

# Compact Joystick

<b>Code(s):</b>	0035-7003a Compact Joystick Omni
	0035-7004a Compact Joystick Omni Light
	0035-7005a Compact Joystick HMC
	0035-7006a Compact Joystick HMC Light
	0035-7013a Compact Joystick HMC Tilt Sensor
<b>Related Parts:</b>	0035-7007a Gooseneck Switch Holder
	0035-7008a Gooseneck Switch Completed
	0035-7009a PERMOfix CJ Set
	0035-7011a Compact Joystick Chin Control Kit

## 1 General

The **Compact Joystick (CJ)** is an input device that can be connected to the Easy Rider (0035-7005a – CJ HMC or 0035-7013a CJ HMC Tilt Sensor) or to systems that allow special controls with a SUBD-9 pin connector (0035-7003a – CJ Omni).

- It's a proportional joystick module in a small compact housing.
- The joystick D50800 from PG Drive Technology is used. It is a very reliable contactless joystick which meets the most rigid requirements
- The CJ can be adjusted to any individual needs and possibilities of the user. This can be done mechanically – see different choices of joysticks – or by adjusting the parameters in the Easy Rider.
- We can install the CJ in a good position through the mounting kit which is PERMOfix compatible.
- Because the CJ has a standard shaft diameter, it will accept adaptive knobs available on the market.
- The CJ is completely protected against moisture, which makes it suitable to use outdoors.



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# 2 Operation

## 2.1 Introduction

The CJ-HMC is a joystick module that can directly be connected to the ER or MD control system. So we refer to the ER or MD manual how to setup the complete wheelchair. The CJ-Omni is a joystick module that can directly be connected to systems that allow special controls with a SUBD-9 pin connector. More information about how to connect and setup the CJ-Omni can be found in the appropriate manual. The relevant contents of this chapter should be included in the wheelchair operating guide. Further copies of this document are available from HMC International in either written or disk (Adobe PDF) format. Copies of this document should not be made without the expressed permission of HMC International.

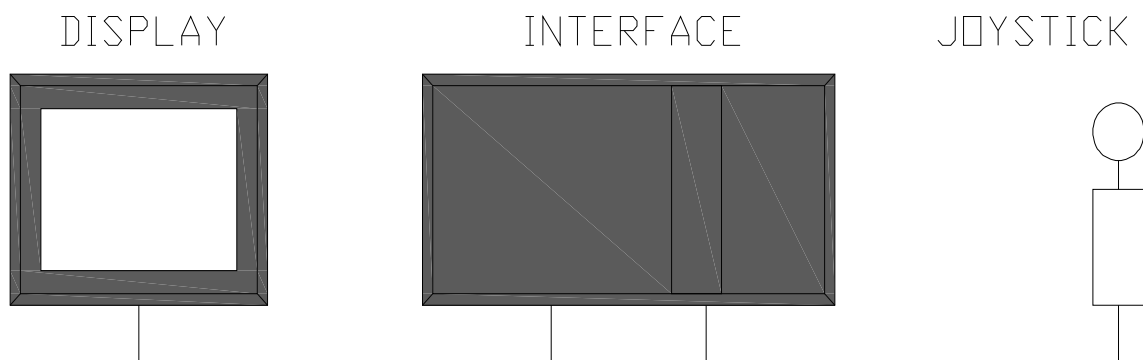
The operation of the ER or MD varies dependent on programming. This chapter covers the special types of operation for the CJA-HMC. For a complete description of the system we refer again to the ER or MD manual. It is the responsibility of the wheelchair manufacturer or local dealer to ensure that only the relevant sections of this chapter are included in the wheelchair's operating manual.

Please read this chapter carefully - it will help you to keep your wheelchair reliable and safe.

## 2.2 General

### 2.2.1 CJ HMC (Tilt) for Easy Rider / Magic Drive

An ER or MD control system comprises a minimum of 3 modules - Joystick Module, graphic display and interface box. Because of the modular design, the depth of the control system can be greatly increased. The following diagram shows the basic set-up.



## 2.2.2 CJ Omni for third party systems that allow special controls with a SUBD-9 pin connector

See the appropriate manual how to install this joystick.

## 2.2.3 Handling

Avoid knocking your control system and especially the joystick. Be careful not to strike obstacles with the control system or joystick when you drive. Never drop the control system.

When transporting your wheelchair, make sure that the control system is well protected. Avoid damage to cables.

## 2.2.4 Operating Conditions

Your control system uses industrial-grade components throughout, ensuring reliable operation in a wide range of conditions. However, you will improve the reliability of the control system if you keep exposure to extreme conditions to a minimum.

Do not expose your control system or its components to damp for prolonged periods. If the control system becomes contaminated with food or drink clean it off as soon as possible.

## 2.2.5 Cleaning

Clean the control system and the joystick with a cloth dampened with diluted detergent. Be careful when cleaning the joystick.

Never use abrasive or spirit-based cleaners.

## 2.3 Controls

The controls typical for the CJ are explained in this section.

### 2.3.1 Joystick

The primary function of the joystick is to control the speed and direction of the wheelchair. The further you push the joystick from the centre position the faster the wheelchair will move. When you release the joystick the brakes are automatically applied.

If the wheelchair is fitted with actuators, the joystick can also be used to move and select actuators.

### 2.3.2 Switches and Led



#### 2.3.2.1 External On/Off Switch Jack

This allows the user to turn the control system on and off using an external device, such as a buddy button.

#### 2.3.2.2 External Profile Switch Jack

Depending on the electronic system the external profile switch jack has a different purpose.

For the ER and MD system the external profile switch jack is the function button.  
 For the systems which allows SUBD-9 pin input it is general the mode or profile button.

### 2.3.2.3 Indication LED

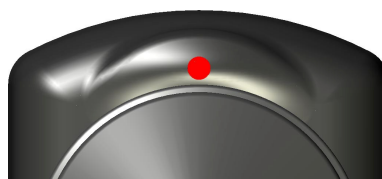
The indication LED is used to give some information to the user. There is only one LED available. This limits the possibilities to give detailed information. But at the other hand it keeps it simple for the user.

CJ State Indication Chart		
	Status Indicator	Status of CJ
Normal Operation	Green	system is switched on
	Orange	tilt modus
Failure	1 green + 1 red pulse	REF SIGNAL
	1 green + 2 red pulses	X or Y IN, DUAL
	1 green + 3 red pulses	X or Y IN, RANGE
	1 green + 4 red pulses	REF OUT
	1 green + 5 red pulses	X OUT
	1 green + 6 red pulses	Y OUT
	1 green + 7 red pulses	INTERNAL ERROR
	1 green + 8 red pulses	WATCHDOG
	1 green + 9 red pulses	PROCESSOR ERROR
	1 green + 10 red pulses	PROCESSOR ERROR

## 2.4 Diagnostic Screen or Acoustic Feedback

When the control system safety circuits have operated and the control system has been prevented from moving the wheelchair a diagnostic blinking LED signal will be displayed. This indicates a system trip, i.e. the CJ has detected a problem somewhere in the wheelchair's electrical system.

The indication LED will flash periodically alternated with a green flash. The number of red flashes is an indication of the fault.



## 2.5 Getting Ready to Drive

- Operate the on/off switch.
- Check that you select a driving mode which suits you.
- Push the joystick to control the speed and direction of the wheelchair.

**Remark!** If you push the joystick before or just after you switch the control system on, generally the wheelchair electronics will enter an error state. You must release and centre the joystick to resume normal operation.

## 2.6 Tips for Using your Control System

### 2.6.1 Driving - General

Make sure that the control system is mounted securely and that the joystick position is correct. The hand or limb you use to operate the joystick should be supported, for example by the joystick modules arm pad. Do not use the joystick as the sole support for your hand or limb - wheelchair movements and bumps could upset your control.

### 2.6.2 Driving Technique

The control system interprets your joystick movements and produces appropriate movements of your wheelchair. You will need very little concentration to control the wheelchair, which is especially useful if you are inexperienced. One popular technique is to simply point the joystick in the direction you want to go. The wheelchair will “home-in” on the direction you push the joystick.

The further you push the joystick away from the rest position, the faster the wheelchair will go. Releasing the joystick will stop the wheelchair.

**Remark!** The wheelchair user must be capable of driving a wheelchair safely. HMC International NV accepts no liability for losses of any kind arising from failure to comply with this condition.

### 2.6.3 Slow or sluggish movement

If the wheelchair does not travel at full speed or does not respond quickly enough, and the battery condition is good, there may be a nonhazardous fault. Contact your service agent.

## 2.7 Precautions for Use

In the event of the wheelchair moving in an unexpected way **RELEASE THE JOYSTICK**. This action will stop the wheelchair under standard circumstances.

### 2.7.1 Hazards

Do not drive the wheelchair:

- Beyond restrictions indicated in your wheelchair user manual, for example maximum inclines, curb height etc.
- In places or on surfaces where a loss of wheel grip could be hazardous, for example on wet grassy slopes.
- If you know that the control system or other crucial components require repair.

**Although the CJ and the control system is designed to be extremely reliable and each unit is rigorously tested during manufacture, the possibility of a system malfunction always exists (however small the probability). Under some conditions of system malfunction the control system must (for safety reasons) stop the chair instantaneously. If there is any possibility of the user falling out of the chair as a result of a sudden braking action, it is imperative that a restraining device such as a seat belt is supplied with the wheelchair and that it is in use at all times when the wheelchair is in motion. HMC International NV accept no liability for losses of any kind arising from the unexpected stopping of the wheelchair or arising from the improper use of the wheelchair or control system.**

**Do not operate the control system if the chair behaves erratically, or shows abnormal signs of heating, sparks or smoke. Turn the control system off at once**

**and consult your service agent. HMC International NV accepts no liability for losses of any kind arising from failure to comply with this condition.**

**Electronic equipment can be affected by Electro Magnetic Interference (EMI). Such interference may be generated by radio stations, TV stations, other radio transmitters and cellular phones. If the chair exhibits erratic behaviour due to EMI, turn the control system off immediately and consult your service agent. HMC International NV accepts no liability for losses of any kind arising from failure to comply with this condition.**

**It is the responsibility of the chair manufacturer to ensure that the wheelchair complies with appropriate National and International EMC legislation. HMC International NV accepts no liability for losses of any kind arising from failure to comply with this condition.**

**The wheelchair user must comply with all wheelchair safety warnings. HMC International NV accepts no liability for losses of any kind arising from failure to comply with this condition.**

## 2.8 Safety Checks

The electronic circuits in your control system have been designed to be extremely safe and reliable. The on-board microcomputer carries out safety checks at up to 100 times per second. To supplement this safety monitoring you should carry out the following periodic checks.

If the control system fails any of these checks, do not use the wheelchair and contact your service agent.

### 2.8.1 Daily Checks

Joystick: - With the control system switched off, check that the joystick is not bent or damaged and that it returns to the centre when you push and release it. If there is a problem do not continue with the safety checks and contact your service agent.

### 2.8.2 Weekly Checks

Parking brake: - This test should be carried out on a level floor with at least one meter clear space around the wheelchair.  
- Switch on the control system.  
- Check that the LED remains on, after initialization and that the battery gauge is displaying a reasonable amount of charge.  
- Push the joystick slowly forwards until you hear the parking brakes operate. The chair may start to move.  
- Immediately release the joystick. You must be able to hear each parking brake operate within a few seconds.  
- Repeat the test a further three times, pushing the joystick slowly backwards, left and right.

Connectors: - Make sure that all connectors are securely mated.

Cables: - Check the condition of all cables and connectors for damage.

Joystick gaiter: - Check the thin rubber gaiter or boot, around the base of the joystick shaft, for damage or splitting. Check visually only, do not handle the gaiter.

Mounting: - Make sure that all the components of the control system are securely mounted. Do not overtighten any securing screws.

### 2.8.3 Servicing

To ensure continued satisfactory service, we suggest you have your wheelchair and control system inspected by your service agent after a period of 1 year from commencement of service. Contact your service agent for details when the inspection is due.

## **2.9 Programming**

The control system can be programmed to meet your needs. Programming can be performed using the specialist software and hardware. Contact your dealer to know which tools you need.

If you re-program your control system, make sure that you observe any restrictions given in your wheelchair user manual. Note any changes you make for future reference.

**Remark!** Programming should only be conducted by healthcare professionals with in-depth knowledge of the electronic control systems and the CJ. Incorrect programming could result in an unsafe set-up of a wheelchair for a user. HMC International NV accepts no liability for losses of any kind if the programming of the control system is altered from factory pre-set values.

## **2.10 Servicing**

All repairs and servicing must be carried out by authorized service personnel. Opening or making any unauthorized adjustments or modifications to the control system or its components will invalidate any warranty and may result in hazards to yourself or other people, and is strictly forbidden.

HMC International NV accepts no liability for losses of any kind arising from unauthorized opening, adjustment or modifications to the R-net control system.

If the control system is damaged in any way, or if internal damage may have occurred through impact or dropping, have the product checked by qualified personnel before operating. HMC International NV accepts no liability for losses of any kind arising from failure to comply with this condition.

## **2.11 Warranty**

The CJ is covered by a warranty period defined by the service agent. For details of the warranty period, please contact your service agent.

The warranty will be void if the CJ has:

- Not been used in accordance with the CJ user manual – this manual – from HMC International.
- Been subject to misuse or abuse.
- Been modified or repaired by non-authorized persons.

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# 3 Installation

## 3.1 Connection to the electronics

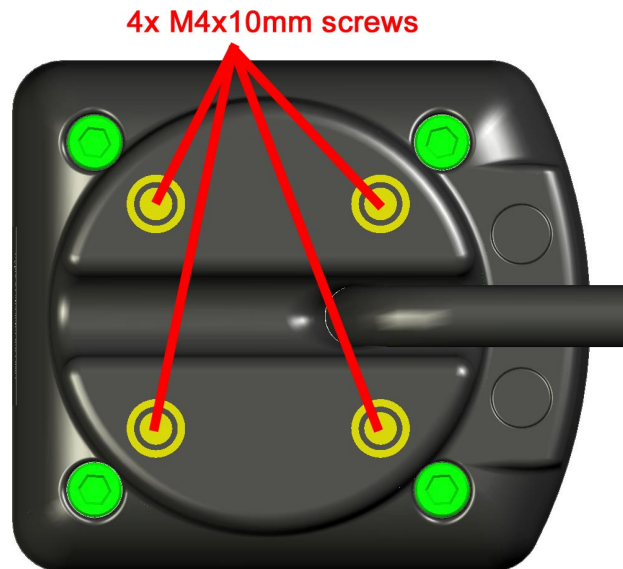
We refer to the appropriate manual of the wheelchair electronics how to connect the CJ to the system.

## 3.2 Mounting

### 3.2.1 Joystick Module Mounting

#### 3.2.1.1 General

The Joystick Module should be secured using 4 screws M4 with a maximum penetration of 10mm. There are 4 holes in a pitch circular diameter (PCD) – PCD 32mm – reserved for mounting. Be careful not to overtighten the screw. 4 M4 screws of 10mm are delivered with the Permofix CJ Set.



### 3.2.1.2 Mounting Support

A fitting mounting support can be ordered separately. Refer to *Mounting Instruction of PERMOfix CJ Set (0035-7009a)* for more details.



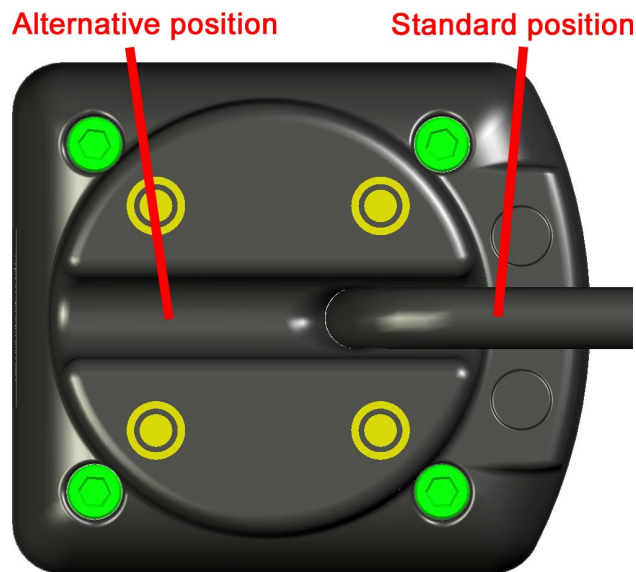
### 3.2.1.3 CJ with Chin Control Set and mounting set

The joystick can easily be adapted so it can be used as a Chin Control. Refer to *Mounting Instruction of the CJ Chin Control Kit (0035-7011a)* for more details.



### 3.2.1.4 Strain Release

The strain release can be mounted in different way. The picture shows the standard mounting position and the alternative positions.



### 3.2.2 Cables

The cables to the different modules must be routed and secured in such a way as to prevent damage to them, for example by cutting or crushing. Contact HMC International NV if you need further advice.

## 3.3 Joystick Module Wiring

Make sure the CJ is well connected to the electronics of the wheelchair and the routing of the cable prevents damaging the cable. This to avoid a broken cable due to turning parts on the wheelchair or the possibility that the cable is stuck behind an obstacle.

## 3.4 Functionality Tests

Perform the following tests, in order, on each wheelchair before dispatch.

**These tests should be conducted in an open space and a restraining device such as a seat belt should always be used. HMC International NV accepts no liability for losses of any kind arising from failure to comply with this condition.**

### 3.4.1 Joystick and Gaiter

- Check that the joystick is not bent or damaged.
- Check the thin rubber gaiter or boot, around the base of the joystick shaft, for damage or splitting. Check visually only, do not handle the gaiter.
- Check that the joystick returns to the centre position when you push and release it.

### 3.4.2 Operational Test

This test should be carried out on a level floor with at least one meter clear space around the wheelchair.

- Switch on the control system.

- Check that the battery gauge remains on, or flashes, after one second.
- Push the joystick slowly forwards until you hear the parking brakes operate. The chair may start to move.
- Immediately release the joystick. You must be able to hear each parking brake operate within a few seconds.
- Repeat the test a further three times, pushing the joystick slowly backwards, left and right.

### **3.4.3 Test Drive**

- Drive the wheelchair and make sure that it operates correctly for all positions of the user controls.

### **3.4.4 Soft-Stop Test**

- Drive the wheelchair at full forward speed and switch the control system off.
- The wheelchair must not stop suddenly, but should decelerate to standstill.

## **3.5 Electromagnetic Compatibility (E.M.C.)**

The CJ has been tested on a generic wheelchair for compliance with EC directive 89/336/EEC, and the EMC requirements of EN12184. You, as wheelchair manufacturer or dealer, should consider EMC and perform relevant tests if necessary.

## **3.6 Battery Gauge**

Refer to Chapter 2 for how to read the battery gauge.

The battery gauge becomes red when the battery voltage falls below 23.3V whilst the wheelchair is driving on a level surface.

# 4 Addendum CJ-HMC Tilt

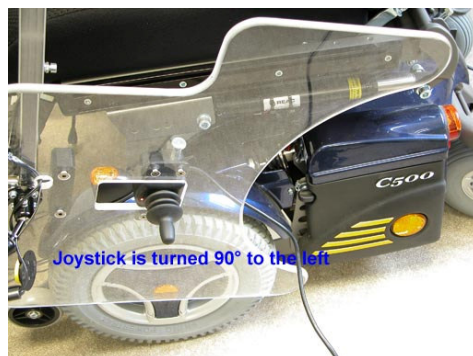
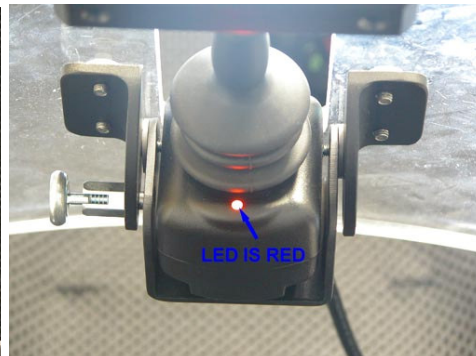
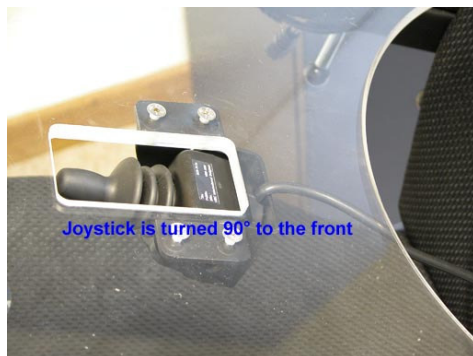
## 4.1 General

The CJ-HMC Tilt is a special compact joystick. In vertical mounted position it operates just like the normal CJ-HMC.

The tilt function becomes active whenever the CJ is rotated 60° out of vertical position. At that time the CJ will send out neutral values of the driving signals.

This is useful when a CJ is mounted in a table that swings away to the side of the wheelchair. At that time the CJ is rotated 90° out of vertical position and can be touched by someone who walks next to the wheelchair resulting in a dangerous situation. With a CJ-HMC Tilt in that position the situation is secure since the joystick will send out neutral values of the driving signal also when the joystick lever is out of neutral position.

Here is an example of a CJ-HMC Tilt built-in in a table. Pay attention to the colour of the LED.



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# 5 Addendum CJ-HMC-Light / CJ-Omni-Light

## 5.1 CJ Light - standard



## 5.2 CJ Light with Chin Control Set and mounting set

The joystick can easily be adapted so it can be used as a Chin Control. *Refer to Mounting Instruction of the CJ Chin Control Kit (0035-7011a) for more details.*



## 5.3 Adaptations

The CJ Light is a modified CJ. We have made following adaptations mechanical adaptations:

- limited the stroke of the lever to 75% of the stroke of the lever of the CJ.
- limited the operation force to 50% of the operation force of the CJ.
- lessen the height of the lever with 15mm.

The mounting and programming of the CJ Light is exact the same as the CJ.

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