



# **DX-ACC4/4B**

## ***DX Switch Interface***

Installation manual




# About this Manual


This manual can help you understand and install the DYNAMIC DX-ACC4/4B Secondary Remote.

It describes the general principles, but it gives no guidelines for specific applications. If there is a specific requirement for your application, please contact Dynamic Controls or one of the sales and service agents to assist you.

The product is part of the DX System. This manual must be read together with the DX System Manual and all other relevant DX and DX2 component manuals.

In this manual, a few symbols will help you identify the purpose of the paragraph that follows:

	<p><b>Notes &amp; Precautions:</b></p> <p>Notes provide supporting information in order to install, configure, and use the product. Not following the instructions given in notes or precautions can lead to equipment failure.</p>
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	<p><b>Warnings:</b></p> <p>Warnings provide important information that <b>must</b> be followed in order to install, configure, and use the product safely and efficiently. Not following the instructions given in a warning can potentially lead to equipment failure, damage to surrounding property, injury or death.</p>
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The term '**programming**' used in this manual refers to adjusting parameters and configuring options to suit an application. 'Programming' does not change or alter any software within the controller and is performed using a controlled programming tool available only to authorised personnel.

The term '**accessory**' used in this manual refers to equipment that is ancillary to the main functioning of the DX System. It does not refer to an accessory of the powerchair. The DX System is a component of the powerchair.

The DX System is not user serviceable. Specialised tools are necessary for the repair of any component.

Do not install, maintain or operate this equipment without reading, understanding and following this manual – including the Safety and Misuse Warnings – otherwise injury or damage may result. This manual contains integration, set-up, operating environment, test and maintenance information needed in order to ensure reliable and safe use of the product.

Due to continuous product improvement, DYNAMIC reserves the right to update this manual. This manual supersedes all previous issues, which must no longer be used.

DYNAMIC reserves the right to change the product without notification.

Any attempt to gain access to or in any way abuse the electronic components and associated assemblies that make up the powerchair system renders the manufacturer's warranty void and the manufacturer free from liability.

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# 1 Introduction to the DX Switch Interface



The DX Switch Interface enables a user to control a wheelchair using four momentary type switches (forward, reverse, left and right). The interface is compatible with a wide variety of switch types, including custom built and 'off -the-shelf' switches.

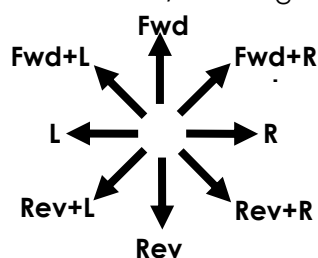
The DX Switch Interface is a DX RJM-type **Secondary Remote**. A DX Secondary Remote must be added to a DX system that has a DX Power Module and a DX Master Remote installed. Secondary Remotes do not replace the DX Master Remote. For more information, see the DX System Manual chapter 6.

**Note:**  
The DX Switch Interface is part of the DX System. Read the DX System Manual (DSM) before reading this manual.

Two variants are available:

Variant	Description
DX-ACC4	4 direction switches
DX-ACC4B	4 direction switches 1 mode switch 12V, 50 mA output

The four direction switches on the DX-ACC4/4B can generate eight driving directions.



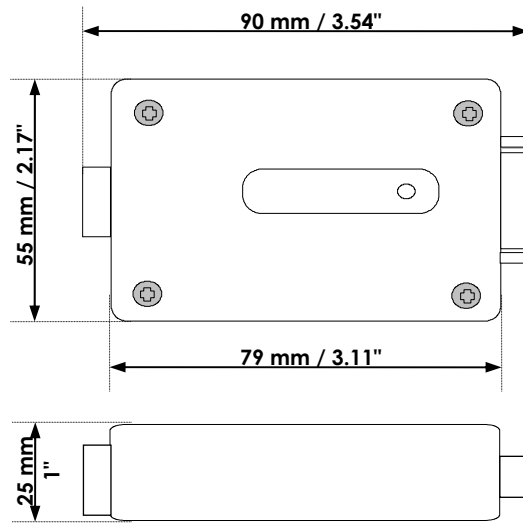
Because this remote is a switched device, the speed cannot be controlled with the joystick position. Adjust the acceleration and deceleration settings (see DSM section 5.3) to compensate for the absence of speed control.

The **mode switch** on the DX-ACC4B sends a 'DX Profile Up' signal to the Master Remote. Normally this will increase the Drive Profile by 1. However, it is dependent on the Master Remote how this signal is used exactly. For example, some Master Remotes also allow selection of seating with this signal. See the installation manual of the installed Master Remote for more details.

The DX Switch Interface can be used to operate lighting, seating, computer interface and environmental control by adding the relevant DX modules.

**Note:**  
The DX-ACC4B has a 12 Volt output on its DB9 connector (see 3.2). Before you connect a switch device to the DX-ACC4B, make sure that the switch device is compatible with this configuration.

## 2 Specifications



Parameter	Min	Nom	Max	Units
<b>DX BUS</b>				
DX BUS Operating Voltage	18	24	32	V
Standby Current (Powered Off)		0.10	0.25	mA
Idle Current		28	40	mA
Operating current (one switch closed)		30	50	mA
Operating current (while 50 mA on 12V output)		78	100	mA
<b>12 V output (DX-ACC4B only)</b>				
Output Voltage	11.4	12	12.6	V
Output Current			50	mA
<b>Mechanical</b>				
Weight		120		g
Operating Temperature Range	-25 (-13)		50 (122)	°C (°F)
Storage Temperature Range	-40 (-40)		65 (149)	°C (°F)
Operating Humidity Range	0		90	%RH
DX BUS Connector Cycles		25		cycles
DB9 Connector Cycles		25		cycles
Material	aluminium alloy			




**Warnings:**

*The DX-ACC4/4B is not waterproof. If necessary, add a water shielding cover to protect the module from water entry as appropriate to the environment that the chair will be used in.*

*Make sure that the total power consumption of all modules in the DX System does not exceed the rated DX BUS current at any time. For details, see the installation manual of the Power Module that is used in the DX System.*



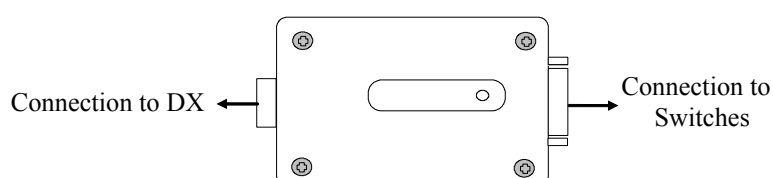
### 3 Installation



**Warning:**  
 Read the DX System installation procedure (DSM section 2.1) including the general wiring recommendations before installing the DX Switch Interface.

Install the DX Switch Interface as follows:

1. Mount the DX Switch Interface (see 3.1).
2. Connect the external switches to the DX Switch Interface (see 3.2).
3. Connect the DX Switch Interface to the DX system (see 3.3).
4. Set the **Joystick Source** parameter (see DSM chapter 5) to RJM instead of Master for each Drive Profile in which the DX Switch Interface will be used.
5. Set the **RJM has Analog Joystick** parameter to 'No'.  
 For more information on programming the DX System see DSM chapter 7.
6. Test the complete DX system for operation and safety (see 3.5).



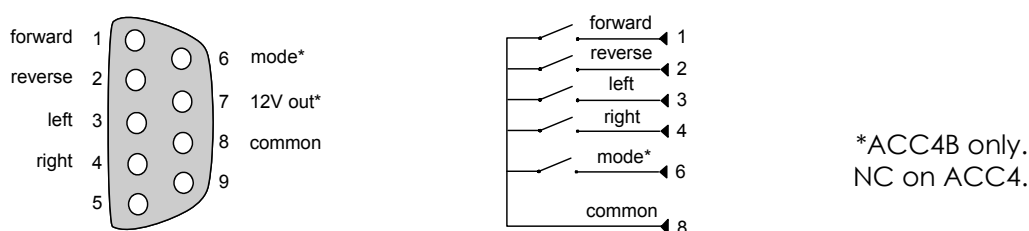
#### 3.1 Mounting

Mount the DX Switch Interface securely to the powerchair, with the drain hole facing down. The drain hole is on the bottom side of the DX-ACC4/4B (the top side is the side with the Module Status LED). The selected position and orientation must give maximum mechanical and environmental protection to the unit. Avoid positions in which the module or its wiring can be knocked or physically damaged. Avoid positions that are exposed to splashing and/or other forms of abuse.

Ideally the 'Status Light' indicator of the module should be viewable. If this LED flashes, the module is faulty and should be replaced.

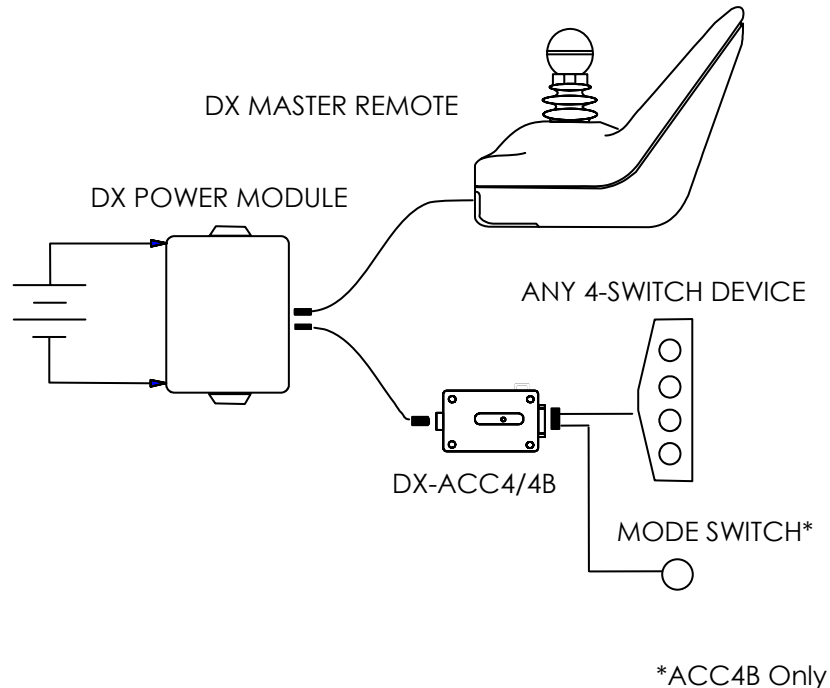
#### 3.2 Connection to external switches

Connect the external switches to the 9-pin sub-D connector according to the following wiring diagram.




### 3.3 Connection to the DX system

The DX Switch Interface is a DX **Secondary Remote**. It must be installed in a DX System that already has a DX **Power Module** and a DX **Master Remote**.



1. Make sure that the DX System is off.
2. Connect the DX Switch Interface with a DX BUS cable to a DX Module. This will usually be either the *DX Power Module* or the *DX Master Remote*, but it can be any other module with an available DX BUS socket.



**Note:**

*A DX BUS cable is not supplied with the DX Switch Interface and must be ordered separately. The correct length of the DX BUS cable is dependent on the position of the module to which the DX Switch Interface is connected.*

### 3.4 Programming

Set the **Joystick Source** parameter (see DSM 5.3.8.7) to RJM instead of Master for each Drive Profile in which the DX Switch Interface will be used. Set the **RJM has Analog Joystick** parameter to 'No'. For more information on programming the DX System see DSM chapter 7.

As a general guideline select RJM for Drive Profile 1,2 and 3, and Master for Drive Profile 4 and 5. This will activate use of the DX Switch Interface in the first three Drive Profiles, and the *Master Remote* (usually joystick operation) in Drive Profile 4 and 5. Drive Profile 4 and 5 can then be used either by an attendant, or as an alternative control for the user.



**Note:**

*If a Master Remote supports only one Drive Profile, install the DX Switch Interface in Drive Profile 1.*

### 3.5 Testing

Switch on the powerchair with the ON/OFF button on the Master Remote. If the DX Switch Interface is installed correctly, its Status LED will light up. If the Status LED flashes the module is faulty and must be replaced.

Select each Drive Profile with the Mode button of the Master Remote. Make sure that each Drive Profile operates with the correct control device, as programmed.

Always check the performance of the chair to ensure it can be used safely. In most cases the drive performance of the wheelchair should be slowed during initial training and use. This will give the user time to adapt to the change. In some cases permanent changes may be necessary.

Also check to make sure that the drive performance is satisfactory. The feel of the chair can change when using a new control device.



**Warning:**

*After the vehicle has been configured, check to make sure that the vehicle performs to the specifications entered in the programming procedure. If the vehicle does not perform to specifications, reprogram it. Repeat this procedure until the vehicle performs to specifications. If the intended operation cannot be achieved, contact your service agent.*

## 4 Appendices

### 4.1 *Intended Use and Regulatory Statement*

#### **Intended Use**

The DX-ACC4/4B is a module of a DX System intended to allow powered wheelchair users interaction with the DX System. The DX-ACC4/4B offers flexibility in integrating compatible input and output devices, as configured and connected, and provides extensive adaptability to meet specific user needs through optimal programmability.

The DX system is intended to operate powered wheelchairs utilising 24V motors with integrated parkbrakes.

The powerchair manufacturers are provided with the integration, set-up, operating environment, test and maintenance information needed to ensure reliable and safe use of the controller.

#### **Device Classification**

##### **Europe**

The DX-ACC4/4B is a component of a Class I medical device as detailed in the Council Directive 2007/47/EC concerning Medical Devices.

##### **USA**

The DX-ACC4/4B is a component of a Class II medical device (Powered Wheelchair) as detailed in 21 CFR § 890.3860.

Wheelchair Components are classified under 21 CFR § 890.3920 as Product Code KNN, Class I (General Controls), 510(k) exempt.

#### **Compliance and Conformance with Standards**

In accordance with the device classification, the DX-ACC4/4B is designed to enable the powerchair manufacturer to comply with the relevant requirements of the European Medical Device Directive 2007/47/EC and QSR 21 CFR § 820.

The DX-ACC4/4B has been designed such that the combination of the wheelchair and the DX Controller, along with accessories as applicable, complies with the Essential Requirements of the MDD by adopting relevant clauses of harmonised standards EN12184 and EN12182 and the FDA Consensus standard ANSI/RESNA 7176 for performance.

However, final compliance of the complete powerchair system with international and national standards is the responsibility of the powerchair manufacturer or installer.

## 4.2 Maintenance

1. Keep all DYNAMIC electronic components free of dust, dirt and liquids. To clean the product, use a cloth dampened with warm soapy water. Do not use chemicals, solvents or abrasive cleaners, as this may cause damage to the product.
2. Regularly check all vehicle components for loose, damaged or corroded components, such as connectors, terminals, or cables. Restrain all cables to protect them from damage. Replace damaged components.
3. Regularly test all switchable functions on the DYNAMIC electronics system to ensure they function correctly.
4. There are no user-serviceable parts in any DYNAMIC electronic component. Do not attempt to open any case or undertake any repairs, else warranty will be voided and the safety of the system may be compromised.
5. Where any doubt exists, consult your nearest service centre or agent.



**Warning:**

*If any component is damaged in any way, or if internal damage may have occurred (for example by being dropped), have it checked by qualified personnel before operating.*

## 4.3 Warranty

All equipment supplied by Dynamic Controls is warranted by the company to be free from faulty workmanship or materials. If any defect is found within the warranty period, the company will repair, or at its discretion replace, the equipment without charge for materials or labour.

This warranty is subject to the provisions that the equipment:

- has been correctly installed.
- has been thoroughly checked upon completion of installation, and all programmable options correctly adjusted for safe operation prior to use.
- has been used solely in accordance with this manual and the DX System Manual.
- has been properly connected to a suitable power supply in accordance with this manual and the DX System Manual.
- has not been subjected to misuse or accident, or been modified or repaired by any unauthorised personnel.
- has been used solely for the driving of electrically powered wheelchairs in accordance with the intended use and the recommendations of the wheelchair manufacturer.

## 4.4 Safety and Misuse Warnings

**The DX-ACC4/4B is a module of the DX System and therefore all safety and misuse warnings that appear in the DX System Manual apply to the DX-ACC4/4B as well. See DSM section 10.4.**

### **Additional warnings to be included in the User Manual**

The following warnings are applicable to the installer and must be passed on to the end-user before use of the product.

- In the case of an emergency while the vehicle is driving, press the On/Off button to perform an emergency stop and turn the system off.
- If operators of the vehicle are left with limited or no mobility because the vehicle loses electric power or breaks down, it is important that they can still call for assistance from wherever they may be.
- Do not store or operate the DX-ACC4/4B at a temperature that is outside the temperature ranges specified in this manual.

### **Service and Configuration Warnings**

The following warnings are applicable to the installer and therapist only.

- It is the responsibility of the OEM and installer to make sure that the maximum driving speed of the chair is limited as appropriate when the chair is in a mechanically unstable position, for example when the seat is raised.
- It is the responsibility of the therapist/ installer to minimize any risk of use error, including those arising from ergonomic features and/or the environment in which the device is intended to be used.
- The chair set up and configuration process should take into consideration the
  - technical knowledge, experience and education, and
  - medical and physical condition, including the level of disability and capability, of each individual user.
- Prior to handing over the vehicle, make sure that users are fully able to operate the product by giving them appropriate training on functionality and safety features, and having them test-drive the vehicle in a safe area in the presence of their agent.
- After maintenance or service of the chair, check the functional operation of all the switches that are connected to the DX-ACC4/4B.

## 4.5 Electromagnetic Compatibility (EMC)

DYNAMIC Electronic Controllers have been tested on typical vehicles to confirm compliance with the following appropriate EMC standards:

USA: ANSI/RESNA WC/Vol:2 - 1998 Sec 21

Europe: EN12184: 1999 Sec 9.8.1-3

National and international directives require confirmation of compliance on particular vehicles. Since EMC is dependent on a particular installation, each variation must be tested.

### Minimising emissions

To minimise emissions and to maximise the immunity to radiated fields and ESD, follow the general wiring recommendations in section 2.1.1 of the DX System Manual.

## 4.6 Environmental statement



This product has been supplied from an environmentally aware manufacturer.

Please be environmentally responsible and recycle this product at the end of its life through your local recycling facility.

This product may contain substances that could be harmful to the environment if disposed of into a landfill.

Do not dispose of this product in fire.

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Dynamic Controls is the world's leading manufacturer of electronic controls for power wheelchairs and scooters.  
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Regional centres are located in Europe, United States, Asia, and Australasia.

ISO 13485 certified –

DYNAMIC goes above and beyond industry standard expectations to ensure customers receive the best products possible.