



DX REMOTE JOYSTICK MODULE (RJM) INSTALLATION MANUAL

Important Notes !!

1. Read this Manual carefully before installing or operating your DX control system.
2. Due to continuous product improvement Dynamic reserves the right to update this Manual. This manual supersedes all previous issues which must not continue to be used.
3. *Any attempt to gain access to or in any way abuse the electronic components and associated assemblies that make up the wheelchair control system renders the Manufacturer's Warranty void and the Manufacturer free from liability.*

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IMPORTANT NOTE

The DX Installation Manual is written for use by the Wheelchair Manufacturer only. Where the wheelchair manufacturer produces a User's Manual, the text in *Italic Type* is the minimum recommended for inclusion in the User's Manual.

1.0 Introduction

The DX Remote Joystick Module (RJM) is a DXBUS compatible joystick that may be used for all functions that the normal "armrest" remote joystick supports (driving control, actuator control, etc). However its small size makes it especially ideal for applications such as tray, chin and head control.

Since it must always be used in conjunction with a conventional DXBUS computable armrest mounted remote it also makes possible "dual control" where either the RJM joystick or the armrest joystick may be used to control the chair depending on which drive program is selected.

The RJM has a "sleep" feature which relieves the user of the need to operate a mechanical switch for powering the chair control system up and down.

2.0 Related Documentation

A DX based wheelchair control system may comprise between two and sixteen DX compatible modules depending on the application. Each DX compatible Module has its own Installation Manual which describes the installation requirements of that particular Module.

This Manual must therefore be read in conjunction with the Installation Manuals for all other DX Modules to be used in your application.

ALL THE ABOVE MANUALS MUST BE READ AND UNDERSTOOD BEFORE COMMENCING INSTALLATION!!

3.0 Specifications

3.1 Controls / Indications / Features

- Installation Pre-requisites
Use of the RJM requires a DX Micro Board elsewhere in the DX system (this would normally be part of a standard "armrest" type remote).
- Driving Control
JS5 Flightlink dual decode joystick.
- RJM "Sleep" Power Down
The RJM has a programmable "sleep" timer that puts the system into a low power, safe "sleep" mode after a programmable period of RJM joystick inactivity. The system can be "woken up" by subsequent activation of the joystick (OONAPU applies for safety).
- Master DX System Power Control
Total DX system power control is by the POWER ON/OFF switch on the associated armrest remote (this overrides the RJM Sleep timeout).
- Programmable Options
Which drive program(s) the RJM is to be used on (PCD and HHP programmable).

If RJM joystick is to be normal or reverse (PCD programmable only)

RJM Sleep timeout (PCD programmable only)
- RJM Status LED
Indicates that the RJM is powered up and ready for use.
- DXBUS Connection
A light duty 2.0 metre cable terminated in a DXBUS plug for connection to the DXBUS at any convenient point. This can be extended if necessary as long as the maximum total DXBUS length of 15 metres is not exceeded.

3.2 Electrical

- Operating Voltage Range 18V to 32VDC
- RJM Power Consumption (when not in sleep) 2W max. at 24V (1.25W nominal)
- RJM Power Consumption (when in sleep) 10mW max. (1.2mW nominal)
- System Power Consumption (when in sleep) Typically 1.2W

3.3 Environmental

- Operating ambient temperature range -25 to 50E C
- Storage temperature range -25 to 70E C
- Operating and storage humidity 0 to 90 RH

Note : C 20 volts per metre (V/m) is a generally achievable and useful immunity level against EMI (the higher the level, the greater the protection).
C The immunity level of this product is not known.

3.4 Mechanical

- Layout/Dimensions As per Fig 1 below
- Construction Natural anodised aluminium extrusion, with black painted steel end cap.
- Weight 370gm
- Mounting Using custom brackets (refer Section 6.)

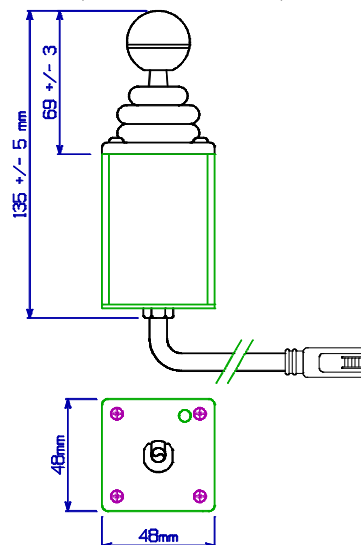


Fig 3.1: RJM Configuration

4.0 RJM Topology

The RJM is a "slave" device driven from a DX MicroBoard. While the Micro Board may be placed anywhere on the chair in any enclosure it will normally be most convenient simply to use a standard "armrest" remote as the RJM driving device.

To summarise, the RJM is not a replacement for a DX "armrest" type Remote, it is an addition to it, as below

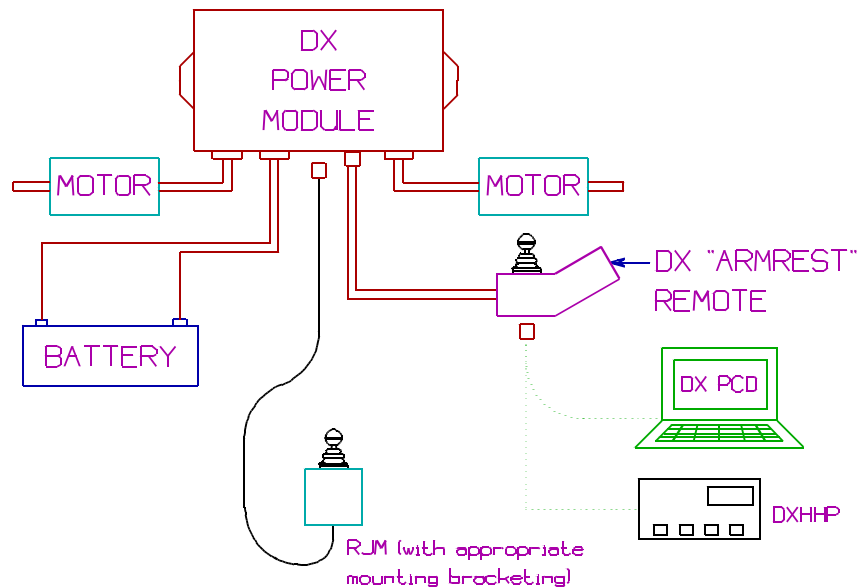


Fig 4.1 DX RJM/Remote Topology.

This arrangement gives the following benefits

- 1) All other normal remote facilities are still available at all times. For instance, the fuel gauge, actuator controls, drive program selection controls, programmer socket, battery charger socket, etc, are all available for use by the carer.
- 2) The RJM can be as small as possible since it does not have to house the relatively large Micro Board that is necessary for DX operation (this exists in the normal armrest remote)
- 3) Dual control is possible. The user input for each of the five drive programs can be defined to be either the RJM or the normal armrest remote joystick. If so programmed the user can transfer control between the two joysticks simply by changing drive programs.

5.0 RJM Operation

5.1 Drive Control

Any or all of the DX's five drive programs can be defined (by HHP or PCD) as being controlled by either the RJM or the armrest remote joystick.

When a drive program that specifies the RJM as the input device is selected, drive control is automatically transferred from the armrest joystick to the RJM. "OONAPU" (Out Of Neutral At Power Up) applies so that if the RJM joystick is deflected at the time of changeover no action occurs until the RJM is returned to neutral. If the RJM OONAPU condition is sustained for more than three seconds the DX system will enter the DX Module Fault (Flash Code 1) fault state.

5.2 Sleep Mode Operation

An optional (PCD selectable) "sleep" feature is available, which operates as follows. When a drive program that specifies the RJM as the current input device is selected a "sleep" timer is started. This timer is re-set to zero every time the RJM joystick moves out of neutral. If there is no joystick activity for greater than the pre-programmed period, the DX system enters a "Sleep" mode in which all DX modules are powered down, with the exception of the armrest remote and RJM. The armrest remote turns off all displays but remains in a low power state monitoring the RJM for any joystick activity.

Detection of new RJM joystick activity turns the DX system back on but will not immediately cause the chair to action the joystick deflection. The joystick has to be returned to neutral before RJM joystick commands are accepted as normal drive input.

6.0 RJM Installation

6.1 Compatibility with Power Wheelchairs

The model DX Series power wheelchair controller will function on those wheelchairs equipped with the following specifications:

- C Motor resistance from 0 to 0.5 ohms;
- C Motor voltage from 20V to 30V;
- C Batteries greater than 20Ahr lead acid;
- C Peak motor current 60A - 80A max. per motor output (model dependant);
- C 12V or 24V parking brake;

(Note: 12V motors can be used if the controller is programmed to half speed)

Note : This controller is not designed for use with specialty type power wheelchairs, such as stair climbing wheelchairs or stand up wheelchairs.

6.2 Mounting

Mounting bracketry will normally be designed and manufactured by the wheelchair manufacturer to suit the application and chair type. The normal interface of any bracket to the RJM is using some or all of either the four bottom plate mounting screws, or the four joystick mounting screws.

6.3 Connection to the DXBUS

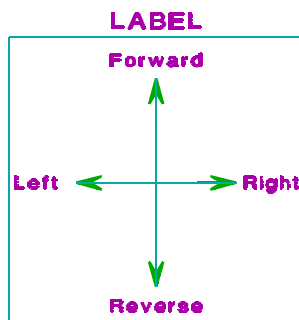
Plug the RJM's DXBUS plug securely into any spare DXBUS socket and secure the cable to the chair frame.

6.4 Joystick Orientation.

The "forward" position is always towards the RJM label (defined by the flat on the restrictor plate if fitted)

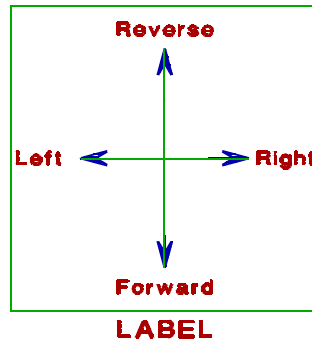
Two alternative joystick direction interpretations are possible depending on whether the PCD programmable "Reverse RJM J stick" has been set to "NORM" or "REV", as follows.

a) "Reverse RJM J Stick" set to NORM (Tray Control)



b) "Reverse RJM J Stick" set to REV (Chin Control)

This reverses the interpretation of left and right joystick deflections so that when the joystick is rotated 180 degrees (label facing back) to maintain the restrictor plate in the correct position correct interpretation of left and right deflections are preserved.



7.0 Programming

WARNING:

1. IT IS POSSIBLE BY INCORRECT OR INAPPROPRIATE PROGRAMMING TO PUT THE CHAIR INTO A DANGEROUS STATE. DYNAMIC CONTROLS LTD ACCEPT NO RESPONSIBILITY OR LIABILITY FOR ACCIDENTS CAUSED BY INCORRECT PROGRAMMING. READ THIS SECTION, WITH THE HHP AND PCD MANUAL THOROUGHLY BEFORE ATTEMPTING TO PROGRAM A DX SYSTEM !!

2. ENSURE THAT THE CHAIR AS PROGRAMMED COMPLIES WITH ALL PREVAILING REGULATORY REQUIREMENTS FOR YOUR COUNTRY AND APPLICATION.

7.1 RJM Programmable Parameters

The RJM has the following associated programmable parameters. All are PCD adjustable, some are HHP adjustable as shown.

Parameter	HHP Programmable ?
Remote Joystick	Yes
Sleep Timeout	
Reverse RJM J Stick	
Sleep Mode Enable	

Parameter descriptions are as follows....

a) REMOTE JOYSTICK (LOCAL/REM, PCD/HHP programmable)

This is set for each of the drive programs supported by the remote used. A drive program with it's REMOTE JOYSTICK option set to LOCAL will use the armrest joystick as it's input device while a drive program with it's REMOTE JOYSTICK option set to REM will use the RJM joystick as it's input device. This facilitates implementation of "dual" control systems in which changing between joysticks is as simple as selecting another drive program.

b) SLEEP TIMEOUT (1 - 15 Minutes, PCD programmable only)

Sets the sleep timeout if the SLEEP MODE ENABLE option is selected. The DX system will power down to a low power state if there is no joystick activity for longer than the set timeout. All modules other than the remote and the RJM will be powered down and all remote displays will be turned off, although depending on the remote type there a single LED may be left on to indicate the system is in sleep mode. (Refer to the appropriate Remote Installation Manual for details).

c) REVERSE RJM J STICK (NORM/REV, PCD programmable only)

Reverses the interpretation of "left" and "right" joystick deflection, as described in 6.3).

d) SLEEP MODE ENABLE (DIS/EN, PCD programmable only)

Select "EN" if the sleep feature is required. Note that when enabled, the sleep feature applies to all drive programs, whether the input device for that program is the RJM or not.

8.0 Diagnostics

In the case of incorrect or non operation of the RJM check...

- 1) The RJM's STATUS LED is ON steady - if it is flashing, or is OFF when the system is turned ON, the RJM is faulty.

Note that unlike other DX Modules the RJM is a "dumb" device and is not able to detect and indicate all possible faults.

- 2) Check the DXBUS cable is not damaged and is securely plugged in.
- 3) Check that the DX system has been programmed with the correct RJM related parameter values.

Some RJM faults also result in a "DX Module Fault" (Flash Code 1) on the User Remote's SYSTEM STATUS LED. These include joystick faults and loss of communication when a drive program that uses an RJM is currently selected.

9.0 Maintenance

1. *The DX control system should be regularly checked for integrity. Loose, damaged or corroded connectors or terminals, or damaged cabling should be replaced.*
2. *All switchable functions on the DX control system should be regularly tested to ensure they function correctly.*
3. *All DX system components should be kept free of dust, dirt and liquids. If necessary wipe with a cloth dampened with warm water or alcohol. DO NOT use solvents.*
4. *Where any doubt exists consult your nearest Service Centre or Agent.*
5. *There are no user-serviceable parts in any DX system component - do not attempt to open any case.*

WARNING

If any DX 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.

10.0 Service Centres

Further information and assistance can be obtained from...

Dynamic Controls Limited (Head Office)

Print Place, PO Box 1866, Christchurch, New Zealand

Tel: International 64 3 338-0016

Fax: International 64 3 338-3212

EUROPE

Controls Dynamic Limited

Controls Dynamic Ltd, Lisle Avenue, Kidderminster, DY11 7DL, United Kingdom

Tel: International 44 1562 820 055

Fax: International 44 1562 742 720

NORTH AMERICA

Rosstron Inc

1521 W. 259th Street, Harbor City, CA 90710, USA

Tel: International 1 310 539-6293

Fax: International 1 310 539-4078

The controller should be clearly labelled with the manufacturer's service agent's telephone number.

11.0 Safety and Misuse Warnings

You should read and understand all the warnings throughout this Manual and heed them - if in doubt ask for advice.

This DX component must not be used other than in the manner described in this Manual.

The completed installation must be thoroughly checked, and all programmable options must be correctly adjusted for safe operation prior to use.

A warning must be conveyed to the chair operator that the controller could cause the chair to come to a sudden stop. In situations where this may effect user safety this will require the fitting and wearing of a seat belt.

The DX control system is fully programmable to optimise performance and safety. Do not operate the chair unless you have full control. Ensure that the chair is correctly programmed for your needs and environment and ask your dealer to adjust if necessary. Always choose a drive program that you feel safe with and that is compatible with your environment.

Do not operate the DX system if it behaves erratically, or shows abnormal response, heating, smoke or arcing. Turn the system off at once and consult your Service Agent.

Do not operate your DX system if the battery is nearly flat, as a dangerous situation may result due to loss of power in an inopportune place.

Ensure the controller is turned off when not in use.

No connector pins should be touched, as contamination or damage due to electrostatic discharge may result.

Most electronic equipment is influenced by Radio Frequency Interference (RFI). Caution should be exercised with regard to the use of portable communications equipment in the area around such equipment. If RFI causes erratic behaviour, shut the wheelchair off immediately. Leave off while transmission is in progress.

Report any malfunctions immediately to your Service Agent.