

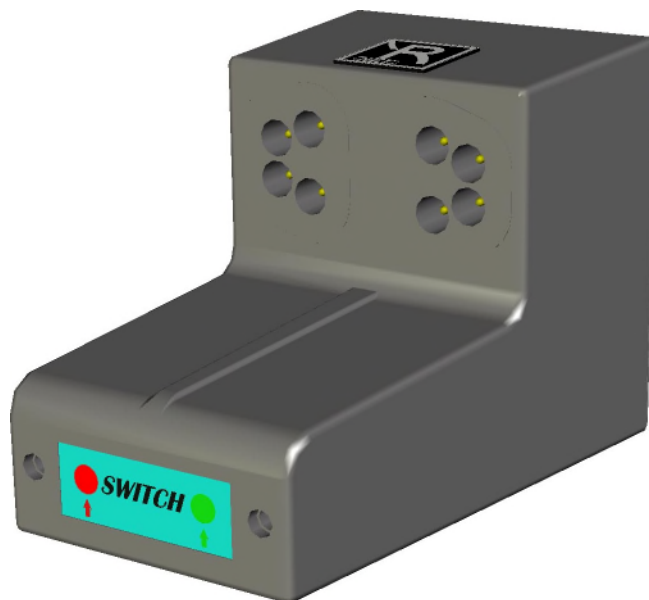
# Remote Button Interface

Code(s): 0049-7001a Remote Button Interface

## 1 General

The **Remote Button Interface** (RBI) for R-NET is a remote input device and is coupled to the R-NET wheelchair electronics.

- It is a switch box in a small compact housing.
- Up to 6 switches can be connected to the RBI.
- To each switch you can assign a function and mode.
- Choose between normal and latched axis.
- The RBI can be directly connected to the R-NET system.
- The RBI should be mounted on a place protected against moisture.
- Allows you to operate your actuators or lights by direct control.



# 2 Operation

## 2.1 Introduction

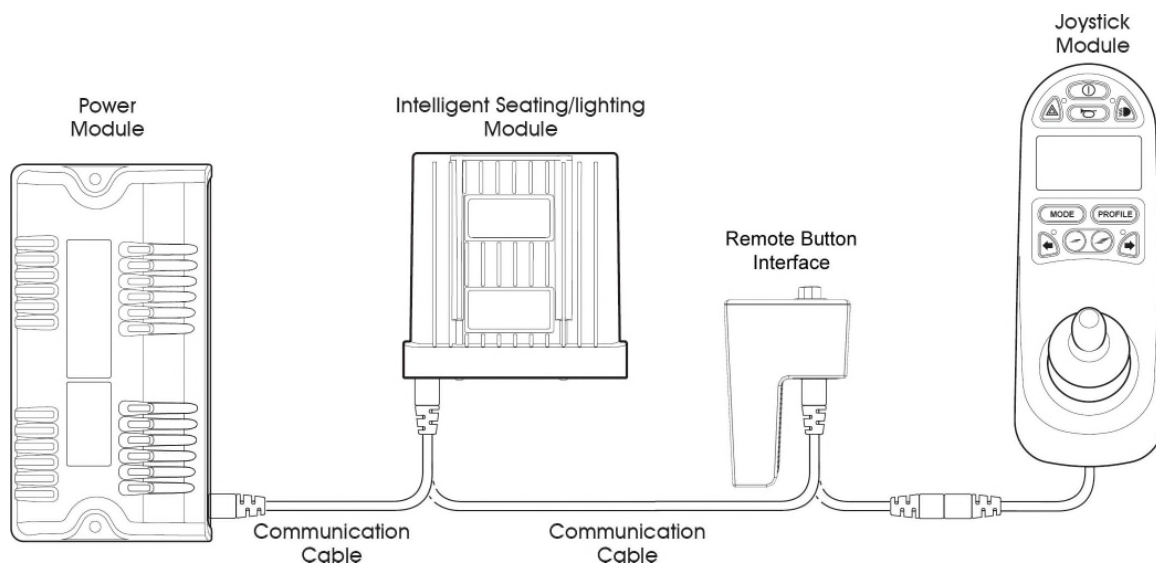
The RBI is a remote switch module that can directly be connected to the R-NET control system of **PG Drives Technology** (PDGT).

The operation of the R-net varies dependent on programming. This chapter covers the special types of operation for the RBI. For a complete description of the R-Net system we refer to the SK77981 from PGDT. 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

An R-net control system set up for the RBI comprises a minimum of four modules – a Power Module, some kind of seating/lighting module, an RBI and a Joystick Module. Because of the modular design, the depth of the control system can be greatly increased. The following diagram shows the basic set-up where the RBI can operate in.



### 2.2.1 Handling

Avoid knocking your control system and especially the RBI. Be careful not to strike obstacles with the control system or RBI 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.

## 2.2.2 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.

## 2.2.3 Cleaning

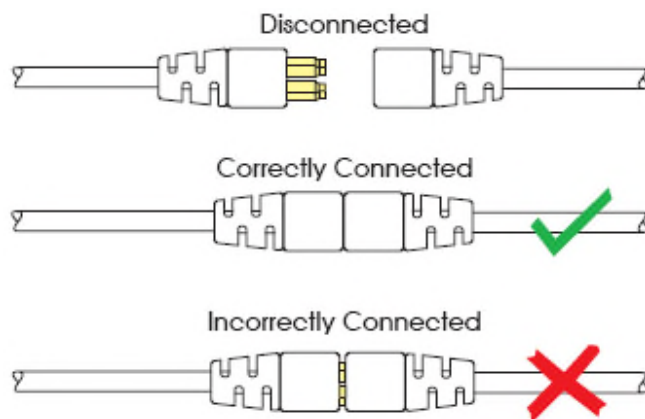
Clean the control system and the RBI with a cloth dampened with diluted detergent. Be careful when cleaning the RBI. Never use abrasive or spirit-based cleaners.

## 2.3 Mating Connectors

To connect the Communication Cables:

Holding the connector housing, firmly push the connector into its mate until you can no longer see the yellow plastic.

The connectors are secured using a friction system.

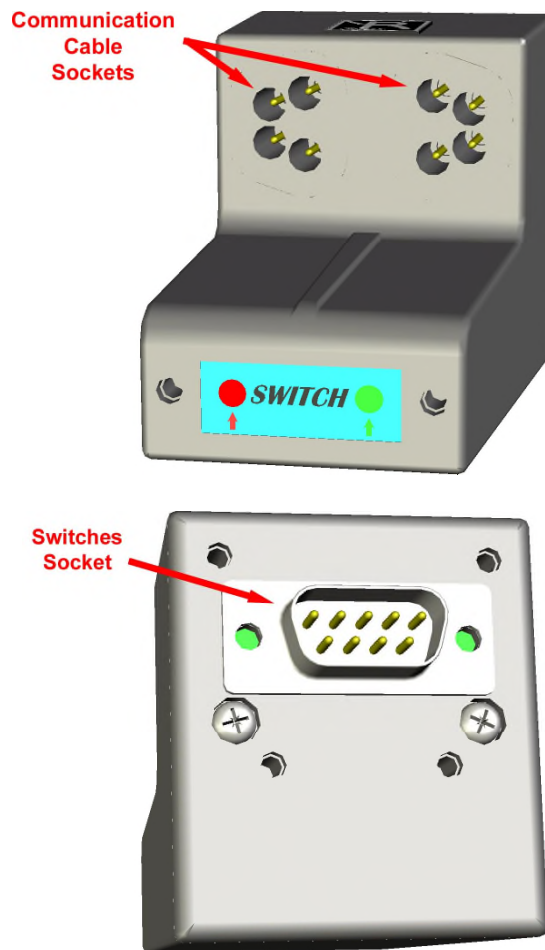


To disconnect the Communication Cables:

Holding the connector housing firmly, pull the connectors apart.

## 2.4 Controls

The RBI allows you additional controls next to the standard controls of the basic R-Net system.



### 2.4.1 RBI

The primary function of the RBI is to control the different axis and lights of the R-Net system. You have the possibility to control these feature while you are in drive mode or actually driving. It is a *'remote'* device. This means that the RBI is not the input device of the system. It operates next to the input device of the system on a *'remote'* base.

## 2.4.2 Switches and Led

### 2.4.2.1 SUBD9 connector

The SUBD9 connector allows you to connect up to 6 switches. The switches must be normal open (NO) switches. Connect them between the proper switch pin and the GND.

pin	function
1	SW1 - 50kOhm to 6V
2	SW2 - 50kOhm to 6V
3	SW3 - 50kOhm to 6V
4	SW4 - 50kOhm to 6V
5	SW5 - 50kOhm to 6V
6	SW6 - 50kOhm to 6V
7	12V - max 100mA*
8	GND
9	12V - max 100mA*

\* can not be cumulated.

### 2.4.2.2 Indication LEDs

The RBI has 2 indication LEDs. These LEDs are used to give some information to the user. Using to 2 LEDs limits the possibility to give detailed information. But at the other hand it keeps it simple for the user.

RBI State Indication Chart		
	Status Indicator	Status of RBI
Start up	Red/Green	Starting up
	Red/Green pulse slow	Reconfiguration of system
	Red/Green pulse fast	Restart request
Normal Operation	Green	Idle
	Red	a button is pressed
Failure	1 red pulse	Failure -> Not Calibrated or Tested
	2 red pulses	Failure -> Internal Error

## 2.5 Precautions for Use

In the event of the actuators moving in an unexpected way **RELEASE ALL THE SWITCHES**. This action will stop the actuators under any circumstances.

### 2.5.1 Hazards

Do not drive the wheelchair or move the actuators:

- 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 R-net 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 and/or dealer 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.**

## 2.6 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.

### 2.6.1 Daily Checks

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

### 2.6.2 Weekly Checks

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

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

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

### 2.6.3 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.

## 2.7 Programming

The control system can be programmed to meet your needs. Programming can be performed using the specialist R-net software and Dongle.

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 PGDT electronic control systems and the CJ-RNET. 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.

## 2.8 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.

## 2.9 Warranty

The RBI 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 RBI has:

- Not been used in accordance with the RBI user manual – this manual – from HMC International.
- Not been used in accordance with the R-net control system Technical Manual, SK77981, from PGDT.
- Been subject to misuse or abuse.
- Been modified or repaired by non-authorized persons.

# 3 Installation

## 3.1 R-Net Operation

Study Chapter 2. It is important that the operation information in Chapter 2 is supplied, either as part of the wheelchair user handbook or as a separate document.

## 3.2 Program Settings

It is the wheelchair manufacturer's or dealer responsibility to program the control system to suit the vehicle model and ensure safe operation in compliance with relevant legal requirements over the whole of the operating range. HMC International NV accepts no liability for losses of any kind due to failure to, or incorrect programming of the R-net Control System. Refer to Chapter 4 for programming details.

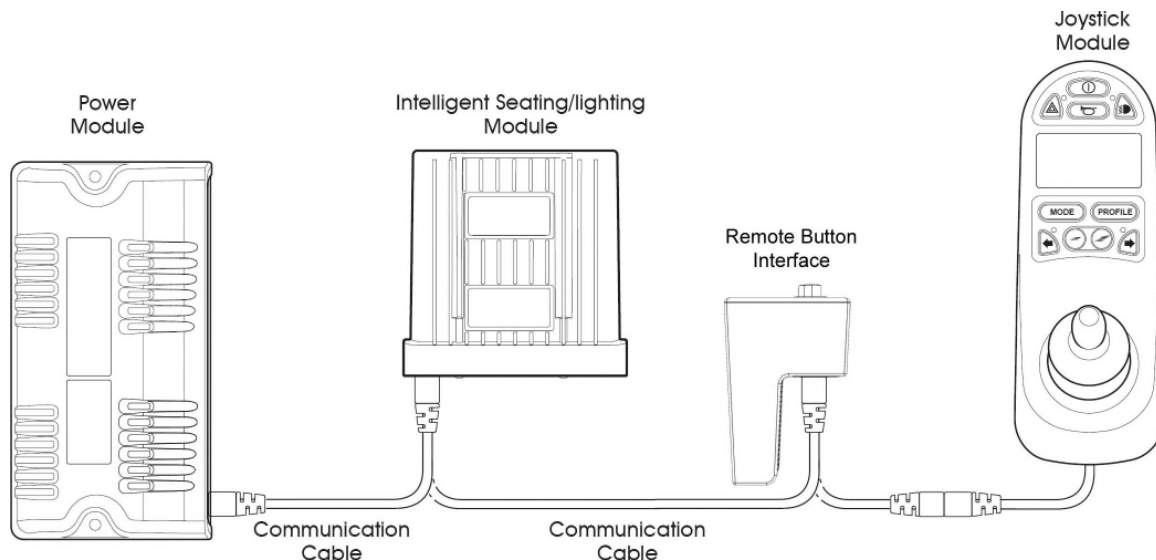
**Programming should only be conducted by healthcare professionals with in-depth knowledge of PGDT electronic control systems and of the RBI of HMC International NV. Incorrect programming could result in an unsafe setup of a wheelchair for the user.**

## 3.3 Connections

The following is a selection of the most common configurations

### 3.3.1 Control Configurations

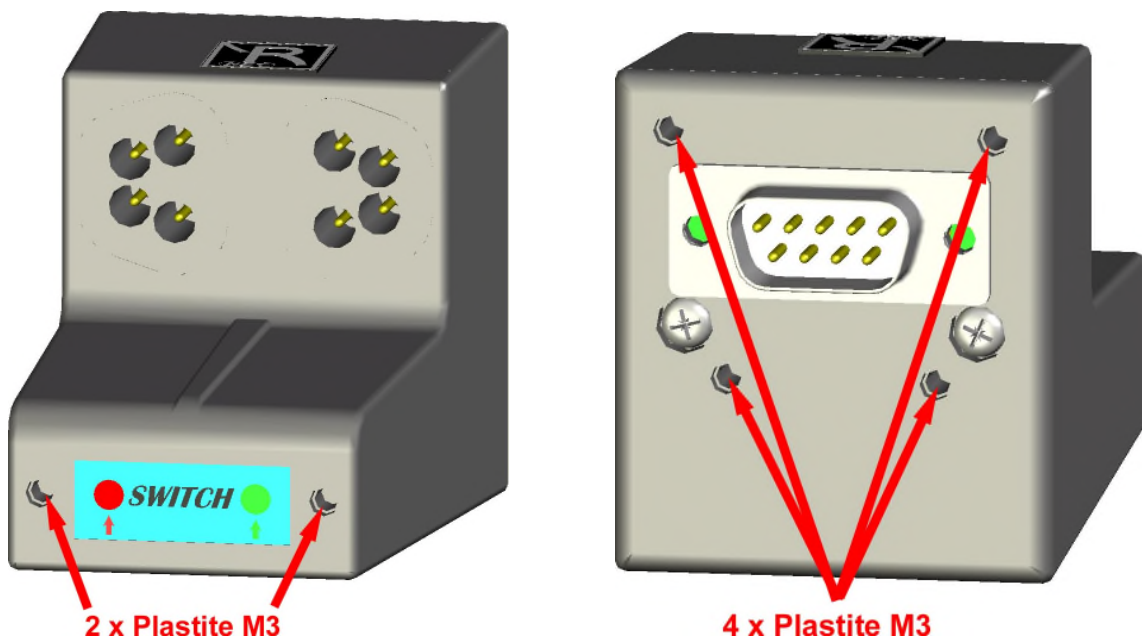
Consists of a Power Module, some kind of Seating/Lighting Module 3 Communication Cables and a Joystick Module.



## 3.4 Mounting

### 3.4.1 RBI Mounting

The RBI should be secured using 6 screws Plastite M3 with a maximum penetration of 5mm for the 2 mounting holes in the front, 8mm for the holes 4 mounting holes in the rear. Be careful not to overtighten the screw.



### 3.4.2 Power Module and ISM Mounting

We refer to the R-NET Control System Technical Manual – SK77981 – of PGDT.

### 3.4.3 Cables

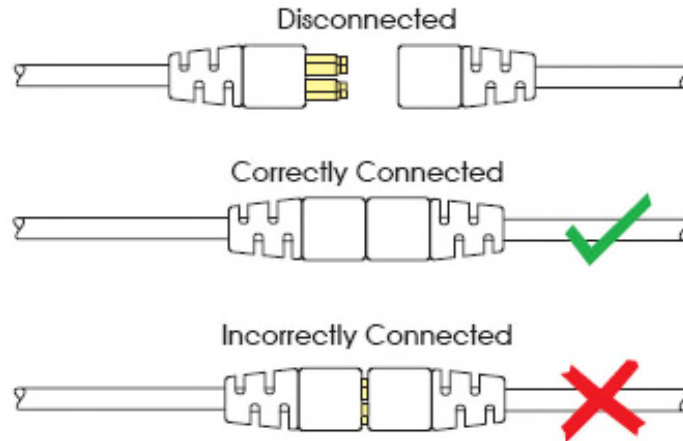
The cables to the different modules must be routed and secured in such a way as to prevent damage to them, for example by cutting or crushing. Contact HMC International NV if you need further advice.

### 3.5 RBI Wiring

The RBI is connected to the Power Module with a Communication Cable.

To connect the Communication Cables:

- Holding the connector housing, firmly push the connector into its mate until you can no longer see the yellow plastic. The connectors are secured using a friction system.



To disconnect the Communication Cables:

- Holding the connector housing firmly, pull the connectors apart.

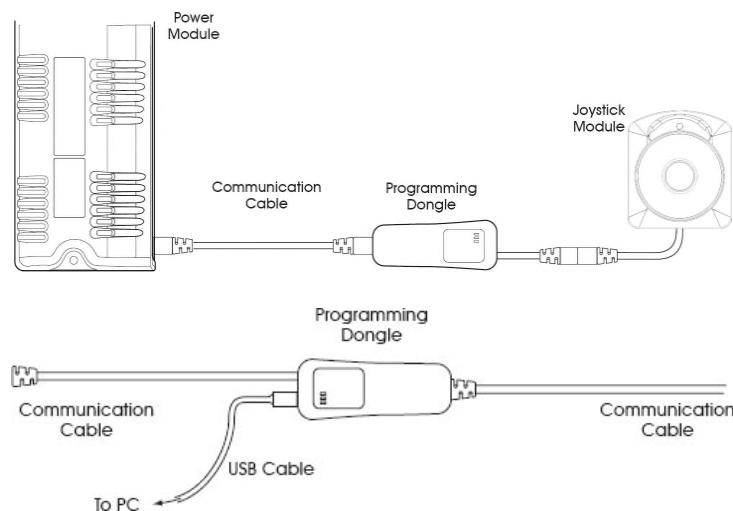
### 3.6 Power Module & ISM Wiring

We refer to the R-NET Control System Technical Manual – SK77981 – of PGDT.

### 3.7 Programming Connection

#### 3.7.1 PC Programming

To utilize the R-net PC Programming Suite the R-net Dongle must first be connected in the communications system as shown. A USB cable can then be connected between the Dongle and a PC with the R-Net PC Programmer installed. For further details on programming refer to Chapter 4.



### **3.8 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.**

#### **3.8.1 RBI**

- Check that the RBI is not bent or damaged.
- Check that the switches connected to the RNI return to the starting position when you push and release it.

#### **3.8.2 Test Drive**

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

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

The RBI 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.

### **3.10 Battery Gauge**

There is no battery gauge on the RBI. The battery gauge should be displayed by another unit in the system. Most of the time this will be the standard joystick of the system.

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# 4 Programming

## 4.1 Introduction

This chapter gives an overview of the programmable parameters within the R-Net control system related to the RBI. The R-Net can be programmed using a PGDT R-Net PC Programmer.

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

## 4.2 PC Programmer

For a complete list of all programmable parameters we refer to the R-NET Control System Technical Manual – SK77981 – of PGDT.

Here is the list with all parameters related to the RBI.

### Remote Buttons:

Global:

Control Axis while Driving      *Sets whether an axis can be operated while driving*

Latched Axis      *Sets whether an axis operates in latched mode*

Input X:

Assign      *Sets the type of operation*

Mode      *Sets the mode of operation*

### Module A and B:

It is possible to connect up to 2 RBI modules in the system. Each module has its own parameter settings. Adding a second module allow you to connect up to 12 switches.

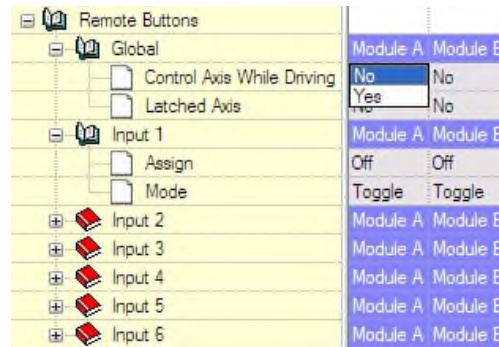
**IMPORTANT!** Module A is always the module with the lowest serial number.

#### 4.2.1 Control Axis while Driving: Default – No

Sets whether an axis can be operated while driving.

**No:** The wheelchair has to be in stand still before you can operate you axes.

**Yes:** Allows you to operate you axes while the wheelchair is driving.

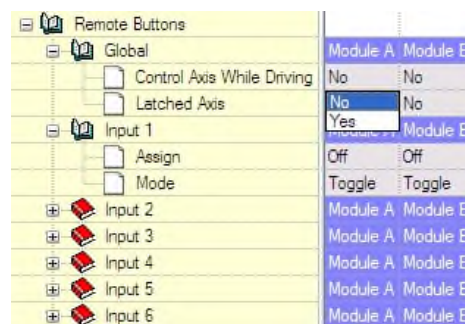


#### 4.2.2 Latched Axis: Default – No

Sets whether an axis operates in latched mode

**No:** Axes are not latched. They will operate as long as you press the switch.

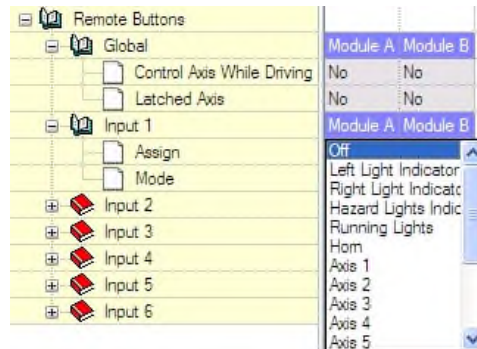
**Yes:** Axes are latched. A short press will operate the axis until you press it again.



### 4.2.3 Assign: Default – Off

*Sets the type of operation*

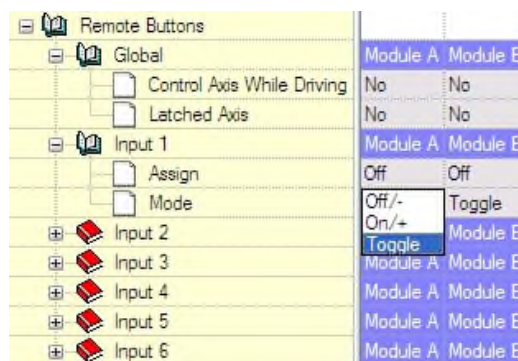
- Off:** No functionality is assigned to this switch.
- Left Light Indicator:** The switch will operate the left light indicator.
- Right Light Indicator:** The switch will operate the right light indicator.
- Hazard Lights Indicator:** The switch will operate the hazard lights indicator.
- Running Lights:** The switch will operate the running lights.
- Horn:** The switch will operate the horn.
- Axis 1..12:** The switch will operate the respective axes.



### 4.2.4 Mode: Default – Toggle

*Sets the mode of operation*

- Off/-:** The switch will turn off the lights or horn or the axis of actuators is contracting.
- On/+:** The switch will turn on the lights or horn or the axis of actuators is extending.
- Toggle:** The switch will toggle from on -> off or from + -> - or vice versa.



### 4.3 User Cases:

#### 4.3.1 General

The contents of this chapter will explain you, from a user point of view, how to deal with all parameters that are related to the RBI.

Depending on the use case more or less parameters must be changed. All these parameters will be grouped in a parameter subset file.

#### 4.3.2 User wants to operate his 3 axis of actuators while driving:

As we have 6 switches that can be connected we will choose to have a switch for each direction of axes.

Subset file:

Remote Buttons:		Module A	Module B
Global			
	Control Axis While Driving	Yes	No
	Latched Axis	No	No
Input 1		Module A	Module B
	Assign	Axis 1	Off
	Mode	Off/-	Toggle
Input 2		Module A	Module B
	Assign	Axis 2	Off
	Mode	Off/-	Toggle
Input 3		Module A	Module B
	Assign	Axis 3	Off
	Mode	Off/-	Toggle
Input 4		Module A	Module B
	Assign	Axis 1	Off
	Mode	On/+	Toggle
Input 5		Module A	Module B
	Assign	Axis 2	Off
	Mode	On/+	Toggle
Input 6		Module A	Module B
	Assign	Axis 3	Off
	Mode	On/+	Toggle

### 4.3.3 User wants to operate his 4 axis, left, right and hazard indicators and his running lights:

We will use 8 switches for the axis and 4 switches for the different lights. We will not allow the user to operate his axis while driving.

The user will still be able to operate his lights while driving.

Subset file:

Remote Buttons		
Global	Module A	Module B
Control Axis While Driving	No	No
Latched Axis	No	No
Input 1	Module A	Module B
Assign	Axis 1	Axis 4
Mode	Off/-	Off/-
Input 2	Module A	Module B
Assign	Axis 1	Axis 4
Mode	On/+	On/+
Input 3	Module A	Module B
Assign	Axis 2	Left Light Indicator
Mode	Off/-	Toggle
Input 4	Module A	Module B
Assign	Axis 2	Right Light Indicator
Mode	On/+	Toggle
Input 5	Module A	Module B
Assign	Axis 3	Hazard Lights Indicator
Mode	Off/-	Toggle
Input 6	Module A	Module B
Assign	Axis 3	Running Lights
Mode	On/+	Toggle

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