Micro Joystick

Owner's Manual
mo-Vis Micro Joystick for R-Net

∩o-vis
moving forward together

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Stealth Products is committed to 100% customer satisfaction. Your complete satisfaction is important. Please contact us with feedback or to suggest changes that may help us improve the quality and usability of our products.

You may reach us at:

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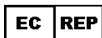
EC REP   MDSS GmbH   CE
Schiffgraben 41
30175 Hannover, Germany

General   1.1

Read and understand all instructions prior to the use of this product. Failure to adhere to instructions and warnings in this document may result in property damage, injury, or death. Product misuse due to failure to adhere to the following instructions will void the warranty.

Immediately discontinue use if any function is compromised, if parts are missing or loose, or if any component shows signs of excessive wear. Consult your supplier for repairs, adjustments, or replacements.

Important Information 2.1

All persons responsible for fitting, adjustment, and daily use of the devices discussed in these instructions must be familiar with and understand all safety aspects of the devices mentioned. In order for our products to be used successfully, you must:

- read and understand all instructions and warnings;
- maintain our products according to our instructions on care and maintenance; and,
- ensure devices are installed and adjusted by a trained technician.

Disposal 2.2

For scrapping, please adhere to your local waste legislation. Dispose of obsolete electronic parts responsibly and in accordance with local recycling regulations.

Supplier Reference 2.3

Supplier:

Telephone:

Address:

Purchase Date:

Model:

The installation instructions will guide you through the options and possibilities with the product. The **Micro Joystick** should be adjusted with the mo-Vis Configurator Software.

Instructions are written with the expressed intent of use with standard configurations. They also contain important safety and maintenance information, as well as describe possible problems that can arise during use. For further assistance or more advanced applications, contact your supplier or **Stealth Products** at (512) 715-9995 or toll free at (800) 965-9229.

Always keep the operating instructions in a safe place so they may be referenced as necessary.

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.

⚠ CAUTION	This product is designed to be fitted, applied, and installed exclusively by a healthcare professional trained for these purposes. The fitting, application, and/or installation by a non-qualified individual could result in serious injury.

Ordering Documentation 3.1

Additional copies of this manual may be downloaded by accessing the **Stealth Products** website:

https://stlpro.site/stealth-docs

and searching

"*mo-Vis Micro Joystick*"

in the search bar at the top of the page.

Our products are designed, manufactured, and produced to the highest of standards. If any defect in material or workmanship is found, **Stealth Products, LLC** will repair or replace the product at our discretion. Any implied warranty, including the implied warranties of merchantability and fitness for a particular purpose, shall not extend beyond the duration of this warranty. **Stealth Products, LLC** does not warrant damage due to, but not limited to:

- ▪ misuse, abuse, or misapplication of products; and/or
- ▪ modification of product without written approval from **Stealth Products, LLC.**

Any lack or alteration of serial number, where applicable, will automatically void this warranty.

Stealth Products, LLC is liable for replacement parts only. **Stealth Products, LLC** is not liable for any incurred labor costs.

No person is authorized to alter, extend, or waive the warranties of **Stealth Products, LLC**.

Covers/Soft Goods: 2 years

Hardware: 5 years

Electronics: 3 years

In Case of Product Failure 4.1

In the event of product failure covered by our warranty, please follow the procedure outlined below:

1. Call Stealth Products at (512) 715-9995 or toll free at (800) 965-9229.
2. Request a Return Authorization form (RA) from the Returns Department and follow documentation instructions.

IN THE CASE OF ANY SERIOUS INCIDENT OCCURRING IN RELATION TO THIS PRODUCT, A REPORT TO STEALTH PRODUCTS, LLC SHOULD BE MADE IMMEDIATELY.

Warning Labels 5.1

Warnings are included for the safety of the user, client, operator, and property. Please read and understand what the signal words **DANGER, WARNING, CAUTION, NOTICE,** and **SAFETY** mean, and how they could affect the user, those around the user, and property.

⚠ **DANGER**	Identifies an **imminent** situation which, if not avoided, may result in **severe injury**, **death**, and **property damage**.
⚠ **WARNING**	Identifies a **potential** situation which, if not avoided, may result in **severe injury**, **death**, and **property damage**.
⚠ **CAUTION**	Identifies a **potential** situation which, if not avoided, may result in **minor to moderate injury** and **property damage**.
NOTICE	Identifies important information not related to injury, but possible **property damage**.
SAFETY	Indicates steps or instructions for safe practices, reminders of safe procedures, or important safety equipment that may be necessary.

Limited Liability 5.2

Stealth Products, LLC 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.

Stealth Products LLC does not hold responsibility for final integration of final assembly of product to end user.

Stealth Products, LLC is not liable for user death or injury.

Testing 5.3

Initial setup and driving should be done in an open area free of obstacles until the user is fully capable of driving safely.

Intended Use 6.1

The **Micro Joystick** is a small, multifunctional, operable joystick that requires reduced force, designed for people with limited muscular force or neuro-muscular diseases. Thanks to the **Micro Joystick's** flexibility, it can be easily controlled by any body part, such as a finger, chin, or a lip.

An R-net Joystick has a communication cable with an R-net connector. The cable can be directly plugged into the electronics of the wheelchair. The joystick then controls the wheelchair in all its functions (driving, electric gears, etc.).

Features 6.2

mo-Vis' **Micro Joystick** features:

- full proportionality with reduced throw and force (8.5g/0.0187 lbf);
- two (2) tips: small ball or cup designed in a comfortable shape;
- built-in compact and discrete housing;
- two 1/8" (3.5mm) jacks for switch inputs;
- an ability to be linked with one or two switches (on/off and mode switch), with any 1.8" (3.5mm) jack;
- full adjustability to individual possibilities and needs with well-designed electronics;
- easy configurability with the free mo-Vis Configurator Software for positioning of the joystick. (For other parameters, the wheelchair settings are used.); and,
- full R-net compatibility.

Mounting 6.3

The **Micro Joystick** can be mounted at any location on the wheelchair. By attaching the Power Chin Boom to the chair, the **Micro Joystick** can be used as a chin joystick.

The **Micro Joystick** is compatible with Stealth joystick mounts, including:

- the SM600-651M reverse swing-away mount for the SM651;
- The Gatlin tray GAT440M-51M-L or the GAT440M-51M-R;
- The Gatlin GAT451 mount for the Gatlin 400 series; and,
- The ARMS260 series mounts.

Micro Joystick Package 7.1

The following is included in the **Micro Joystick** package:

Product Description:	Part Number:
Micro Joystick Set, with ball and cup tip, integrated cabling, and interface.	IDM-MICRO-R

Micro Joystick Accessories 7.2

For mounting and further personalization, the following accessories are available:

Product Description:	Part Number:
Micro Joystick Set, with integrated cabling and interface.	IDM-39
Micro Joystick Mounting Ring	(included in IDM-39 package)
Quick-to-Mount Half Clamp with 20mm bolt	(included in IDM-39 package)
Quick-to-Mount Rod D6 50mm	(included in IDM-39 package)
Quick-to-Mount Rod D6-D8 60mm	(included in IDM-39 package)

Micro Joystick Protective Covers 7.3

The connections of the Micro Joystick unit have protective covers to avoid the accumulation of dust or moisture during use.

Stealth Products can customize mounting hardware configurations in order to create the best possible fit for a client.

⚠ CAUTION	Keep the protective cover in its place when not using a specific port.

NOTICE	Before inserting a connector into the joystick, remove the protective cover from the desired input port.

NOTICE	Not all items in the Micro Joystick will be used to mount the Joystick onto a Stealth product. All of these items are compatible with the mo-Vis Power Chin Boom.

Joystick Operation 8.1

The movements of the joystick translate accordingly into the motion of the wheelchair or the navigation of its menu. The wheelchair is most commonly controlled by the joystick in the following manner:

- ▪ **Direction:** The joystick is pushed in the direction the wheelchair is intended to move, and the wheelchair moves in that direction.

- ▪ **Speed:** The further the joystick is pushed in any direction from its default (center) position, the faster the wheelchair moves in that direction.

- ▪ **Stop:** When the joystick is released from being pushed in a direction, it returns to its default (center) position and the wheelchair comes to a stop.

⚠ **WARNING**	When the LED flashes to indicate an error and/or after every incident with the wheelchair or the mo-Vis device, contact Stealth immediately to perform a function test.
⚠ **WARNING**	The **Micro Joystick** operates with high sensitivity, requiring sufficient movement coordination and control of force. When operating the joystick, take care to avoid erratic or unsteady movements.
⚠ **WARNING**	When operating the **Micro Joystick**, always follow the instructions provided by the wheelchair manufacturer regarding safely operating the chair on different surfaces and angles of ascent and descent.
⚠ **WARNING**	Users should not use the **Micro Joystick** as the only support for a hand or limb, as irregular movements may disrupt controls.
⚠ **CAUTION**	Avoid hitting obstacles during driving.

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Joystick Safety   8.2

Do not use the **Micro Joystick** if any of the following conditions apply:

- ▪ The joystick handle is damaged, cracked, or missing.
- ▪ The joystick does not return to its default (center) position independently.
- ▪ The joystick does not move to and from its default (center) position smoothly.

In order to change the joystick tip, gently pull on the tip until it lifts off the joystick's metal rod. Then place the replacement tip onto the metal rod until it sits firmly in place.

> ⚠ **WARNING**   Always power off the device when the user is no longer in the wheelchair to avoid unauthorized access or accidental movements.

SAFE OPERATION

It is mandatory to have an on/off switch on the wheelchair which immediately shuts down the chair power and its electronics. It must be within easy reach of the user while operating the wheelchair. This allows the user 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 while operating the wheelchair.

> ⚠ **WARNING**   Do not cover or block the device to avoid uncontrolled behavior of the device or wheelchair.

If the wheelchair responds in an unexpected way during use, the user should immediately release the joystick and/or use the power on/off switch.

Connection Options   8.3

The **Micro Joystick** can connect one or two switches to the interface. One connection is to power the on/off function and the other is to control a mode (input).

The interface has a cable with an R-net BUS connector compatible with the wheelchair electronics. The joystick then controls the wheelchair and all of its functions, including driving, electric gear, lights, etc. It is also capable of powering the wheelchair on or off, as well as issuing mode commands.

Jack on/off (power) = red
Jack mode (input) = yellow

Electromagnetic Compatibility (EMC)   8.4

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).

This product complies with the limit values for Electromagnetic Compatibility (EMC) with respect to power wheelchairs, as set out in the harmonised standards for the EU in the Medical Device Regulation, No. 2017/745.

Preparations 9.1

Only a qualified service technician should install the **Micro Joystick** and its accessories.

⚠ WARNING	An incorrect installation of wheelchair electronics may cause damage to the hardware and/or injury to the user.
⚠ CAUTION	Any connection must always be secured with all the delivered screws. Only use the screws provided with the device.
⚠ CAUTION	Before you begin the installation: Please check the packaging to verify all items have been included. Make sure you have all necessary documentation and knowledge to complete the installation. Check the condition of the device.

Tools 9.2

Use the proper tools to install and adjust the **Micro Joystick** to the desired mounting hardware.

⚠ CAUTION	The use of improper tools may damage the device. Do not over-tighten the screws. Doing so may damage the joystick unit.

Installation Plan 9.3

Set up an installation plan before beginning the installation. This plan should take into account:

- where the **Micro Joystick** will be placed;
- how the **Micro Joystick** will be operated (i.e. by hand, chin or attendant; and,
- **Micro Joystick** parameter settings.

⚠ CAUTION	Any connection must always be secured with all the delivered screws. Only use the screws provided with the device.

⚠ WARNING	Users should not use the **Micro Joystick** as the only support for a hand or limb, as irregular movements may disrupt controls.

⚠ WARNING	Protect the device against bumps. Mind damaging the unit and its wiring. Make sure cabling is mounted in such a way that excessive wear and tear is avoided.

Joystick Installation   9.4

The **Micro Joystick** can be mounted on your wheelchair using several different mounting systems. Please refer to the installation section of the manual for your specific mounting system to learn how to install the Micro Joystick properly.

⚠ **CAUTION**   Only install this product to wheelchairs onto which the manufacturer allows installation of third party parts.

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

⚠ **CAUTION**   The **Micro Joystick** is a Class I Medical Device (MDR 2017/745). All accessories, including switches, must also be compliant with MDR 2017/745.

⚠ **WARNING**   Ensure all cabling is mounted in such a way as to avoid excessive wear and tear.

⚠ **WARNING**   Install the interface unit with the connectors facing downwards. This alignment will help ensure that water does not enter the interface.

Connection Cable Installation 9.5

Insert the connector into its mate and push firmly. The connector is inserted correctly if the yellow pins are completely invisible. To disconnect the cable, firmly hold the connector housing and pull the connectors apart.

Disconnected
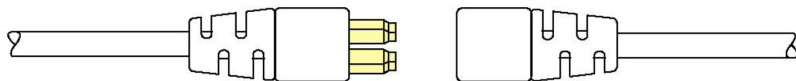
Correctly Connected
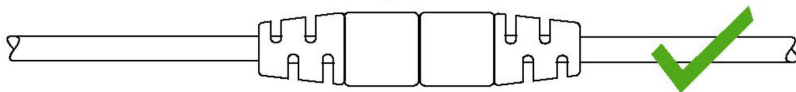
Incorrectly Connected
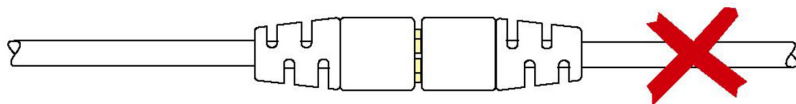
⚠ CAUTION	Before inserting a connector, remove the input's protective cover. Do not discard the protective cover.

Software Capabilities   10.1

The **Micro Joystick** is adjustable with the mo-Vis Configurator Software.

- ▪ The mo-Vis Configurator Software is compatible with the Windows 10 operating system.
- ▪ The mo-Vis Configurator Software is not compatible with Android or iOS systems.

⚠ **WARNING**	Changes in the parameter settings may cause damage to the device or power chair, or may cause injury to people.

⚠ **CAUTION**	Always change parameters and test the outcome without anyone sitting in the power chair.

Software Download   10.2

The mo-Vis Configurator Software can be downloaded on Stealth Products' website (www.stealthproducts.com). For details on how to install and use the software, the user is advised to consult the software manual, included alongside the download.

Please contact your dealer for information about downloading the R-net PC Programming software.

R-net Setup 11.1

For mo-Vis R-net joysticks to operate properly, some R-net parameters need to be set. For information about R-net parameters, please refer to the Curtiss-Wright manual *SK77981-14 | R-net Technical Manual | Chapter 3 -- Programming*.

- R-net Profile Management > Input Device Type (Ch. 3 - 4.4): In most cases, this parameter needs to be set to *Universal* for all mo-Vis joysticks. In combination with certain other devices, it is advised to set this parameter to *JSM*. Please refer to the installation manual of the other devices for more information.

- R-net Controls > Global > Profile Button (Ch. 3 - 7.5): The default setting for this parameter is *Profiles*. To access the control modes for other wheelchair functions, such as seating positions, select *Profiles/ Modes*.

R-net Further Setup 11.2

With the R-net PC programming option, joystick performance and functionalities can be fine-tuned, such as:

• Joystick Throw

JOYSTICK THROW

Throw, as it relates to joystick operation, is the position of a joystick, relative to its default (center) position, when it is stopped in a particular direction. Throw distance, then, is the maximum distance a joystick shaft can be moved in any particular direction.

As it relates to programming, the throw will correlate to the speed at which the wheelchair will move in a given direction; a joystick thrown maximally in a direction will cause the chair to move in that direction at its maximum speed.

When calibrating a joystick, its throw should be set to the maximum distance the user is capable of moving the joystick shaft so that the user's full efforts correspond with the chair's maximum speed output, i.e. setting of 50% will correspond to full throttle at half the joystick's throw distance.

CHANGING THE THROW SETTINGS

1. Plug the R-net programming dongle into an available port in the R-net system.

2. Power on the chair.

3. Connect the PC to the Programming Dongle with the USB cable.

4. Start the R-net PC Programming Software on your PC.

5. Select Read from Controller to load the information from the R-net system to the Configurator software.

6. To change the setting for forward throw, select Controls > Joystick > Joystick Forward Throw.

7. Enter the value for the parameter. (Value range is 25% to 100%, in increments of 1%)

8. Repeat steps 6 and 7 to edit the settings for Joystick Reverse Throw, Joystick Left Throw, and Joystick Right Throw, as necessary.

9. Select Write to Controller to save the changes to the R-net system.

10. Power Cycle the chair (turn it off, then back on) to load the new parameters.

R-net Parameter Settings 11.3

With the mo-Vis Configurator software you can change the parameters of the Micro Joystick. In the dealer level, you will be able to change a number of parameters.

Global parameter	Supported	Version	Solutions
Momentary screens enabled	N		
Change profile while driving	N		
Change speed while driving	N		
Actuator switches while driving	N		
Speed adjust	N		
Profile button	Y	V02.00	
Actuator endstop beep	N		
Sounder volume	Y	V02.03	
Start-up beep	N		
Lock function enabled	N		
Reverse driving alarm	Y	V02.00	

Global parameter	Supported	Version	Solutions
Emergency stop switch	N		
OBP keycode entry	N		
Power-up mode	N		
External profile jack function	N		
Profile/mode Jack detect	N		
On/off jack detect	N		

Profile parameter	Supported	Version	Solutions
Joystick forward throw	Y	V02.01	
Joystick reverse throw	Y	V02.01	
Joystick left throw	Y	V02.01	
Joystick right throw	Y	V02.01	
Joystick deadband	N		Use deadband setting in the mo-Vis Configurator

Profile parameter	Supported	Version	Solutions
Invert left/right JS axis	Y	V02.01	
Invert fwd/rev JS axis	Y	V02.01	
Swap joystick axis	N		Use rotate function in the mo-Vis Configurator
Change mode while driving	Y	V02.00	
Sleep timer	N	V02.00	
Standby timer	Y	V02.00	
Switch to standby	Y	V02.00	
Mode selection in standby	Y	V02.01	
Standby in modes	Y	V02.01	
Standby forward	Y	V02.00	
Standby reverse	Y	V02.00	
Standby left	Y	V02.00	
Standby right	Y	V02.00	
Remote selection	Y	V02.03	
Background	N		No screen to support this.

mo-Vis Configurator Parameter Settings 12.1

The mo-Vis Configurator Software allows users to change the parameters of the **Micro Joystick**, depending on the level of profile assigned.

MOUNTING SETTINGS (DEALER LEVEL)

Setting	Description	Parameters	
Mounting Direction	Changes the joystick axis in 90-degree increments clockwise, providing compensation for joystick rotation.	Default:	0°
		Min.:	0°
		Max.:	270°
		Increments:	90°

DEADBAND SETTINGS

Setting	Description	Parameters	
Deadband	Neutral zone around the joystick's default (center) position	Default:	10%
		Min.:	10%
		Max.:	50%

(***Note:*** *Most wheelchair electronics have their own default deadband setting. It is recommended to keep the deadband at this setting.)*

TILT

The **Micro Joystick** unit is able to detect tilt (in reference to the gravitation of Earth). The wheelchair will stop driving when the *Enable* parameter is set to *On* and the joystick is tilted more than 70° in any direction. The joystick becomes active again if the angle of tilt falls below 60°.

(***Note:*** *the default setting for the tilt sensor is Off.)*

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

COMPENSATION MODE

Setting	Description	Parameters	
Compensation Mode	Defines the activation of the compensation algorithm	*Off*	Always deactivated
		Manual	(De)activated manually by the user
		On	Always activated

*(**Note:** Front wheel-driven wheelchairs are less affected by this factor than rear wheel-driven chairs.)*

Setting	Description	Parameters	
X Compensation	Limits the steering reaction if the wheelchair overreacts on steering commands. (This may happen due to compensation in the X direction that prevents the wheelchair from overcoming an obstacle due to torque loss.)	*None*	No Compensation
		1/2 Y	X=50% of Y level
		2/3 Y	X=66% of Y level
		Equal Y	X=100% of Y level

*(**Note:** The values are based on the compensation in the Y direction.)*

Setting	Description	Parameters	
(De)activation Pattern	Active if Compensation Mode is set to Manual (to activate/deactivate, nudge the joystick forward, then backward, then forward.	*Fast*	Fast execution speed
		Normal	Normal execution speed

*(**Note:** Prevents the wheelchair from creeping after the joystick is released.)*

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COMPENSATION FACTOR

Setting	Description	Parameters	
Compensation Factor	Lowers forward/backward (Y) driving speed on rough terrain. (Wheelchair type and weight impact the compensation factor.)	*Very Weak*	Almost no deceleration
		Weak	Decelerates less than *Normal*
		Normal	Default Setting
		Strong	Decelerates more than *Normal*

*(**Note:** If the joystick is mounted in a location susceptible to bumps and shocks, such as a wheelchair arm, the compensation setting should be set to 'Weak' or 'Very Weak'.)*

⚠ **WARNING** | After adjusting the joystick settings, always test the operation and functioning of the wheelchair before use.

Testing 13.1

After installing the **Micro Joystick**, execute the following tests, in order, before the wheelchair is delivered or put into service.

- ▪ a visual check to ensure that the joystick is intact;
- ▪ an operational test;
- ▪ a driving test; and,
- ▪ a test of the chair's stopping ability.

VISUAL TEST

Check to ensure:

- the joystick is not bent or damaged;
- none of the joystick's housing, cabling, or connectors are damaged; and,
- the joystick returns to its default (center) position upon release.

> ⚠ **WARNING** The device should always be tested without any person sitting in the wheelchair after every alteration of the physical installation or adjustment of the parameters

OPERATIONAL TEST

To perform an operational test, complete the following steps:

1. Activate the wheelchair operating system.
2. Check for any error messages.
3. Gradually push the joystick forward until you hear the chair's parking brakes release (The wheelchair may start moving).
4. Immediately release the joystick. You should hear the parking brake activate within a few seconds.
5. Repeat steps 3 and 4 three times, each time moving the joystick forward, left, right, and backward.
6. Check to ensure the power switch and the mode switch are functioning properly.

DRIVING TEST

Test drive the wheelchair, ensuring that:

- the chair and all its operations are fully functional in all positions the user may use the **Micro Joystick** and any connected switches;
- no cabling or connectors are positioned in such a way that they may become damaged during operation; and,
- the joystick returns to its default (center) position upon release.

> ⚠ **WARNING** Only perform an operational test on a level surface, in an open area free of obstacles.

STOPPING TEST

Drive the wheelchair forward at full speed, then use the power on/off switch to shut the wheelchair down.

▪ The wheelchair should not stop abruptly, but should gradually slow to a stop.

Error Codes 14.1

The illumination of the LED on the joystick interface indicates the operational status of the joystick. The table below describes the states the LED can indicate:

R-net Status	Tilt Parameter	Joystick Tilted	LED Status
Out of Focus	-	-	LED Flashes as heartbeat
In Focus	Enabled	N	LED on
In Focus	Enabled	Y	LED Flashes as heartbeat
In Focus	Disabled	Y	LED on
In Focus	Disabled	N	LED On
Configuring	-	-	LED flashes quickly
Power Cycle	-	-	LED flashes as heartbeat
Error	-	-	LED flashes error code

When a fault occurs, the LED of the **Micro Joystick** will start to flash. A long delay is followed by a number of flashes with a short delay. Count the number of flashes and look up the corresponding error message in the table below:

Flash Count:	Reason:	Required Action:
1	-	-
2	Connection Cable/Driver Issues	Check/Replace Cable to Wheelchair and/or check/replace sensor cable (if available), or Replace PCB
3	Power Supply	Check R-net Cable and/or Replace PCB
4	Joystick/Sensor Fault	Check/Replace Joystick
5	-	-
6	ADC - Internal Analog to Digital Converter	Replace PCB
7	Test Flag Failed or Diagnostic Failed	Redo Tests and/or Replace PCB
8	CPU Fault	Replace PCB
9	Scheduler Fault	Update Software or Replace PCB
10	Coding Error	Update Software or Replace PCB

Fault Logs 14.2

FAULTS

The configurator software maintains a fault log with fault counters. Each time a specific fault occurs, its counter will increase by one. (The maximum count value is 254.) The fault log can be accessed by the configurator (which requires Dealer-level profile access), which is then able to clear one or all of the fault counters. Reference the information presented in the following chart:

Fault:	Reason for Fault:	Required Action:
CPU Error: RAM	CPU consistency check failed	Replace PCB.
CPU Error: FLASH		
CPU Error: EEPROM		
Run Error: Scheduler	Firmware consistency check failed	- Update software. - Replace PCB.
Code Error: Framework		
Code Error: Application		
MSP Command Corrupt	Corrupt Command Received	Connection with PC (Configuration Software) went wrong, try again.
MSP Command Unknown	Unknown Command Received	Connection with PC (Configuration Software) went wrong. Update Firmware or Update Configurator Software. Try again.
MSP Sub Command Unknown	Unknown Sub Command Received	
MSP Argument Invalid	Invalid Argument Received	
MSP Device Not Ready	Device not ready to receive MSP command	
MSP Device Wrong State	Device unable to receive MSP command in current state	
PCB Test Failed	Factory test failed	A fault occurred during factory testing.
Assembly Test Failed		

Fault:	Reason for Fault:	Required Action:
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 test(s) and/or Replace PCB.
ADC	ADC Conversion error	- Check R-net Cable, Replace PCB Interface.
R-net UART Overflow	UART send queue is full.	Replace PCB.
R-net UART Underflow	UART receive queue is empty.	
R-net Communication Timeout	Maximum number of packet re-transmissions is reached.	
R-net Tx Overflow	Packet Transmit Buffer is Full.	
R-net Rx Overflow	Packet Receive Buffer is Full	
R-net Invalid Seq Nr	Received a Packet with an Invalid Sequence Number	
R-net Data Packet Error	Data Packet ACK mismatch	
R-net Descr Error	Invalid Packet Data Descriptor	
R-net API Version Error	The R-net Chip Contains an Invalid API Version	Load the latest API version into the R-net chipset with the R-net Dongle.
R-net Chip Tripped Error	The R-net Chip has encountered an Internal Error.	Internal chipset error: Replace PCB R-net system error: solve R-net system error.
Communication	Communication with the sensor (joystick failed)	- Check Sensor (joystick) cable. - Replace sensor (joystick).
Joystick (Sensor)	Faulty sensor (joystick)	
Accelerometer	Accelerometer failed	Replace PCB Interface.

Technical Data   15.1

JOYSTICK CONNECTORS

- 1/8" (3.5mm) mono jack input (on/off)
- 1/8" (3.5mm) mono jack input (mode)
- Mini USB
- Wheelchair connector cable

JOYSTICK DATA

- Operational Force: 8.5g (0.0187 lbf)
- Angle from Center to End: 10°
- Length of Joystick from Mechanical Pivot: .75 in. (19mm)
- Travel from Center: .13 in. (3.3mm)
- Maximum Vertical Load: 7,647g
- Maximum Horizontal Load: 4,079g
- Expected Life: over 2,800,000 rotations
- Mass: 225g
- Interface Cord Length: 70.9 in. (180cm)
- Joystick Cord Length: 55.11 in. (140cm)
- Operating Temperature: -13°F to 122°F (-25°C to 50°C)
- Storage Temperature: -40° to 149°F (-40°C to 65°C)
- Immunity Level (ISO7176-21): 20V/m (26MHz to 2.5GHz)
- Emission Level (ISO7176-21): CISPR 11, Class B
- ESD (ISO7176-21): 8kV Air (4kV Contact)

Dealer Assistance 16.1

During first time use by the client, it is advised that the dealer or service technician not only install the device, but also explains the configuration and different possibilities to the customer (i.e., the user and/or the attendant). If needed, the dealer can make final adjustments.

User Testing 16.2

It is important that the customer is fully aware of the installation of the **Micro Joystick**, how to use it, and how it can be adjusted to fit the client comfortably. As a dealer, proceed as follows:

▪ Explain and show the customer how you have executed the installation and explain the function.

Have the user test the position of the **Micro Joystick**.

▪ Is the hardware in the proper position for the client?
▪ Can the user safely operate all controls with minimal effort?

If needed, make any adjustments to the positioning.

Explain possible problems to the customer and how to address them.

Conditions of Use 16.3

The **Micro Joystick** 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 technician to the user and/or attendant during the first time use.
▪ If the usage conditions change significantly, please contact your dealer or a qualified service technician to avoid unintended damage.

Maintenance   17.1

The **Micro Joystick** is designed to be maintenance-free. Under the circumstances of regular use, the joystick, interface, and assembly parts do not require additional maintenance.

⚠ **CAUTION**	Always check all mounting hardware, making sure each fastener is properly tightened before using the Micro Joystick.

SAFETY	Replace or repair parts as needed.

NOTICE	Improperly installing the device or altering it in any way will void its warranty.

Cleaning   17.2

- use a soft damp cloth to clean the device.
- Ensure that all cleaners are approved for finished steel, aluminum, plastic, and upholstered surfaces.
- The handles of the joystick can be removed to clean them:
  - You may briefly immerse the handle in warm water with a gentle cleaning agent. Let the handle dry before putting it back on.
  - If the handle is damaged, worn out, or remains dirty, please contact Stealth Products to replace it.

⚠ **CAUTION**	Do not immerse in water or use excessive amounts of liquid. Do not apply additional lubricants to the moving parts.

⚠ **WARNING**	As dust and dirt could lead to reduced functionality, all parts of the device should be cleaned on a regular basis (monthly) or as needed.

Monthly Check   17.3

Monthly, or as needed, check to ensure:

- all bolts and screws are still tightened firmly;
- The wiring has sustained no damage; and,
- none of the joystick unit's parts have suffered excessive wear or tear.

A yearly check of the wheelchair and its operating systems by a qualified technician is recommended.

Warranty Information

Home Page

Online User Manual

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