mo·vis
move with vision

Multi Swing

Versatile powered mounting device

Multi Swing Right Arm(P001-60)

Multi Swing Right Arm Bundle (P001-62)

Multi Swing Left Arm (P001-61)

Multi Swing Left Arm Bundle (P001-63)

Contact & Product

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Multi Swing User & Installation manual

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Contents

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.

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 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.

Ordering documentation

You can download additional copies of this User & Installation manual on the mo-Vis website: 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 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.

mo-Vis bvba warrants the Multi Swing to be free from defects in material and workmanship for a period of 2 years under proper use, care and 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 Multi Swing motor unit 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 Multi Swing is intended to be fitted on any power wheelchair 24 V connection.

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, you should carefully read this instruction manual, 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 Multi Swing motor unit is 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.
Multi Swing complies with these limit values.

⚠️

WARNING!

Assembly

The Multi Swing 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 Multi Swing 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 Multi Swing should always be tested without any person sitting in the wheelchair after every alteration to the physical swing or adjustment of the motor parameters.*
>
> *Make sure that no part, cables or options of the wheelchair or a person may get blocked by the movements of the swing.*

Design and function of the Multi Swing

Purpose

The Multi Swing is a versatile, motorised arm to mount on a powered wheelchair. With this arm, devices such as a chin joystick can be positioned to drive, and the arm can be moved upwards or sideways by pressing a button whenever needed.

General

The Multi Swing is attached to the rear of the wheelchair's backrest with the Q2M Universal Clamp (included in the Bundle version). The Q2M Universal Clamp is also available as a separate product.

- With the different included installation parts, the Multi Swing motor unit and arm can be optimally positioned for each individual user.
- With the mo-Vis Configurator software, the device's movements, speeds and activation methods can be altered for every situation.
- The Multi Swing works with any button with mini jack connection (stereo or mono). The jack connections of the input and output are configurable via a computer, e.g. one input button can be configured to perform up to three different functions.

Parts and accessories

Available versions

- **Multi Swing Right Arm** (P001-60): for installation at the right side of the wheelchair)
- **Multi Swing Right Arm Bundle** (P001-62): for installation at the right side of the wheelchair, incl. mo-Vis Multi Swing Mounting Set
- **Multi Swing Left Arm** (P001-61): for installation at the left side of the wheelchair)
- **Multi Swing Left Arm Bundle** (P001-63): for installation at the left side of the wheelchair, incl. mo-Vis Multi Swing Mounting Set

Multi Swing Package

A Multi Swing package consists of the following parts:

	Product description	Product code
	Multi Swing motor unit	P001-50
	Multi Swing T-connection	M001-12
	Multi Swing T-bar Rod	M001-05
	Multi Swing arm to rod Interconnection Assembly	M001-13
	Multi Swing Right arm (for packages P001-60 and P001-62)	M001-01
	Swing Left arm (for packages P001-61 and P001-63)	M001-10

	Product description	Product code
	Multi Swing C-rod	M001-02
	Multi Swing S-rod	M001-03
	Multi Swing pulling wire	M001-14
	Multi Swing end stop	M001-15
	Multi Swing manual, with Serial number sticker	D-P001-50-70

Multi Swing Mounting Set

The Multi Swing Mounting Set (M001-70) is included in the Bundle version P001-62 and P001-63

The Multi Swing Mounting Set or its different parts can also be ordered separately.

	Product description	Product code
	Q2M Universal Clamp	M007-01
	Q2M Multi Swing Bracket (incl. mounting screws)	M004-10
	Q2M Dogbone Slide In (200 mm)	M004-11

	Product description	Product code
	Q2M Q2M Dogbone Extension Straight (incl. mounting screws)	M004-12
	Q2M Q2M Dogbone Extension Right Angled (incl. mounting screws)	M004-13

Complete installation

Below, you see a picture of a completely installed Multi Swing arm, with a Multi Swing Mounting Set.

Multi Swing motor unit detail

The connections of the Multi Swing motor unit have protective inserts 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.

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.

The Multi Swing movement, speed, angle and connection are fully adjustable with the mo-Vis Configurator software.

Software download

- You can download the software on the mo-Vis website: 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 (included in the software download).

Software requirements

Windows version 7, 8 or 10.

User profiles

Depending on your profile (user, attendant, dealer, OEM), you will be able to configure a number of parameters for the Multi Swing.

- For a user profile, no password is required.
- Attendant, Dealer and OEM profiles require a password.

The different parts of the Multi Swing can be installed in different ways, allowing a flexible placement for any user.

Left or right installation

The Multi Swing is available in a right and left version. The default position is right, so for the left version you will need to adjust the mounting location parameter in the configurator software (see further).

- For installation at the right side of the wheelchair: use the Multi Swing Right Arm (P001-60) or Multi Swing Right Arm Bundle (P001-62).
- For installation at the left side of the wheelchair: use the Multi Swing Left Arm (P001-61) or Multi Swing Left Arm Bundle (P001-63).

Default Multi Swing motor unit placement

By default, the Multi Swing is placed for a sideways movement of the arm.

By tilting the Multi Swing motor unit leaving out the Q2M Dogbone Extension Right Angled, the Multi Swing arm can be mounted for an upward movement.

Use the different dog bones to place the Multi Swing motor unit at the correct position for the user.

Multi Swing Arm positioning

The T-connection is used to connect the Multi Swing arm to the Multi Swing motor unit. To attach the device to the Multi Swing arm, use either the S-rod or C-rod.

Connection options

The Multi Swing is operated by any type of button, and can be configured in multiple ways.

The input and the output jack are stereo types, allowing dual channel use. You can thus connect two buttons (input jack), or trigger two outputs (output jack).

To use both channels, a splitter cable is needed (see illustration).

⚠️ **CAUTION!**

When inserting a mono jack into the input, make sure that no functionality has been programmed for the second input (e.g. if initially two buttons have been programmed and then a mono jack button would be used, a continuous signal will still be sent if the second function was not cleared beforehand)

Operation options

There are three operation modes and they can be triggered from both input channels.

You can configure the operation modes with the mo-Vis Configurator software.

- Normal operation mode
  - One action per channel: operate the arm or trigger an output.
- Combined double action, 2 actions per channel
  To activate: set the 'Output Mode Tip' to 'Output Timed'
  - Press short: trigger the Output Tip
  - Press long: operate the arm.
- Combined triple action, 3 actions per channel
  To activate: set the 'Output Mode Tip' to 'Output Timed'
  - Press shortly once (single click): trigger the Output Tip
  - Press shortly twice (double click): trigger the Output Ring
  - Press long: operate the arm

Drive safety

With the mo-Vis Configurator software, you can set an output to be triggered when the arm is in home position.

⚠️ **CAUTION!**

When the Multi Swing is in sleep mode and the arm is moved manually – although it is not advised – it can take 5 to 10 seconds before the output will react to the new positioning of the arm.

Installation instructions

Preparations

Qualified service engineer

Only a qualified service engineer may install the Multi Swing.

Tools

Use an Allen wrench to install the Multi Swing Mounting Set and Multi Swing.

⚠️
> **CAUTION!**
> *Use the proper tools to install and adjust the Multi Swing. 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 with actual measurements of the wheelchair and the user, this plan should specify:

- Where which part of the Multi Swing should be placed
- How the Multi Swing will be operated
- The Multi Swing motor unit parameter settings

Serial number sticker

The additional serial number sticker (included in the package) has to be adhered to the back of this manual.

> ⚠️ **CAUTION!**
> *Any connection must always be secured with supplied screws.*

To install the Multi Swing motor unit, proceed as follows – according to your installation plan:

1. Place the Q2M Universal Clamp left or right on the wheelchair and secure it firmly.
2. Place and secure the Q2M Dogbone Slide In in the Universal Clamp.
3. Place and secure the Q2M Dogbone Extension Right Angled on the Q2M Dogbone Slide In.
   – Do not mount the Q2M Dogbone Extension Right Angled if the arm must be able to move upwards. We advise to use at least one Q2M Dogbone Extension Straight instead.
   – If the user is hindered by the upward swing, mount the Multi Swing motor unit at higher position.
   – Other configurations can be made, depending on the placement.
   – If needed, additional mounting parts can be ordered at mo-Vis.
4. Place and secure the Multi Swing motor unit and the Multi Swing Bracket.

> ⚠️ **CAUTION!**
> *The connections must be at the bottom (default position) or at the lower part (tilted position).*

5. Lead the XLR power cable to a fused connection (max. 12 A) on the wheelchair battery and secure the XLR power cable to the wheelchair with straps or fasteners.

> ⚠️ **WARNING!**
> *Do not connect the XLR power cable to the wheelchair battery or another battery source while installing or adjusting the Multi Swing motor unit or Multi Swing arm to avoid any unwanted movement.*

Installation of the arm

Make sure the Multi Swing motor unit is properly installed, before starting installation of the Multi Swing arm.

⚠

> **CAUTION!**
>
> *Do not manually change the angle of the Multi Swing arm or T-connection when attached to the Multi Swing motor unit. This may harm the positioning and functioning of the Multi Swing motor unit.*

⚠

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

To install the arm, proceed as follows – according to your installation plan:

1. Attach the T-connection to the Multi Swing motor unit.
2. Insert the Multi Swing arm into the T-connection.

⚠

> **CAUTION!**
>
> *The dog-tip screws should fit into the slots of the arm. Select the appropriate screw location in the T-connection. Screws should be placed in such a way that they do not enter the cable throughputs in the arm.*

3. Place the C-rod or S-rod for attaching the device.
4. If needed, cut off excessive piping at the back of the arm (behind the T-connection).
   Remember to keep a small excess of piping in order to be able to make readjustments.

⚠

> **CAUTION!**
>
> *When cutting off piping, always deburr the cut-off end to avoid injury or cable damage.*

5. Use the pulling wire to insert the connection cable for the device into the arm. (Only applicable for mo-Vis Micro and Multi Joystick.)
   The connection cable enters at the C-rod or S-rod and leaves the arm just past the T-connection.
6. Place the device on the C-rod or S-rod and secure it firmly.

⚠

> **CAUTION!**
>
> *The maximum device weight is 500 gr at a distance of 65 cm from the pivot point at the Multi Swing motor unit connection.*

7. Attach and secure all cables.
8. Mount the end stop.

Testing

After installation of the Multi Swing motor unit and the Multi Swing arm, test the positioning and movements of the arm.

⚠️ **WARNING!**
First test without any person sitting in the wheelchair.

⚠️ **CAUTION!**
Always use a fused connection of max. 12 A on the wheelchair battery.

1. Connect the Multi Swing motor unit to the wheelchair battery with the XLR cable.
2. Connect a button to the Multi Swing Multi Swing motor unit steering input.
3. Power up the wheelchair.
4. Push the button.
   Default Multi Swing motor unit parameter settings are: open/close arm, Momentary (arm moves as long as the button is pressed, pressing again changes the direction of the movement).
5. Check the following items:
   – Is the arm moving in accordance with the default settings?
   – Can the arm move freely without hindering any wheelchair item or cable?
   – Can the arm move without hindering a person in the wheelchair?
   – Can all cables move freely while being securely attached?
6. If needed, adjust the positioning of the arm and Multi Swing motor unit and retest until optimal and secure functioning.

⚠️ **WARNING!**
Switch off the wheelchair and disconnect the Multi Swing motor unit from the power source to avoid any unwanted movement.

7. Check that all screws are firmly secured.

The Multi Swing movement, speed, angle and connection are fully adjustable with the mo-Vis Configurator software.

- This software must be installed and is ready to use on a pc.
- Depending on your user profile (user, attendant, dealer, OEM), you will be able to change a number of parameter settings.

  To define the movements during the installation procedure, we advise to have at least a dealer profile.

Defining parameter settings

To define the parameter settings, proceed as follows:

1. Connect the Multi Swing motor unit 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 refer to Parameter settings for a list of all parameter settings.

First time use

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 Multi Swing motor unit and arm:
   - Is the arm moving in accordance with the settings?
   - Can the arm move freely without hindering the person in the wheelchair?
   - Is the placement of the arm and buttons in all available positions optimal for the user?
3. If needed, adjust the Multi Swing and retest till optimal position and functioning.
4. Explain to the customer possible problems and how to address them (see "Troubleshooting").

Using the Multi Swing

Conditions of use

The Multi Swing 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.

User adjustments

⚠	**WARNING!**
	Changes in parameter settings may cause damage to devices or the wheelchair, or may cause injuries to persons.
⚠	**CAUTION!**
	Only change parameters without any person sitting in the wheelchair
⚠	**CAUTION!**
	Only test new settings without any person sitting in the wheelchair

As a user or attendant, you can make a limited number of parameter adjustments yourself with the mo-Vis Configurator software.

Although the number of parameters you can change as a user or attendant is limited, we advise changing only parameters you completely understand.

- For a list of parameter settings, see Parameter settings.

Troubleshooting

Below is a list of possible problems and their probable cause & remedy.

Problem	Possible cause	Remedy
arm does not move	No power	– Check whether all power cables are still attached – Check battery level
	– Bad or wrong connection of the button – Faulty button or wiring	– Check whether the button cable is still firmly attached to the correct terminal – Connect a different button – Change the wiring
	The mounted device is too heavy	Dismount the device
arm keeps moving	– Bad connection of the button – Faulty button or wiring	– Disconnect and reconnect the button – Disconnect and reconnect the power supply cable – Connect a different button – Change the wiring
arm does not move the complete foreseen trajectory	arm movement is hindered	Free the trajectory of the arm
	The mounted device is too heavy	Dismount the device
	Wrong parameter settings	Change the settings

If the problem persists after intervening, please contact your local dealer or mo-Vis Service Engineer to attend to the problem.

Error codes

Fault	Reason	Required action
CPU Error RAM	CPU consistency check failed.	Replace PCB
CPU Error FLASH	CPU consistency check failed.	Replace PCB
CPU Error EEPROM	CPU consistency check failed.	Replace PCB
Run Error Scheduler	Firmware consistency check failed.	Update Software or Replace PCB
Code Error Framework	Firmware consistency check failed.	Update Software or Replace PCB
Code Error Application	Firmware consistency check failed.	Update Software or Replace PCB
MSP Command Corrupt	Corrupt command was received.	Connection with the PC (Configurator program) went wrong, try again.
MSP Command Unknown	Unknown command was received.	Connection with the PC (Configurator program) went wrong. Update Firmware or update Configurator Software. Try again.
MSP Sub Command Unknown	Unknown Sub Command was received.	Connection with the PC (Configurator program) went wrong. Update Firmware or update Configurator Software. Try again.
MSP Argument Invalid	Invalid argument received.	Connection with the PC (Configurator program) went wrong. Update Firmware or update Configurator Software. Try again.
MSP Device Not Ready	Device as not ready to receive an MSP command.	Connection with the PC (Configurator program) went wrong. Update Firmware or update Configurator Software. Try again.
MSP Device Wrong State	The device is not able to receive a command in the current device state.	Connection with the PC (Configurator program) went wrong. Update Firmware or update Configurator Software. Try again.
PCB Test Failed	Factory test failed.	A fault occurred during factory testing.
Assembly Test Failed	Factory test failed.	A fault occurred during factory testing.
Field Test Failed	Field test failed (Calibration).	A fault occurred during field testing (Calibration).
Test Flag Check	One or more test flags not set.	Redo tests and/or replace PCB.
Driver Error	The PWM driver signals a problem.	Check motor and mechanics. Replace PCB.
Motor Stalled	Motor is not moving while it should be moving.	Check motor, potentiometer and mechanics and/or replace PCB.

Maintenance

Cleaning

Clean all parts of the Multi Swing 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 the Multi Swing motor unit in water or do not use excessive amounts of liquid.*

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

Multi Swing motor unit maintenance

The Multi Swing is maintenance-free. Under regular use circumstances, the Multi Swing motor unit and different parts do not require additional maintenance.

> ⚠️ **CAUTION!**
> *Do not apply additional lubricants to the moving parts of the Multi Swing motor unit.*

Parameter settings

With the mo-Vis Configurator Software you can change the parameters of the Multi Swing. Depending on your user profile (user, attendant, dealer, OEM), you will be able to change a number of parameters.

Mounting Settings (User Level)

Setting	Description	Parameters	
Open angle	– The opening angle of the arm. – Automatic stop of the movement when the angle is reached.	Default	**180°**
		Min.	1°
		Max.	274°
		Steps	1
Mounting location	– Right mount – Left mount	– **Right** (default) – Left	
Mounting direction	– Horizontal mount: arm moves left/right. – Vertical mount: arm moves up/down.	– **Horizontal** (default) – Vertical	

Normal operation

In this case the button will cause a direct action. The action could move the arm or operate an output.

Combined double action

In this case the button is used to control both an output and move the arm.

When the button is closed shortly the Output Tip will be closed for a fixed settable time (see settings).

Pressing the button longer will operate the arm. Depending on the settings the arm will move as long as the button is pressed or move all the way till the end.

Combined triple action

In this case the button is used to control both outputs and move the arm.

When the button is pressed shortly once (single click) the 'Output Tip' will be closed for a fixed settable time (see settings).

When the button is pressed shortly twice (double click) the 'Output Ring' will be closed for a fixed settable time (see settings).

Pressing the button longer will operate the arm. Depending on the settings the arm will move as long as the button is pressed or move all the way till the end.

Do not forget to set both the 'Output Mode Tip' and 'Output Mode Ring' to 'Output Timed'. Otherwise the output(s) will not be functional. This is to avoid that outputs used for drive safety would lose their function.

Jack Tip Action

Use this action when a button is connected to the tip of the input jack (this is the case when no splitter is used) and a mono jack or standard button with mono jack.

Parameter	Setting
Combined Double Action	Two actions are executed with the same button.
Combined Triple Action	Three actions are executed with the same button.
Open/Close arm (default)	Open/Close arm, the direction will alternate.
Open arm	Open the arm.
Close arm	Close the arm.
Operate Output Tip	Actuate the tip of the output jack.
Operate Output Ring	Actuate the ring of the output jack.
No Action	Nothing will happen.

Jack Ring Action

Use this action when a button is connected to the ring of the input jack (use a splitter cable to access the ring of the jack)

Parameter	Setting
Combined Double Action	Two actions are executed with the same button.
Combined Triple Action	Three actions are executed with the same button.
Open/Close arm	Open/Close arm, the direction will alternate.
Open arm	Open the arm.
Close arm	Close the arm.
Operate Output Tip	Actuate the tip of the output jack.
Operate Output Ring	Actuate the ring of the output jack.
No Action (default)	Nothing will happen.

Motor Mode

Parameter	Setting
Move arm Momentary (default)	The arm moves as long as the button is pressed.

Parameter	Setting
Move arm to End	The arm moves towards the end even after the button has been released. Pushing the button again will stop the arm.

Output Tip Mode

Parameter	Setting
Output Momentary	The output is closed as long as the button is pressed.
Output Timed (default)	The output is closed for a set time (see 'Output Close Time').
Output Switched	– The output acts as a switch. – Press the button to open/close. – This is also called toggle mode.
Output Drive Close	The output is closed when driving is allowed (related to home angle parameter).
Output Drive Open	The output is open when driving is allowed.
Output Close	The output is always closed.
Output Open	The output is always open.

Output Ring Mode

Parameter	Setting
Output Momentary	The output is closed as long as the button is pressed.
Output Timed (default)	The output is closed for a set time (see 'Output Close Time')
Output Switched	– The output acts as a switch. – Press the button to open/close. – This is also called toggle mode.
Output Drive Close	The output is closed when driving is allowed.
Output Drive Open	The output is open when driving is allowed.
Output Close	The output is always closed.
Output Open	The output is always open.

Setting	Description	Parameters	
Jack Input Debounce Time	– Debounce time is the time the button needs to be pressed continuously before an action will occur. – Use this action to avoid multiple actions in cases such as tremor.	Default	**50 ms**
		Min.	10 ms
		Max.	2 500 ms
		Steps	10
Jack Input Action Delay	– Only in combination with Combined Double/Triple Action. – Sets the delay time. The button must be pressed (once or twice depending on the input mode) to trigger. – Pressing the button longer will operate the arm.	Default	**500 ms**
		Min.	100 ms
		Max.	5 000 ms
		Steps	10
Output Close Time	– The time the output will be closed if 'Output Timed' is set for an output.	Default	**200 ms**
		Min.	20 ms
		Max.	5 000 ms
		Steps	10
Home Angle	– When the arm is near the home position (mechanical end-stop): To set an output to indicate the position of the arm. – Used, for instance, to inhibit driving when the arm is not in drive position. – See also 'Output Tip Mode' and 'Output Ring Mode'.	Default	**5°**
		Min.	5°
		Max.	30°
		Steps	1

Motor Settings (Dealer Level)

⚠	**CAUTION!**
	Due to product optimisations, the default setting values stated below may deviate.

Setting	Description	Parameters	
Nominal Speed of the arm	– To set the nominal speed. – Increase this value only for light loads. – Increasing this speed may cause the current limit to be reached too soon.	Default	**80 %**
		Min.	60 %
		Max.	100 %
		Steps	1
Start speed of the arm	– To set the start/end speed. – Decrease this value only for light loads. – Decreasing this speed may cause the current limit to be reached at the start.	Default	**45 %**
		Min.	30 %
		Max.	50 %
		Steps	1
Acceleration sector	– Determines how far the arm needs to move to go from min to max speed or vice versa. – The smaller the angle, the higher the acceleration/ deceleration will be. – Decrease this value only for light loads.	Default	**15°**
		Min.	10°
		Max.	50°
		Steps	1
Current at Nominal Speed	– Motor current limit at nominal speed. – Increasing this value too much may cause the slip coupling to be actuated.	Default	**500 mA**
		Min.	100 mA
		Max.	3 500 mA
		Steps	5
Current at Start Speed	– Motor current limit at start. – Increasing this value too much may cause the slip coupling to be actuated unnecessarily.	Default	**375 mA**
		Min.	50 mA
		Max.	2 500 mA
		Steps	5

Setting	Description	Parameters	
Current at End Stop	– Motor current limit when reaching the end stop. – Increasing this value too much may cause the slip coupling to be actuated unnecessarily.	Default	**140 mA**
		Min.	50 mA
		Max.	2 500 mA
		Steps	5

Hardware Settings (OEM Level)

⚠	**CAUTION!**
	Due to product optimisations, the default setting values stated below may deviate.

Setting	Description	Parameters	
Motor Voltage	– The voltage of the motor used in the design.	Default	**12 000 mV**
		Min.	5 000 mV
		Max.	24 000 mV
		Steps	100
Voltage/ Current Comp	– Use this setting to adjust the motor and PWM driver. – The device will try to keep the speed of the motor constant, independent of the supply voltage. This also depends on the motor and PWM driver adjustment.	Default	**120**
		Min.	50
		Max.	200
		Steps	1
PWM Offset	– The PWM driver has a rise/fall time. The PWM cycle needs to be increased to compensate for this effect. – This value depends on the driver used and should not be changed for a certain hardware design.	Default	**10**
		Min.	0
		Max.	25
		Steps	1
Power Factor	– Use this setting to increase the power to the motor to compensate a speed drop. – When the current consumption of the motor increases, the motor speed will slightly drop. – Do not set this value too high. The speed is not meant to be kept perfectly constant. A value too high might cause oscillations or the current limit could be reached too soon.	Default	**10**
		Min.	0
		Max.	50
		Steps	1

Setting	Description	Parameters	
Inrush Time	– Use this setting to allow an increased current (in ms) during the inrush moment to avoid the current limit to be activated. – When the motor starts, an elevated current is used during a short time: the inrush current.	Default	**150 ms**
		Min.	100 ms
		Max.	1 000 ms
		Steps	10
Inrush Over Current	– Use this setting to allow an increased current (in %) during the inrush moment to avoid the current limit to be activated. – When the motor starts, an elevated current is used during a short time: the inrush current.	Default	**150 %**
		Min.	100 %
		Max.	250 %
		Steps	10
Stall time	– When the main axil is not moving during the set time, the electronics will assume the motor stalled and power to the motor will be stopped.	Default	**5 000 ms**
		Min.	100 ms
		Max.	10 000 ms
		Steps	100
Stall Angle	When the main axil has moved more than the set angle, the stall counter is reset.	Default	**1°**
		Min.	1°
		Max.	10°
		Steps	1
Switch Input Debounce Time	Debounce time is the time the switch needs be closed continuously before an end stop is detected. This can be used to compensate for switch vibrations when the hardware is equipped with end-switches.	Default	**50 ms**
		Min.	10 ms
		Max.	2 500 ms
		Steps	10

Technical data

Product description & code

- Multi Swing Right Arm(P001-60)
- Multi Swing Right Arm Bundle (P001-62)
- Multi Swing Left Arm (P001-61)
- Multi Swing Left Arm Bundle (P001-63)

Interface connectors

- 3.5 mm stereo jack in
- 3.5 mm stereo jack out
- Mini USB

Maximum torque arm

3,25 Nm (500 gr load at 65 cm from pivoting point)

Sleep mode timer

120 s

Voltage supply

16 V to 26 V

Output drive safety update time

(In sleep mode) 5 s

Power consumption

- Sleep mode: 1,56 mA
- Active mode, with inactive motor: 5,2 mA
- Active mode, with active motor: up to 1 000 mA

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

Dealer: . . . .

Dealer stamp:

Serial number sticker