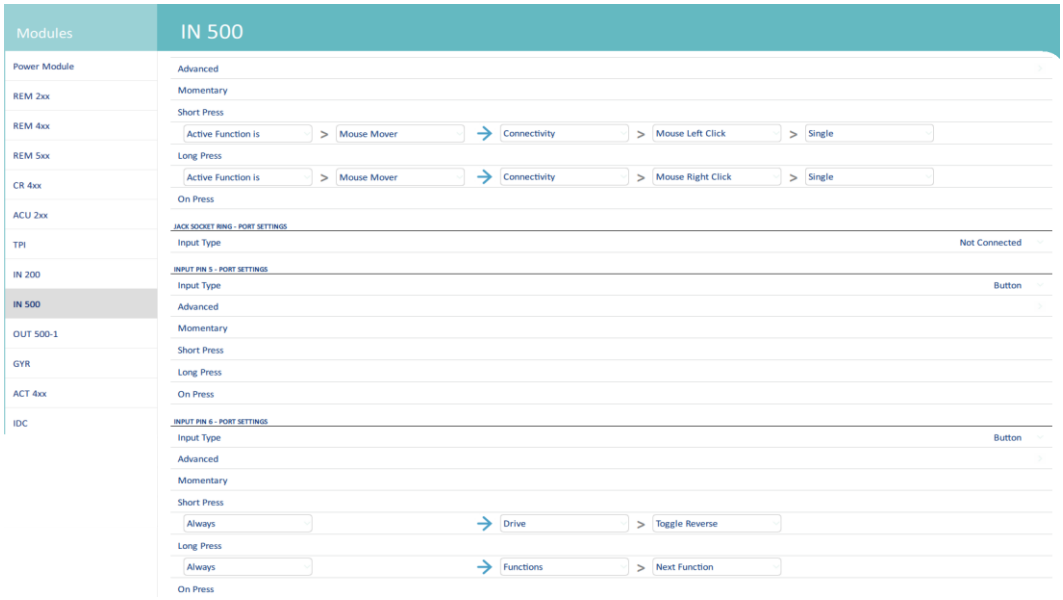


- Save: Click **Write to chair**.

- ***In case of a 3 sensor configuration***:
  - Navigate: Go to **Drive Function.**
  - Select **Operation.**
  - Set **Quadrant Operation → 3Q – Manual Toggle.**
  - Set **Reverse Quadrant Operation → Ignored.**



- Navigate: Go to **Modules → IN500**.
- Select **Input Pin 6 – Port Settings**.
- Set **Short Press – Always → Drive > Toggle Reverse**.
- Set **Long Press – Always → Functions > Next Function.**

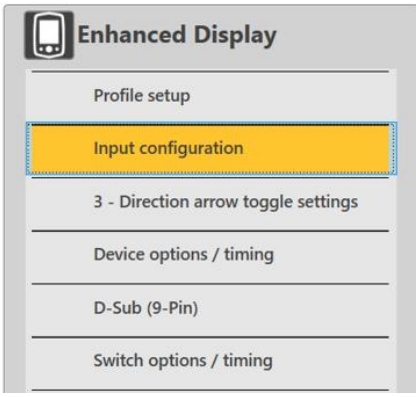


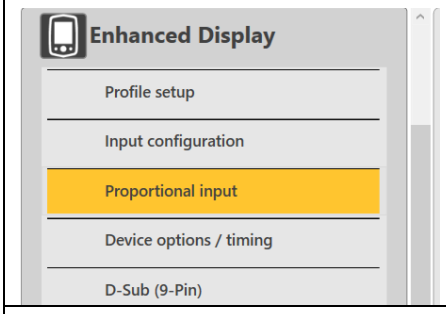
- Short press on the User Switch of CoMoveIT Flex > Selects Forward/Reverse.
- Long press on the User Switch of CoMoveIT Flex > Selects Next Function.

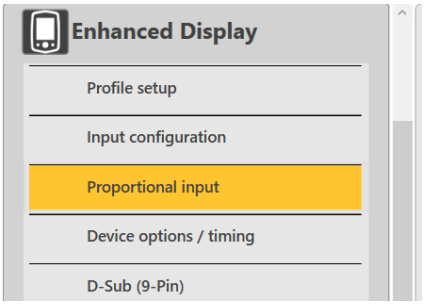
⚠	**CAUTION**
In 3-sensor configuration: Rest is not displayed in the wheelchair when Flex is in Relax mode.	

Curtis Instruments configuration (Enhanced Display / SCIM)

Open ECON-W software and set the following parameters.

<table>
<tr>
<td> 
</td>
<td>Enhanced Display > Input Configuration >
• Proportional
• 3-Direction Proportional

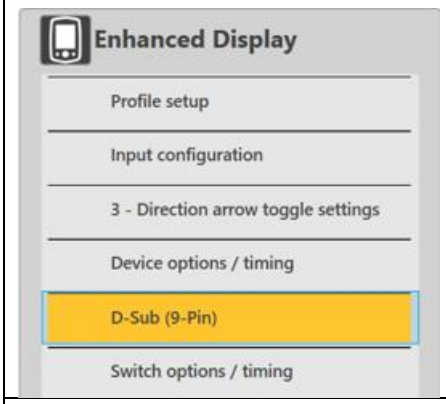
If only 3 driving commands forward, left and right are used, the wheelchair controller shall be configured in 3-direction proportional. If also reverse is used as separate command, the wheelchair controller shall be configured in proportional.</td>
</tr>
<tr>
<td> 
</td>
<td>Enhanced Display > Proportional Input >

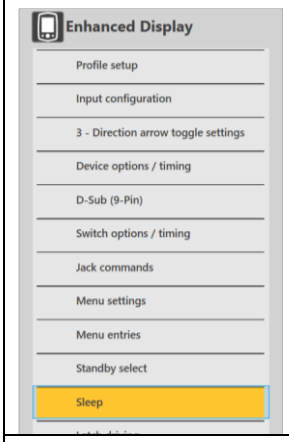
• Center Deadband > 20%
• Auto center adjust > Disabled</td>
</tr>
<tr>
<td> 
</td>
<td>Enhanced Display > Proportional Input >

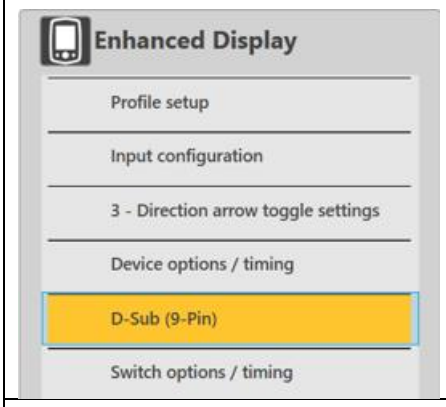
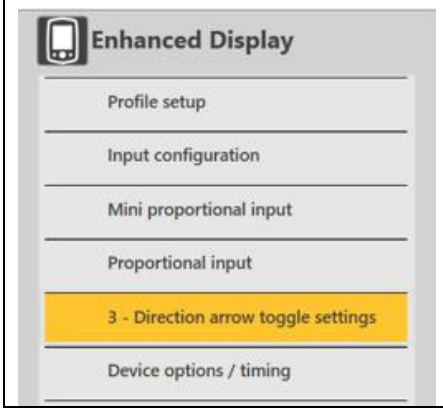
• Proportional calibration > Start

Important!
Before running the proportional calibration, set CoMoveIT Flex to SWITCHED Driving.
SWITCHED driving is set via the Electronics Control Unit of FLEX in the settings tab.

• After successful calibration > save new values</td>
</tr>
</table>

<table>
<tr>
<td> 
</td>
<td>Enhanced Display > D-Sub (9-Pin) >

• D-Sub supervision > Enabled
• Mode short command type > Mode
• Mode long command type > Sleep
• Mode long command type must be higher than 1500 ms</td>
</tr>
<tr>
<td> 
</td>
<td>Enhanced Display > Sleep >

• Sleep power mode > Enabled
• Wake up > Mode switch</td>
</tr>
<tr>
<td> 
</td>
<td>If 3-direction proportional is required:
Enhanced Display > D-Sub (9-Pin) >
• D-Sub supervision > Enabled
• Mode short command type > Toggle
• Mode long command type > Mode</td>
</tr>
<tr>
<td> 
</td>
<td>If 3-direction proportional head is required:
Enhanced Display > 3 – Direction arrow toggle settings >
• Toggle in drive > Disabled
• Toggle while driving > Disabled
• Toggle in seat > Disabled</td>
</tr>
</table>

Test before use

After installation of CoMoveIT Flex, execute the following tests before the wheelchair is used.

Inspect intactness

Check whether:

- All parts of CoMoveIT Flex are not damaged.
- The footpads are attached to the footrests of the wheelchair using the provided Velcro.
- The headrest can move up and down in its whole range.
- All head array mechanism are operational.
- Cabling from headset and footpad(s) are fixated away from pinch points and sharp objects.

⚠ WARNING!

Electrically powered mechanisms of you wheelchair can act as pinch points for your device.

Operational test

1) Switch on the wheelchair.
2) Observe any message codes on the ECU of Flex and in the wheelchair interface.
3) Press each of the connected sensor pads until you hear the parking brake disengage.
4) Release the sensor pad, and hear the parking brake engage.
5) Repeat steps 3 and 4 a few times , for each of the sensor pads connected to Forw 1, Forw 2, Right 1, Right 2, Rev.
6) Check any sensors used as User switch, Out Select and Relax mode.

Drive test

- Drive the wheelchair in all directions using CoMoveIT FLEX and observe if there is any abnormal behavior.
- Check all the functionalities of the wheelchair.
- Operate moving parts of the wheelchair (seating, footrests, etc.) and ensure cabling from head array and footpad(s) do not inhibit their functionality.

Maintenance

⚠ WARNING!

In case excessive wear of any of the pads, it is mandatory to contact your local authorized dealer and have the worn parts replaced.

Maintenance is important for the safety and performance of your CoMoveIT Flex.

Perform a monthly inspection to ensure that:

- All rotary knobs are in place and in good shape.
- All bolts and screws are tightened.
- All cabling and connectors are undamaged and connections are tight.
- There is no excessive wear to any parts of the device, especially the pads of the head array and the top layer of the foot pad(s).
- The fixation Velcro of the footpads offers an adequate grip.

Let your local distributor perform a yearly check of the wheelchair and the subsystems.

Cleaning

⚠ **WARNING!**
Never spill water or use a water hose to clean CoMoveIT Flex parts to avoid damage.

⚠ **WARNING!**
Do not clean the device while in use by the patient.

⚠ **CAUTION**
Do not use aggressive cleaning agents or additional lubricants.

⚠ **CAUTION**
Water might affect the operation of sensors. Make sure that all parts and surfaces are completely dry before use.

⚠ **CAUTION**
Cleaning contributes to the overall hygienic condition of your device, especially on the pads where your head is in contact with. Failure to clean on a regular basis, might cause excessive sweat and dirt build up on the cushions of the head array.

Metal and plastic parts	Clean with a damp cloth. In case of excess dirt concentration, a soap water solution can be used. Always wipe dry after cleaning.
Head array pads	Clean weekly with a damp cloth using water or a soap water. During hot weather conditions, clean them every day since sweat concentration might be increased. Gently, wipe dry after cleaning. ⚠ **WARNING!** In case excessive wear of any of the head pads, it is mandatory to contact your local authorized dealer and have the worn parts replaced.
Footpads	Clean with a damp cloth using water or a soap water solution. Wipe dry after cleaning. ⚠ **WARNING!** In case excessive wear of any of the foot pads, it is mandatory to contact your local authorized dealer and have the worn parts replaced.

Troubleshooting

If your device does not react as expected, check the following:

- Make sure the wheelchair, the wheelchair controller and the CoMoveIT ECU are powered on.
- Make sure that the sensors are connected to the ECU.
- Make sure that the cable between CoMoveIT Flex and the controller (e.g. Omni module) is connected, tightened and connected to the right programmed port.

If one of the components no longer works, contact your local distributor.

Trouble	Remedy
No wheelchair movement when pressing a sensor	• Check if the wheelchair controller profile is set for usage with CoMoveIT Flex. • Check if set in Driving mode. • Check if the used sensor is connected in the ECU. • Decrease the 'low' sensitivity and increase the 'high' sensitivity • Make sure the used wheelchair controller port is correctly programmed in the wheelchair controller software. • Check for damage on cable, connector or sensor pad.
Functions get activated too easily	• Increase both 'low' and 'high' sensitivity of the functions that are activated to easily. • Check for damage on sensor pad • In case of a footpad, make sure to replace a worn footpad top layer.
Pushing to drive forward but driving backwards	• Check that the used sensor is connected to Forw1 or Forw2 in the ECU and not in the Rev input. • Push that sensor only and not the Reverse sensor at the same time – to avoid this from happening in normal use, increase the 'low' sensitivity for the Reverse sensor. • Check the programming of the wheelchair controller (joystick axis, motor swap)
Pushing to the right turns left and/or vice versa	• Check that the used sensor is connected correctly • Check that the head array is mounted with the ID label on the bottom • Set the head array side bar in a higher position and tilt the side pads, or don't connect the rearmost side pads.
Glasses hinder to push the side pads	• Use the bottom rotary knob to position the side pads higher.
Out select doesn't switch	• Make sure to push for a duration as defined in the setting Out select channel delay (System settings)
Hearing beeps while pushing	• When you're in Relax (sleeping) mode, beeps will be heard when pushing sensors. • When you are not in Relax mode, an error might be displayed on the ECU.
Message codes are shown on the ECU display	• Only if error codes remain displayed during driving or when driving is not possible and error codes are visible, consult this document or contact CoMoveIT for assistance.

Error codes are shown on the wheelchair controller	• Ensure that any sensor is not pressed before or during the time you power on the wheelchair. Power cycle your wheelchair. • If the error persists, consult this document or contact CoMoveIT for assistance.
Side pad is lever is loose even when the lever is closed	• Ensure that the little screws under the lever of the sensing pad are in place. • Follow the instruction in Service, sensing pad with lever step 9 to tighten them appropriately. **⚠ WARNING** If the tiny screws are too tight, the side pad block might break during the operation of the lever. Always tighten these screw by turning then ¼ of a full turn each time.

Removal

⚠ CAUTION

It is recommended that the removal of the product is done by qualified personnel and according to the Installation manual which can be downloaded from www.comoveit.com

Removal steps:

- Switched the wheelchair off.
- Remove tie wraps and disconnect all cables.
- Remove the head array, the foot pads and the ECU.

Scrapping

⚠ CAUTION

Follow the local waste legislation for scrapping. Dispose of obsolete electronic parts responsibly in accordance with local recycling regulations.

Service

⚠ WARNING!

Before any service procedure do the following:

- Switch off the wheelchair.
- Disconnect the part of FLEX that needs service.

The device can not be serviced while in use with a patient.

Back head rotary knobs

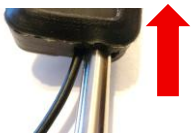
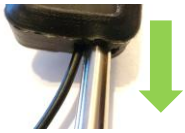
	1. Locate the missing or to be replaced rotary knob.
	2. Take one rotary knob.
	3. Place one nylon washer on the rotary knob.
	4. Place the spring on the rotary knob on the top of the nylon washer.
	5. Place one nylon washer on the top of the spring.
	6. Screw the rotary knob to the head array. Note: Ensure that the nylon washers and spring are in place before screwing to the head array.

End stoppers

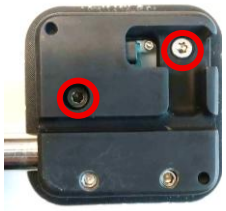
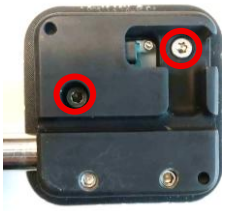
	1. Locate the damaged or missing end stopper.
	2. Remove the damaged end stopper. • Use a set of pliers and pull firmly.
	3. Insert and press the new end stopper to the shaft.

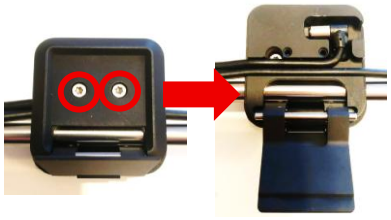
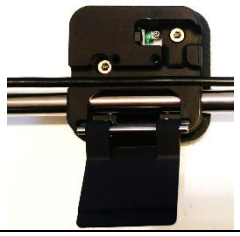
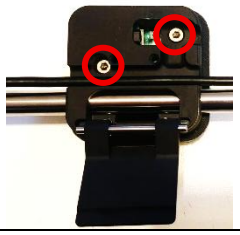
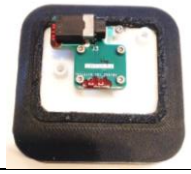
Circumferential cushion

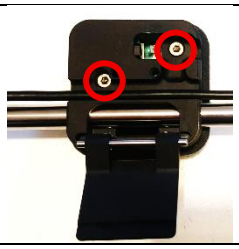
	1. Remove the circumferential cushion by pulling it firmly.

	2. Disconnect the jack connector.
	3. Losen the two screws.
	4. Remove the sensing pad from the shaft.
	5. Remove the old circumferential cushion from the shaft.
	6. Insert the shaft and jack connector through the slot of the new circumferential cushion.
	7. Place the sensing pad to the shaft.
	8. Connect the jack connector.
	9. Tighten the two screws. Note: The shaft must be fixated 2mm deeper than the edge of the side pad body. 
	10. Attach the new circumferential cushion to the sensing pad.

Cushion

Fixed sensing pad cushion	
	1. Remove the circumferential cushion by pulling it firmly.
	2. Disconnect the jack connector.
	3. Remove the two screws.
	4. The sensor plate is separated form the sensing pad block.
	5. Remove the old cushion from the sensor plate.
	6. Attach the new cushion to the sensor plate. Note: The narrow side of the cushion must be above the PCB.
	7. Attach the sensor plate to the block of the sensing pad using the two screws.
	8. Connect the jack connector.

	9. Attach the new circumferential cushion to the sensing pad.
Lever sensing pad cushion	
	1. Open the lever.
	2. a) Remove the two screws. b) Remove the cover.
	3. Unplug the jack connector.
	4. Remove the two screws.
	5. The sensor plate is separated form the sensing pad block.
	6. Remove the old cushion from the sensor plate.
	7. Attach the new cushion to the sensor plate. Note: The narrow side of the cushion must be above the PCB.

	8. Attach the sensor plate to the block of the sensing pad using the two screws.
	9. Plug the jack connector.
	10. Attach the cover using 2 screws.

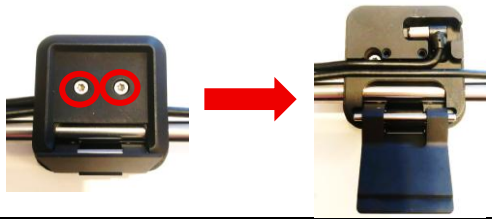
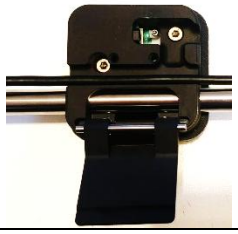
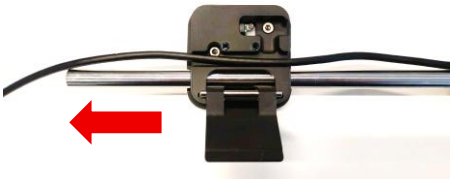
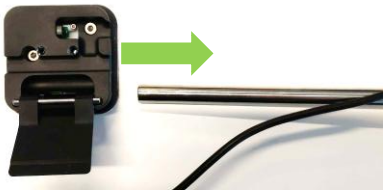
Sensing pad fixed

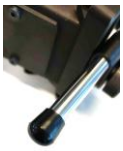
	1. Remove the circumferential cushion by pulling it firmly.
	2. Disconnect the jack connector.
	3. Losen the two screws.
	4. Remove the sensing pad from the shaft.
	5. Remove the old side pad from the shaft.

	6. Place the new side pad to the shaft.
	7. Connect the jack connector.
	8. Tighten the two screws. Note: The shaft must be fixated 2mm deeper than the edge of the side pad body. 
	9. Attach the new circumferential cushion to the sensing pad.

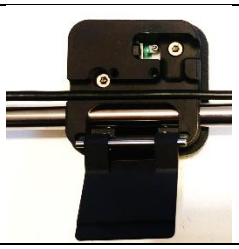
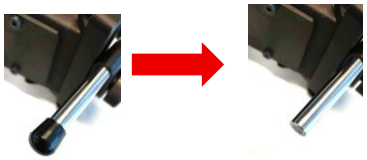
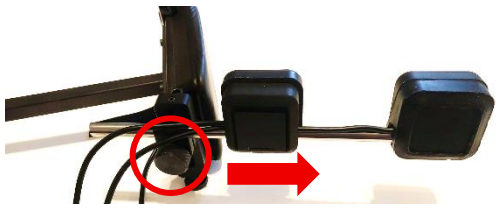
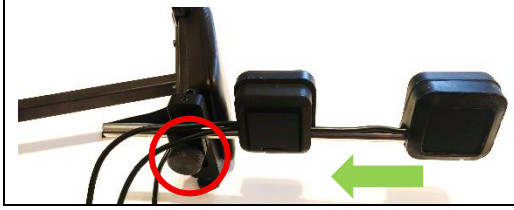
Sensing pad with lever

	1. Remove the end stopper.
	2. Losen the side rotary knob.
	3. Remove the full side pad from the head array.
	4. Open the lever.

	5. a) Remove the two screws. b) Remove the cover.
	6. Unplug the jack connector.
	7. Slide the old lever side pad out of the shaft.
	8. Slide the new lever side pad in of the shaft.
	9. a) Locate the two tiny screws. b) Remove the tiny screws. c) Place the two tiny screws back by turning them maximum 4 turns. **⚠ WARNING** If the tiny screws are too tight, the side pad block might break during the operation of the lever.
	10. Plug the jack connector.
	11. Attach the cover using 2 screws.

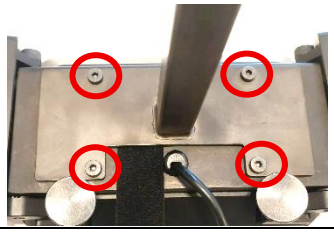
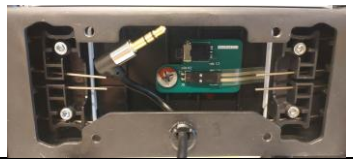
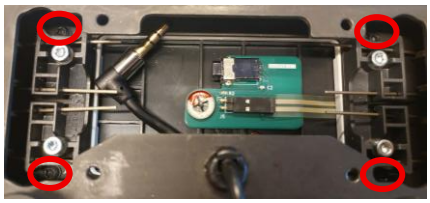
	12. Place the full side pad to the head array and tighten the side rotary knob.
	13. Place the end stopper.

Full side pad

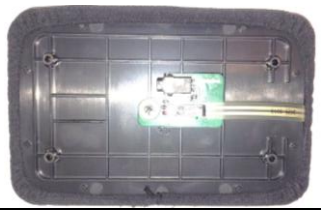
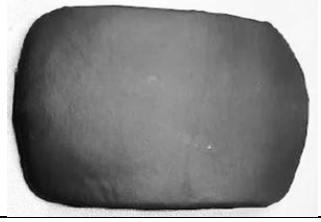
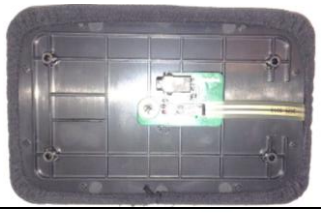
The process of replacing the full side pads requires to disconnect the cable of the fixed sensing pad and of the lever sensing pad.	
	1. To remove the cable of the fixed sensing pad, follow steps 1-2 of the sensing pad fixed removal.
	2. To remove the cable of the lever sensing pad, follow steps 4-6 of the lever sensing pad removal.
	3. Remove the end stopper.
	4. Losen the side rotary knob and slide out the old side pad
	5. Place the new full side pad to the head array and tighten the side rotary knob.

	6. Place the end stopper.
	7. To connect the cable of the fixed sensing pad, follow step 7 of the sensing pad fixed removal.
	8. To connect the cable of the lever sensing pad, follow steps 4-6 of the lever sensing pad removal.

Back head pad

	1. Remove the 4 screws to remove the back adjuster of the head array.
	2. Unplug the jack connector.
	3. a) Remove the 4 screws which are inside the metal frame. b)The old back head pad is released.
	4. Take a new back head pad and position it to the back frame.
	5. Execute steps 1 to 3 in reverse order (3→1).

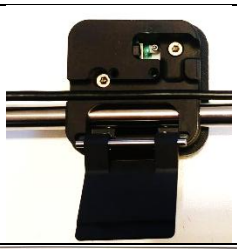
Back head pad cushion

	1. To replace the back head cushion, follow steps 1-3 for the back head pad removal.
	2. Remove the plastic frame.
	3. Remove the old cushion from the back pad.
	4. Take a new cushion to the back head pad. Note: The cushion has a rubber band around it that keeps it in place.
	5. Place the plastic frame.
	6. Execute steps 1 to 3 as given in the back head pad removal in reverse order (3→1).

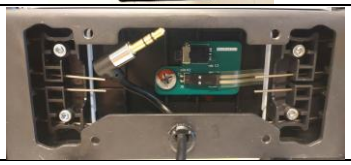
Head array cable set

The process of replacing the head array cable set requires to disconnect the cables of the fixed sensing pads, the cables of the lever sensing pad, and the cable of the back head pad.

	1. To remove the cables of the fixed sensing pads, follow steps 1-2 of the sensing pad fixed removal.



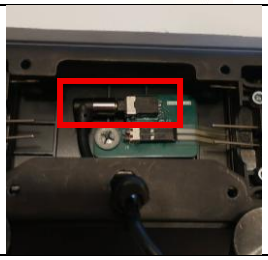
2. To remove the cables of the lever sensing pads, follow steps 4-6 of the lever sensing pad removal.



3. To remove the cable of the back head sensing pad, follow steps 1-2 of back head pad removal.

4. Remove the cable strain relief.

5. Take a new cable set

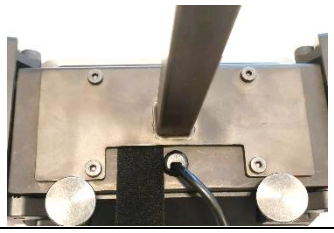


6. Pass the 90° jack of the back head sensor through the hole of the back frame and connect it to the back head PCB.

7. Press the cable grommet in the hole of the back frame.

⚠ WARNING

Connect the cable with the label “back head” to the back head PCB.



8. Attach the back adjuster to the head array.

9. To connect the cables of the fixed sensing pads, follow step 7 of the sensing pad fixed removal.

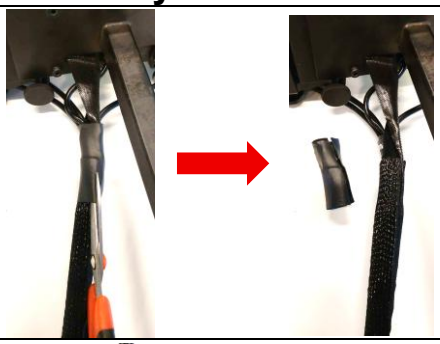
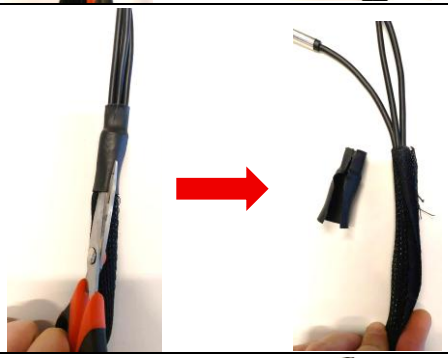
⚠ WARNING

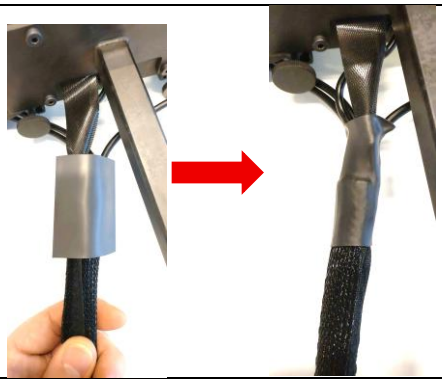
Connect the cable with the label “right front” to the right fixed side pad most to the front.

Connect the cable with the label “left front” to the left fixed side pad most to the front.

	10. To connect the cables of the lever sensing pads, follow steps 4-6 of the lever sensing pad removal. **⚠ WARNING** Connect the cable with the label “right rear” to the right lever side pad most to the back. Connect the cable with the label “left rear” to the left lever side pad most to the back.

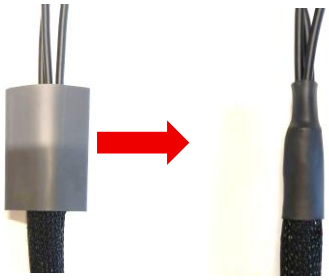
Head array braided sleeve

	1. Cut the heat shrink on the one end of the head array cable set. **⚠ WARNING** Be extremely careful when cutting the heat shrink. Do not damage the cables.
	2. Cut the heat shrink on the other end of the head array cable set. **⚠ WARNING** Be extremely careful when cutting the heat shrink. Do not damage the cables.
	3. Remove the old braided sleeve by opening the Velcro.
	4. Place the head array cables in the new braided sleeve and close the Velcro.



5. Place a new heat shrink on the one end of the head array cable set and heat it up.

> **⚠ WARNING**
>
> Use a hot air gun. The temperature must not exceed 80°C / 176°F.



6. Place a new heat shrink on the other end of the head array cable set and heat it up.

> **⚠ WARNING**
>
> Use a hot air gun. The temperature must not exceed 80°C / 176°F.

Head array one cable

The process of replacing the head array one or more cables of the headset set requires to disconnect the damaged cables of the fixed sensing pads and/or the cables of the lever sensing pad and/or the cable of the back head pad. Additionally, you must remove the braided sleeve.

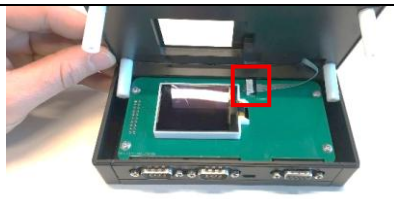
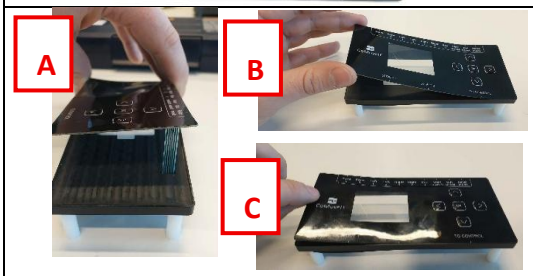
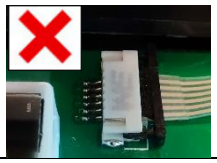
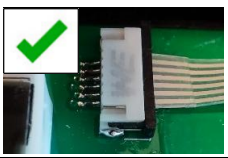
1. To remove the braided sleeve follow steps 1-3 of the head array braided sleeve removal instructions.

2. To remove the damaged cable:
- If cables of the fixed sensing pads must be replaced, follow steps 1-2 of the sensing pad fixed removal.
- If cables of the lever sensing pads must be replaced, follow steps 4-6 of the lever sensing pad removal.
- If the cable of the back head sensing pad must be replaced, follow steps 1-2 of back head pad removal.

3. To connect a new cable:
- To connect new cables of the fixed sensing pads, follow step 7 of the sensing pad fixed removal.
- To connect new cables of the lever sensing pads, follow steps 4-6 of the lever sensing pad removal.
- To connect new cable of the back head pad, follow steps 6-7 of the head array cable set removal.

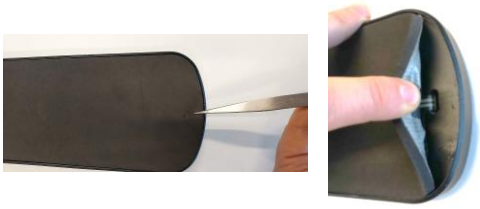
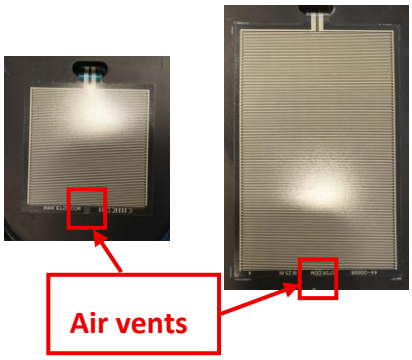
4. To insert the cables in the braided sleeve and attach the heat shrink to the cable, follow steps 4-6 in head array braided sleeve service.

ECU membrane buttons

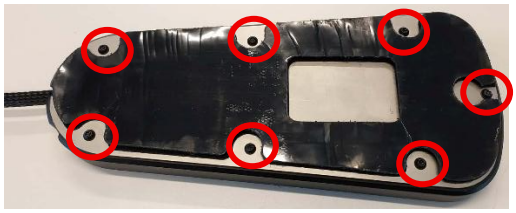
	1. Remove the 4 screws on the bottom of the ECU.
	2. This allows you open the top lid of the ECU
	 3. Disconnect the tail of the membrane buttons from the connector of the Display PCB. Note: Unlock the connector before pulling the m tail.
	4. Remove the old membrane from the top lid.
	5. Take new membrane buttons.
	6. Peel of the adhesive liner from the membrane buttons. A) Insert the tail of the membrane buttons through the slot of the control box lid. B-C) Adhere the membrane buttons to the top of the top lid in a smooth motion from right to left.
	7. Connect the tail of the membrane buttons to the connector of the Display PCB.  

	8. Place the 4 screws to the bottom of the ECU.

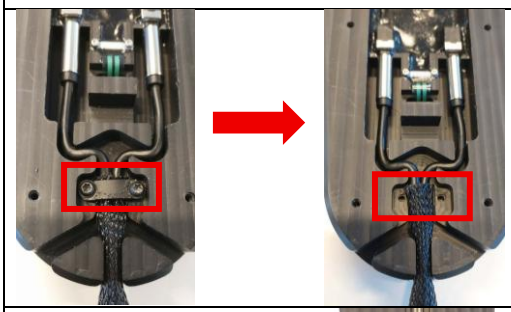
Footpad cover

	1. Pull carefully to remove the damaged sticker from the footpad
	2. Once the sticker is removed, observe for any adhesive residues
	3. If you spot adhesive residue, please wipe them clean with alcohol. Pour a small amount of alcohol on a piece of cloth and wipe the adhesive residues. ⚠ **WARNING** Use a small amount of alcohol and prevent the alcohol from inserting the air vents of the sensor. If the alcohol enters the air vents of the sensor, the sensor might be irrevocably damaged.
	4. Then stick the EVA pad assembly on the top of the foot pad.
	5. Apply the top cover to the top of the foot pad in a smooth motion from right to left
	6. Press the top cover firmly and carefully, so that it adheres well to the foot pad.

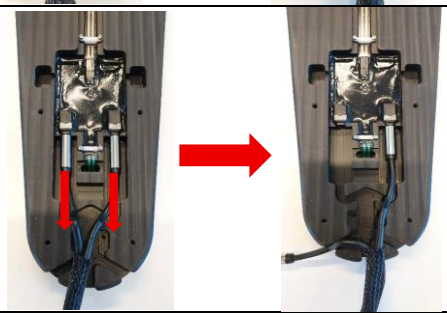
Footpad cable set



1. Remove the 7 screws to remove the metal plate at the bottom of the footpad.

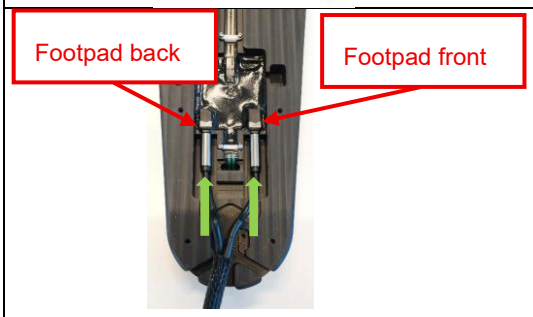


2. Remove the cable holder.



3. Unplug the two jack connectors by pulling firmly.

4. Take a new set of footpad cables.



5. Plug the two jack connectors.

⚠ WARNING

The cable for the footpad back sensor must be connected to the left port.

The cable for the footpad front sensor must be connected to the right port.

6. Attach the cable holder.

	7. Place the metal plate at the bottom of the footpad and tighten all 7 screws.

⚠ WARNING!
After any service procedure, follow the “Test before use” instructions of this document.

Technical specifications

SPECIFICATIONS	
System Name	CoMoveIT Flex
Interface Connection	DB9 RS232 Serial Cable – Male to Female
Interfaces	PG Drives Technology R-net OMNI 2, PG Drives Technology R-net Input/Output Module, Q-Logic 3 EX Enhanced Display, Curtis Instruments AG Display Module, LINX IN 500
Operating Forces	50 gr~15 kg (depending on the sensitivity settings)
Operating Voltage	12V DC
Maximum Current Usage	Driving mode: 70 mA Out control mode: 95 mA
SID Control Type	Proportional, 3-Axis Proportional. Switched driving selectable from the Flex ECU.
Head Force Sensor Connection	3,5 mm stereo jack male 90° angle to 3,5 mm stereo jack male straight
Foot Force Sensor Connection	3,5 mm stereo jack male straight to 3,5 mm stereo jack male straight
Output connection	DB9 RS232 Female to 7x 3,5mm mono jacks cable

External DB9 pin mapping ‘OUT1 / OUT2’ (functional intent)

When operating in external mode, the unit conceptually supports these functions on the DB9 connector:

- Pin 1: Forward → Forward1
- Pin 2: Reverse → Reverse
- Pin 3: Left → Left1
- Pin 4: Right → Right1
- Pin 5: Ground (linked to pin 8)
- Pin 6: Mode → User switch
- Pin 7: Left 2 → Left2
- Pin 8: Ground
- Pin 9: Right 2 → Right2

CoMoveIT

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