

# All-round Joystick Heavy Duty

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Multifunctional operable wheelchair joystick



All-round Joystick Heavy Duty Omni (P002-73) – R-net (P002-77)  
Or version for different wheelchair electronics connection

## Contact & Product

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## All-round Joystick Heavy Duty User & Installation manual

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## Important information about this manual

Congratulations for choosing a mo-Vis product! If you would like to learn more about mo-Vis and its products, we invite you to visit our website: [www.mo-vis.com](http://www.mo-vis.com).

Before you install or begin using this product, it is important that you read and understand the content of these installation and operating instructions, the safety instructions in particular.

The installation instructions will guide you as an installer through the options and possibilities with the mo-Vis product. The additional connection manual is considered as a comprehensive part of this manual. The mo-Vis product should be adjusted with the mo-Vis Configurator software.

The operating instructions are primarily intended to acquaint you with the functions and characteristics of the mo-Vis product and how you can use it in the best manner possible. They also contain important safety and maintenance information, as well as describe possible problems that can arise during use.

Always keep the operating instructions handy in connection with your wheelchair, since the need for important information can arise concerning its use, safety and maintenance.

All information, pictures, illustrations and specifications are based on the product information that was available at the time of printing. Pictures and illustrations shown in these instructions are

representative examples and are not intended to be exact depictions of the various parts of the product.

We reserve the right to make changes to the product without prior notice.

### ***Referenced products***

This manual is valid for the All-round Joystick Heavy Duty.

### ***Ordering documentation***

You can download additional copies of this User & Installation manual on the mo-Vis website: [www.mo-vis.com](http://www.mo-vis.com).

## Support, scrapping and spare parts

### *Technical support*

In case of technical problems, we advise you to contact your dealer.

If the dealer is not available, or unknown, please contact mo-Vis bvba by email [support@mo-vis.com](mailto:support@mo-vis.com) or by phone +32 9 335 28 60.

Always state the device serial number when contacting mo-Vis. This ensures you are provided with the correct information.

### *Spare parts and accessories*

Spare parts and accessories must be ordered by the dealer at mo-Vis bvba.

### *Scrapping & recycling*

For scrapping, adhere to your local waste legislation.

Dispose of obsolete electronic parts responsibly in accordance with local recycling regulations.

# Warranty

mo-Vis bvba warrants the All-round Joystick Heavy Duty to be free from defects in material and workmanship for a period of 2 years under proper use, care & service. All warranties only cover parts and do not extend beyond the initial purchaser from an authorised mo-Vis dealer.

## ***Start of the warranty period***

Each warranty shall begin on the date the product is first delivered to the customer.

## ***Repair and replacement***

For warranty service, we advise you to contact the dealer from whom the product was purchased. In the event of a defect in material or workmanship, the dealer must obtain a return authorisation (RA) number from mo-Vis and the product must be shipped to a service centre designated by mo-Vis. mo-Vis will repair or, at mo-Vis' option, replace any product covered by the warranty.

## ***Disclaimer and Limitations of Remedies***

The express warranties set forth in this agreement are in lieu of all other warranties of merchantability or fitness of purpose. In no event shall mo-Vis be liable for any direct, indirect, incidental or consequential damages resulting from any defect in this product.



Warranty of parts subject to “normal wear and tear” (e.g. pads, joystick balls, batteries ...) are not covered in the warranty except as it applies to defects in material or construction.

### ***Amendments***

No person is authorised to alter, extend or waive the warranties of mo-Vis.

### ***Voiding of warranties***

The foregoing warranties are contingent upon the proper installation, use, maintenance and care of the product. The warranty will be void if the product has been installed or used improperly, or if it has been repaired or any part replaced by persons other than mo-Vis or an authorised dealer. The product, integrated cabling included, is considered as a non-serviceable part.

The addition of equipment or features that are not manufactured or recommended by mo-Vis could affect the intended function of the mo-Vis product and may invalidate the warranty.

### ***Understanding usage***

The health care professional (authorised installer) is responsible for understanding the intended use of the mo-Vis equipment, the specifications and its programming parameters. mo-Vis cannot be held responsible for damage caused by incorrect installation or incorrect use of the product. Misuse, mishandling or storage is not covered by this warranty.

# Safety precautions

## *General*

The All-round Joystick Heavy Duty is intended to be fitted on any power wheelchair with Omni (P002-73) or R-net (P002-77) connection. Other versions for different wheelchair connections are available. Check the Connection manual or contact your dealer or mo-Vis for more information.

Incorrect use or installation may lead to risk of injury to the user and damage to the wheelchair or other property. In order to reduce these risks, read this instruction manual carefully, paying particular attention to the safety instructions and warning texts.

Only install this product on a wheelchair where the wheelchair manufacturer allows the installation of third party parts.

Any unauthorised use of the product may lead to increased risk of accident. Carefully follow the recommendations in this manual in order to prevent accidents from use.

The All-round Joystick Heavy Duty, integrated cabling included, is considered as a non-serviceable part.

In case of doubt for alterations and adjustments, always contact a qualified service engineer.

In case any serious incident occurs in relation to this device, this should be reported immediately to mo-Vis and the competent authority of the Member State in which the user is established.

## **Warning labels**

This manual contains the following warning labels, which are intended to draw attention to situations that could lead to unwanted problems, e.g. personal injury or damage to the wheelchair.



### **CAUTION!**

*Please use caution where the symbol appears.*



### **WARNING!**

*Please use extreme caution where the symbol appears. Failure to observe warnings can lead to personal injury or property damage.*



### **CAUTION!**

#### **Limited liability**

*mo-Vis accepts no liability for personal injury or damage to property that may arise from the failure of the user or other persons to follow the recommendations, warnings and instructions in this manual.*

**CAUTION!****EMC Requirements**

*The electronics of a power wheelchair and its options can be affected by external electromagnetic fields (for example from mobile telephones). Similarly, the electronics of the wheelchair or options themselves can also emit electromagnetic fields that can affect the immediate surroundings (for example certain alarm systems in businesses).*

*The limit values for Electromagnetic Compatibility (EMC) with respect to power wheelchairs are set in the harmonised standards for the EU in the Medical Devices Directive, No. 93/42/EEC. All-round Joystick Heavy Duty complies with these limit values.*

**WARNING!****Assembly**

*The All-round Joystick Heavy Duty should only be installed or adjusted by a qualified service engineer or someone with adequate knowledge to perform the adjustment in an expert manner.*

### **Maintenance and service**

*Carry out only the service and maintenance activities specified in this manual, as long as you comply with the demands stated in this manual for a specific action. All other service, alterations to and interventions on the product must be carried out by a qualified service engineer or someone with adequate knowledge to perform the adjustment in an expert manner. In case of doubt, contact a qualified service engineer or mo-Vis.*

*Use only spare parts or accessories approved or recommended by mo-Vis. All other use could lead to changes which might impair the function and safety of the product. It could also lead to the warranty becoming void.*



### **CAUTION!**

#### **Testing**

*The All-round Joystick Heavy Duty should always be tested without any person sitting in the wheelchair after every alteration of the physical installation or adjustment of the joystick parameters.*

# Design and function of the All-round Joystick Heavy Duty

## *Purpose*

The All-round Joystick Heavy Duty is a large format, extremely durable proportional joystick for all-round heavy duty use. It can serve as a hand or foot operated joystick and has been developed for users with excessive force (spasticity, dystonia, ...)

The All-round Joystick Heavy Duty is positioned at the top of our joystick series:

- **All-round Joystick Heavy Duty:** large size joystick, extreme force (ca. 650 gr – 22.93 oz)
- **All-round Joystick:** regular size joystick, regular force (ca. 250 gr – 8.81 oz)
- **All-round Joystick Light:** regular size joystick, medium force (ca. 120 gr – 4.23 oz)
- **Multi Joystick:** smaller size joystick, limited force (ca. 50 gr – 1.76 oz), operated with finger, chin, lip, ...
- **Micro Joystick:** very small sized joystick, minimal force (ca. 8 gr – 0.3 oz), operated with finger, chin, tongue, lip, ...

## ***Features***

The All-round Joystick Heavy Duty is:

- Fully proportional with increased throw and force (ca. 650 gr – 22.93 oz).
- Built in a compact housing, with two 3.5 mm jacks for switch input.
- Linkable with one or two switches (on/off = red jack socket and mode = yellow jack socket), with any 3.5 mm jack.
- Integrated interface. Different connection types available, depending on the version.
- Equipped with mini USB connection for configuration purposes.
- Fully adjustable to individual possibilities and needs with well-thought electronics.
- Easily configurable with the free mo-Vis Configuration software: positioning of the joystick. For other parameters, the wheelchair software settings are used.
- Compatible with multiple types of wheelchair electronics . See the connection manual for more information.

## ***Mounting***

The All-round Joystick Heavy Duty can be mounted at any location on the wheelchair.


- With the default double M6\*12 connection bolts.

- On any flat surface: with the optional Heavy Duty Mounting Ring Assembly (M002-28)
- You can equally use any other mounting system.

## Parts and accessories

### ***All-round Joystick Heavy Duty package***


An All-round Joystick Heavy Duty package consists of the following parts:

	Product description	Product code
	All-round Joystick Heavy Duty set, with integrated cabling and 2 M6*12 bolts	P002-73 (Omni) P002-77 (R-net) Or version for different connection
	All-round Joystick Heavy Duty manual	D-P002-73-70 D-P002-77-70
	Connection manual	D-P002-81-70 (Omni) D-P002-85-70 (R-net) Or version for different connection



## All-round Joystick Heavy Duty accessories

The following accessories are available:

	Product description	Product code
	Heavy Duty mounting ring assembly, for mounting the joystick in a flat surface	M002-28

## All-round Joystick Heavy Duty unit detail

The connections of the Joystick unit have protective covers to avoid the intrusion of dust or moist during usage.



### **CAUTION!**

*Before inserting a connector, remove the protective cover.*



### **CAUTION!**

*Always put or keep the protective cover in case the connections are not used.*



When in use, a green LED on the All-round Joystick Heavy Duty indicates the proper functioning of the unit. In case of an error, the LED flashes. Consult the Connection manual for more info.

### ***Ordering spare parts***

Spare parts and accessories must be ordered by the dealer at mo-Vis bvba.

Always mention Product code & Product description of items to be ordered.

## mo-Vis configurator software

The All-round Joystick Heavy Duty positioning is adjustable with the mo-Vis Configurator software.

## ***Software download***

- You can download the software on the mo-Vis website: [www.mo-vis.com](http://www.mo-vis.com).
- For all details on how to install and use the software, we advise you to consult the manual of the mo-Vis Configurator software (available in the support/download section of the mo-Vis website).

## ***Software requirements***

Windows version 7, 8 or 10.

## ***Profiles***

In the dealer level, you will be able to configure a number of parameters for the All-round Joystick Heavy Duty. The dealer profile requires a password.

## **Intended use**

The All-round Joystick Heavy Duty is a joystick module which can be connected directly to the wheelchair electronics to control the wheelchair functions.

## Safety precautions



### **CAUTION!**

*Protect the joystick against bumps.*



### **WARNING!**

*Avoid hitting obstacles during driving.*



### **WARNING!**

*Mind damaging the unit and wiring. Make sure that cabling is mounted in such a way that excessive wear and tear is avoided.*

## Functioning

The movements of the joystick are translated into according movements of the wheelchair, e.g. driving or menu navigation.

Common practice to navigate the wheelchair with the All-round Joystick Heavy Duty is as follows:

- **Direction:** point the joystick into the direction you want the wheelchair to move. The wheelchair then moves in that direction.
- **Speed:** the further you move the joystick from the default (center) position, the faster the wheelchair moves.
- **Stop:** whenever you release the joystick, the joystick moves back to the default (center) position and the wheelchair stops.

## Safe driving

It is mandatory to have a wheelchair power on/off switch – which immediately shuts down the wheelchair power and electronics – within easy reach of the user while driving. This allows to instantly stop the wheelchair in case of problems or an emergency.



### **WARNING!**

*The on/off switch must be available to the user at all times.*

In case the wheelchair responds in an unexpected way, the user must immediately release the joystick or use the power on/off switch.

## Connection options

You can connect one or two switches to the All-round Joystick Heavy Duty. One connection is to control the power (pwr) on and off, one connection is to control a mode (in).

The connection interface depends on the joystick version. Please refer to the connection manual for more information on the connectivity.

# Installation instructions

## Preparations

### ***Qualified service engineer***

Only a qualified service engineer may install the joystick.



#### ***WARNING!***

*An incorrect programming of the wheelchair electronics may cause damage to the devices, or injury to the user.*

### ***Tools***

Use an Allen wrench to install the joystick.



#### ***CAUTION!***

*Use the proper tools to install and adjust the joystick. The use of improper tools may cause damage to the device.*



#### ***CAUTION!***

*Do not tighten screws with an excessive force.*

### ***Installation plan***

Set up an installation plan before starting the installation. Based on the users' needs and capabilities of the wheelchair and user, this plan should take into account:

- Where the Joystick should be placed.
- How the Joystick will be operated: hand, foot,.....
- A robust and reliable positioning. Hard or sudden movements of the wheelchair may not disorganise the installation.

**CAUTION!**

*Protect the joystick against bumps*

**WARNING!**

*Mind damaging the unit and wiring. Make sure that cabling is mounted in such a way that excessive wear and tear is avoided.*

**CAUTION!**

*Any connection must always be secured with all delivered screws. Only use the screws provided in the package.*

**WARNING!**

*Do not use the screw holes at the bottom of the unit to mount or secure the unit. These are not intended for heavy duty use and are thus covered.*

### ***Serial number sticker***

The additional serial number sticker which can be found in the package should be adhered to the back of this manual.

## Joystick table mount

When mounting the All-round Joystick Heavy Duty in a flat surface (e.g. a tray or table top) use the Heavy Duty Mounting Ring (Product code: M002-28) to secure the joystick directly to the surface.



### **CAUTION!**

*Tighten the bolts firmly, but not excessively. Excessive force may damage the unit.*

## Changing joystick tip

If required, the Joystick tip may be replaced by a custom tip (e.g. a 'T')

- To remove the default joystick tip, open the rubber cover below the joystick from the bottom towards the top and use an M12x1.5 wrench to unscrew the tip.
- Replacing the joystick tip is done at own risk.
- Contact your dealer or mo-Vis for more information. Custom tips may be available.



## All-round Joystick Heavy Duty installation

1. Mount the unit with the two included M6\*12 bolts at the desired location.
  - Do not mount the unit using the screw holes at the bottom of the unit.
  - When using the Mounting Ring Assembly to install the unit in a flat surface: first attach the mounting ring to the unit with the bolts included with the ring, then secure the ring to the flat surface. The mounting ring should always be located at the bottom side of the flat surface..
  - Contact your dealer or mo-Vis for more information.
2. Place and secure all cabling on the wheelchair.



### **WARNING!**

*Mind damaging the unit and wiring. Make sure that cabling is mounted in such a way that excessive wear and tear is avoided.*

3. If required, place a power on/off (pwr) and/or mode (in) switch, secure their cabling and insert their connections.



### **CAUTION!**

*Before inserting a connector, remove the protective cover.*



### **CAUTION!**

*Always put or keep the protective cover in case the connections are not used.*

#### 4. Connect the cabling to the wheelchair electronics



##### **WARNING!**

*All wheelchair electronics must be switched off during installation.*

## Defining position (parameters)

If the All-round Joystick Heavy Duty is not mounted with the USB connection pointing towards the user, you can adjust the joystick direction in steps of 90° with the mo-Vis Configurator software.

- This software must be installed and ready to use on a pc.
- In the dealer level, you will be able to change a number of parameter settings.
- To define the movements during the installation procedure, we advise having at least a dealer profile.

### ***Defining parameter settings***

To define the parameter settings, proceed as follows:

1. Connect the All-round Joystick Heavy Duty to a pc. Use a standard mini-USB – USB cable.
2. Configure the parameters with the software.
3. Upload the configuration.
4. Test the configuration and adjust if necessary.

## ***Parameter settings***

Please see “Parameter Settings” for a list of all parameter settings.

## Testing

After installation of the All-round Joystick Heavy Duty, execute the following tests before the wheelchair is delivered to the user or put into service, in according order:

1. Check the joystick for intactness
2. Operational test
3. Test drive
4. Stop test

### ***Check the joystick for intactness***

Check whether:

- The joystick is not bent or damaged
- Housing, cabling and all connectors are not damaged
- The joystick returns to its default position when moving and releasing the joystick forward, backward, left and right.

## Operational test



### **WARNING!**

*Execute this test only on a level surface, with at least one meter of free space around the wheelchair.*

1. Activate the wheelchair operating system.
2. The green LED on the joystick must be on.  
If the LED flashes, an error is detected. Do not proceed before resolving the error.
3. Move the joystick slowly forward until you hear the parking breaks switch off.



### **CAUTION!**

*The wheelchair may start moving.*

4. Immediately release the joystick. You should hear the parking break react within a few seconds.
5. Repeat steps 3 and 4 three times, while slowly moving the joystick towards you, to the left and to the right.
6. Check whether the power on/off and mode Switch function properly.

## Test drive

Make a test drive with the wheelchair.

- Check whether the wheelchair and all its functionalities function fully correctly in all positions the user may use the joystick and switches.
- Check no cabling or parts may get damaged or hindered in any possible position of the wheelchair.

### ***Stop test***

Drive full speed ahead and shut down the wheelchair with the power on/off switch.

The wheelchair may not suddenly stop, but must slow down to a gradual stop.

### *Dealer assistance*

During first time use by the user it is advised that the dealer or service engineer assists and explains the different possibilities to the customer (the user and/or his attendant).

If needed, the dealer can make final adjustments.

### *User testing*

It is important that the customer is fully aware of the installation, how to use it and what can be adjusted to optimise his experience.

As a dealer, proceed as follows:

1. Explain and show the customer how you have executed the installation, and explain the function of every (new) button.
2. Have the user test all positions of the joystick:
  - Are the joystick and switches within easy reach?
  - Can the user safely operate the wheelchair with the least effort?
  - Is the placement of the joystick and buttons in all available positions optimal for the user?
3. If needed, adjust the joystick.
4. Explain to the customer possible problems and how to address them.

# Using the All-round Joystick Heavy Duty

## Conditions of use

The All-round Joystick Heavy Duty is intended for use as installed by the dealer, in accordance to the installation instructions in this manual.

The foreseen conditions of use are communicated by the dealer or service engineer to the user and/or attendant during the first time use.

If the conditions of use change significantly, please contact your dealer or a qualified service engineer to avoid excessive wear and tear or unintended damage.

## Error codes

When a fault occurs, the LED of the All-round Joystick Heavy Duty will start to flash. A long delay is followed by a number of flashes with a short delay.

The error message depends on the connection type. Count the number of flashes and look up the according error message in the Connection manual.

# Maintenance

## *Cleaning*

Clean all parts of the All-round Joystick Heavy Duty on a regular basis (monthly), or whenever needed.

- Gently remove dust and dirt with a damp cloth
- Use only non-aggressive disinfectant cleaning agents



### ***WARNING!***

*Do not immerse in water or use excessive amounts of liquid.*



### ***CAUTION!***

*Do not apply additional lubricants to the moving parts.*

## *Monthly check*

Monthly, or whenever needed, check whether:

- All bolts and screws are still firmly tightened
- There is no damage to any wiring
- There is no excessive wear to any of the parts

## *Yearly check*

We advise to have at least yearly a full check of the wheelchair and its operating systems by a qualified service engineer.

Contact your local dealer or mo-Vis for more information.



## *Maintenance free*

The All-round Joystick Heavy Duty is maintenance-free. Under regular use circumstances, the joystick with integrated interface unit and its different parts do not require additional maintenance.

## Parameter settings

With the mo-Vis Configurator Software you can change the parameters of the All-round Joystick Heavy Duty. In the dealer level, you will be able to change a number of parameters.

## Mounting Settings

Setting	Description	Parameters	
Mounting direction	Sometimes it is easier to mechanically mount the joystick under an angle. This function swaps the joystick axis per 90 degrees clockwise. This parameter allows to compensate for the rotation of the joystick.	Default	0°
		Min.	0°
		Max.	270°
		Steps	90°

## Deadband

Setting	Description	Parameters	
Deadband	Neutral zone around the joystick center position. Prevents creeping of the wheelchair after releasing the joystick.	Default	5%
		Min.	5%
		Max.	10%

**Note:** Most wheelchair electronics have their own deadband setting. It is advised to keep the default setting.

## Compensation

Setting	Description	Parameters	
Compensation factor	Lowers forward/backward (Y) driving speed on rough terrain. Wheelchair type and weight have an impact on this factor. <ul style="list-style-type: none"><li>— Heavy loaded wheelchairs may need to lower their default setting to Weak.</li><li>— Light wheelchairs may need to increase the default setting to Strong.</li></ul>	Very weak	almost no slow down
		Weak	slows down less compared to Normal
		Normal	<b>Default setting</b>
		Strong	slows down more compared to Normal

Setting	Description	Parameters	
	<ul style="list-style-type: none"> <li>— If the joystick is mounted on a location that may multiply the value of a shock (e.g. on an arm), the default setting should be lowered to Weak or Very weak.</li> <li>— Front wheel-driven wheelchairs are less affected by this factor than back wheel-driven wheelchairs.</li> </ul>	Very strong	slows down more compared to Strong
X compensation	<p>To limit the steering reaction if the wheelchair overreacts on steering commands. This may happen due to compensation on the X direction that unables the wheelchair to overcome an obstacle due to the loss of torque.</p> <p>The value is based on the compensation in Y direction.</p>	None	<b>No compensation</b>
		1/2 Y	X = 50% of Y level
		2/3 Y	X = 66% of Y level
		Equal Y	X = 100% of Y level
(de)activation pattern	<p>Active if compensation mode is set to Manual.</p> <p>To activate / deactivate: nudge the joystick Forward + Backward + Forward.</p>	Fast	fast executing speed
		Normal	<b>normal executing speed</b>

Setting	Description	Parameters	
	<ul style="list-style-type: none"><li>— Agile users may be able to execute this pattern quite quickly.</li><li>— Set this parameter according to the agility of the user.</li><li>— <b>Caution:</b> "Slow" may cause the wheelchair to drive while executing the pattern.</li></ul>	Slow	slow executing speed

## Tilt

Setting	Description	Parameters
Enable	<p>The joystick can detect the joystick tilt referenced to the earth's gravitation.</p> <p>The wheelchair will stop driving when the parameter 'Enable' is set 'On' and the joystick is tilted more than 70 degrees, this in any direction. The Tilt sensor inhibit becomes inactive again - which means that the joystick is active again - if the angle becomes less than 60 degrees.</p> <p>The use of this functionality certainly makes sense when a mo-Vis joystick is integrated in a tray or other tilting surface / mounting aid.</p> <p>The default setting of the Tilt sensor is 'off'.</p> <p><b>Important:</b> the Tilt sensor response time is less or equal to 1s.</p>	

## Compensation mode

Setting	Description	Parameters	
Compensation mode	Defines activation of the compensation algorithm.  For R-net: can be set individually for each profile.	Off	always deactivated
		Manual	(de)activated manually by the user
		On	always activated

### ***Product description & Code***

- All-round Joystick Omni Heavy Duty (P002-73)
- All-round Joystick R-net Heavy Duty (P002-77)
- Or version for different wheelchair electronics connection

### ***Joystick connectors***

- 3.5 mm mono jack in on/off
- 3.5 mm mono jack in mode
- Mini USB
- Wheelchair connector, depending on the joystick version  
Refer to the connection manual for more information.

### ***Dimensions***

- 175 x 86 x 86 mm / 6.89 x 3.38 x 3.38 in (HxWxD)

### ***Required Force***

- ca. 650 gr (22.93 oz)

Installation date: . . / . . / . . . . .



Dealer: . . . . .

***Dealer stamp:***

A large, empty rectangular box with a thin green border, intended for a dealer stamp.

***Serial number sticker***

A large, empty rectangular box with a thin green border, intended for a serial number sticker.