

DYNAMICTM

DXTM *Modular Mobility System*

**DX-ACU3
Installation Manual
(GBK60064)**



Master Remote

Important Notes :

Read this Manual carefully before installing or operating your DX control system.

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.

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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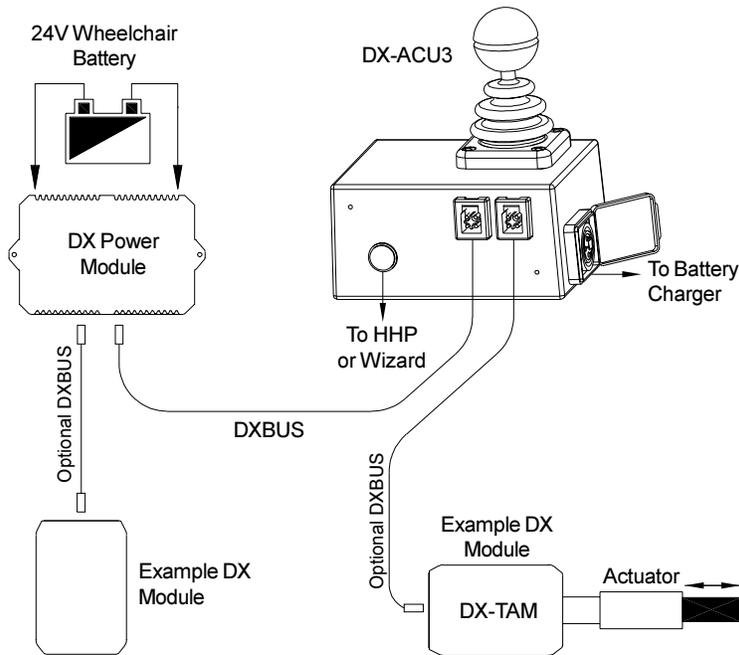
1 Introduction

The DX-ACU3 is a primary DX compatible Remote. Up to five individual Drive Programs (or profiles) are available, and the currently selected Drive Program is displayed on a 7-segment display. The DX-ACU3 has a battery gauge, two standard DXBUS connectors for connection to the DX System, an XLR type charger socket and a DX Programming socket.

The DX-ACU3 and the associated DX Power Module are fully programmable to cater for a wide range of wheelchair types and user needs. Correct installation and programming are essential to ensure optimum performance and safety.

This manual and others listed on the next page must be read and understood. For more information, please contact a Sales and Service agent.

Example DX System



2 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 describes installation of the DX-ACU3 and its variants only and must therefore be read in conjunction with the :

- DX Power Module (PMB) Installation Manual;
- DX Hand Held Programmer (HHP) Manual;
- Dynamic Wizard Installation Sheet or Online Help;
- Installation Manuals for all other DX Modules to be used in your application.

Dynamic Controls Ltd. welcomes feedback from its customers on its products and documentation. If you would like to comment on this manual or the product it describes, please contact us at any of the addresses at the back of this manual, or by email at:

administrator@dynamic-controls.co.nz

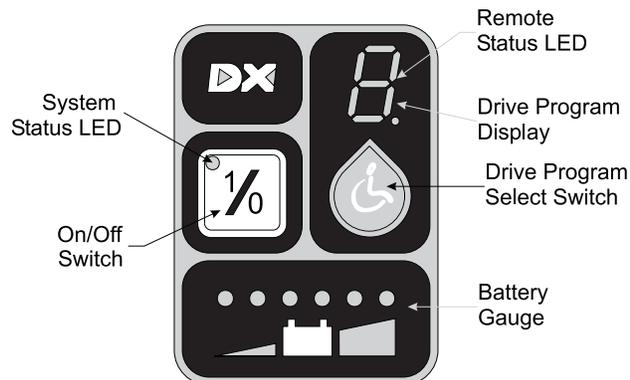
Installation Manual Re-order Information
(Please quote this information when re-ordering this manual)

DX-ACU3 Installation Manual - GBK60064

3 Features

- Joystick** Normally used for controlling wheelchair speed and direction.
- On / Off Switch** Toggles the entire DX control system On and Off.
- System Status LED** The System Status LED indicates the On / Off status of the system. It also flashes to indicate system faults. (Refer to Diagnostics section 9 for Fault Codes details.)
- Remote Status LED** The Remote Status is indicated by the 7-segment display. The entire display will flash if there is a fault within the DX-ACU3.
- Battery Gauge** Battery charge level is indicated by a set of six LEDs. These are arranged in a line from left to right as two red, two orange, and two green.
- Drive Program Select Switch** A switch is used to cycle through and select one of the five Drive Programs.
- Drive Program Display** The currently selected Drive Program is indicated by the 7-segment display. It will also display Drive Inhibit.
- Program Socket HHP / Wizard** A standard HHP / Wizard programming socket.
- Standard DXBUS Connection (x2)** For connecting the DX Remote via a DXBUS cable to other DX compatible modules.
- Battery Charger Socket** Standard 3 pin XLR type battery charger socket. Refer to the Batteries and Battery Charging section for pin details.

Fully Functional Keypad



4 Specifications

Electrical

Compatible with standard DXBUS

Operating voltage range 18V - 32 V dc

Charger rating 12 A RMS continuous, limited by DXBUS rating.

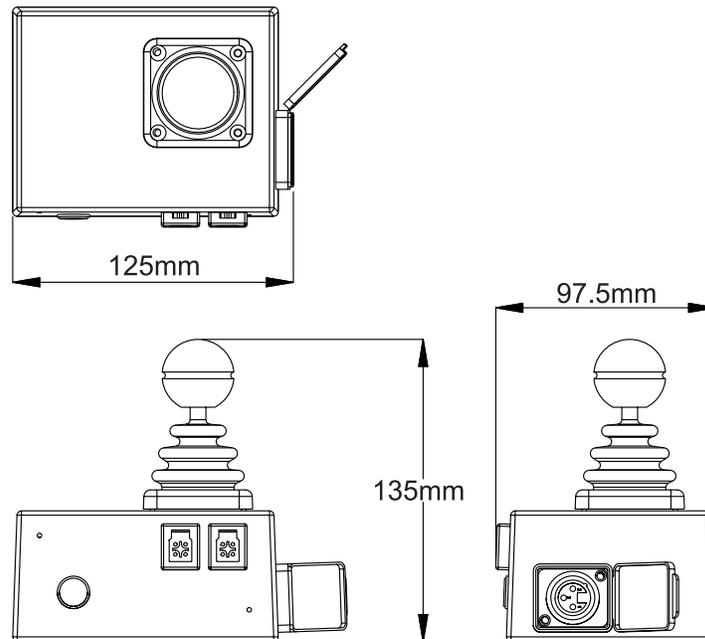
Quiescent Current <1mA Off, typically 100mA On

Mechanical

Weight: 0.59 Kg

Mounting: As per 'Installation - Mounting' section

Case material: Aluminium



Environmental

Parameter	Min	Max	Units
Operating ambient temperature range	-25	50	°C
Storage temperature range	-25	70	°C
Operating and storage humidity	0	90	%RH

Compliances

EN1284 (1999E)

ISO7176

EMC: ESD tested to IEC 61000-4-2

EMS tested to IEC 61000-4-3 (Option of 16V/m)

EME tested to EN55022:1998

5 Operation

Compatibility with Power Wheelchairs

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

- Motor resistance from 0 to 0.5 ohms;
- Motor voltage from 20V to 30V;
- Batteries greater than 20Ah lead acid;
- Peak motor current 60A-80A maximum per motor output (model dependant);
- 12V or 24V Park Brake;

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

On / Off

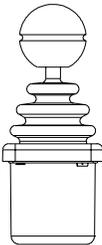


The On/Off switch toggles the system power on or off.

Warning : Do not attempt to drive the DX-ACU3 until there is a number visible on the Drive Program Display e.g.



Joystick OONAPU



The DX-ACU3 features Out Of Neutral At Power Up (OONAPU) detection. If the system is powered up while the joystick is not in the neutral position, the System Status LED flashes rapidly for either as long as the condition persists, or for a maximum of 5 seconds. If the condition persists for longer than 5 seconds, a DX Module Fault (Flash Code 1) is signalled on the System Status LED, and the 7-segment display flashes. This is a latching fault and must be cleared by powering the system down and up again (with the joystick in neutral).

Drive Program Selection and Display

The DX-ACU3 can offer up to five different Driving Programs, depending on its configuration (see Programming section).

Drive Program Selection



Drive Programs can be selected by pressing the Drive Program Select Switch. Pressing this switch will increment the Drive Program number up to the maximum configured value. A further switch press will return the DX-ACU3 to Drive Program 1.

Drive Program Display



The current Drive Program number or actuator selected is displayed on the 7-segment Drive Program Display.

Drive Inhibit Display



A '-' is displayed on the Drive Program Display whenever the DX System is in Drive Inhibit state, e.g. during battery charging, some operation of actuators, active Stop Switch (CLAM or TAM).

Remote Status Display



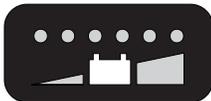
The Remote Module Status is displayed by the 7-segment Drive Program display. The currently displayed code will flash if there is an internal DX Remote fault, or if an OONAPU fault has occurred.

System Status Display



The System Status LED is displayed above the On / Off switch. This LED is lit if the system is turned on. It also flashes in groups called Flash Codes, to indicate system faults. For Flash Code details, refer to the later Diagnostics and Fault Finding section.

Battery Gauge Display



Battery charge level is continuously indicated by a set of six LED's. These are arranged in a line from left to right as two red, two orange and two green.

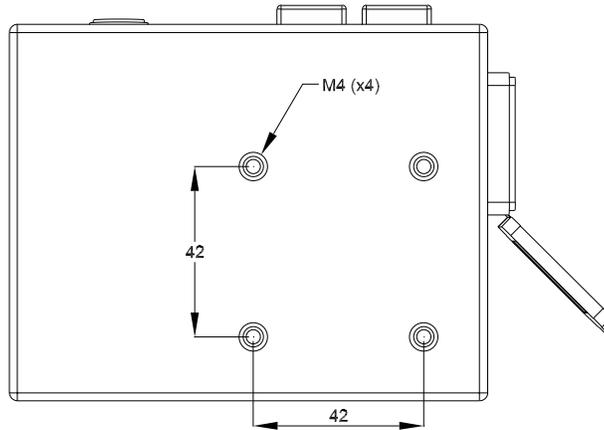
The Battery Gauge provides true, useable battery capacity information, and indicates other related battery conditions. Full battery capacity is indicated by all six LEDs on.

6 Installation and Testing

DX-ACU3 Mounting

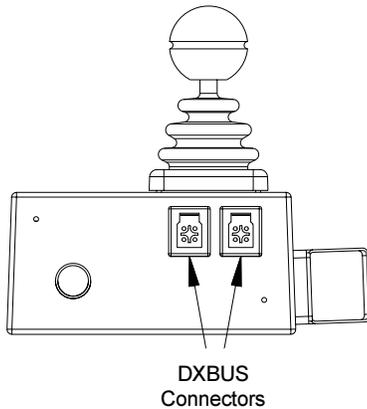
The DX-ACU3 Remote can either be mounted on the rear of the wheelchair in an upright position using four M4 screws, or on a bracket at the front of the chair, on the left or right side.

Warning : For safe installation, select a screw length that protrudes between 4mm and 10mm into the case.



Note : If the programmer socket needs to be accessible when the DX Remote is mounted, make allowance for this prior to fitting.

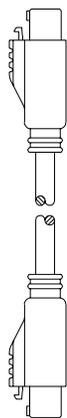
DX-ACU3 Connection with the DX System



The DX-ACU3 has two DXBUS connectors which enables any DXBUS cable to be used to interconnect it to the remainder of the DX system.

The DX-ACU3 will normally be connected directly to one of the two DX Power Module DXBUS connectors.

Note : If only one DXBUS connector is used on the DX-ACU3 and the remaining connector is accessible to the wheelchair user, a dummy connector should be fitted to the unused connector. This will comply with ISO7176.



DXBUS cables are available in the following lengths :

DXBUS CABLE, Straight, 0.3 M	Part/Order Number GSM63003
DXBUS CABLE, Straight, 0.5 M	Part/Order Number GSM63005
DXBUS CABLE, Straight, 1.0 M	Part/Order Number GSM63010
DXBUS CABLE, Straight, 1.5 M	Part/Order Number GSM63015
DXBUS CABLE, Straight, 2.0 M	Part/Order Number GSM63020

DXBUS cables are also available fitted with a ferrite bead to improve Electromagnetic Compatibility (EMC).

DXBUS CABLE, Ferrite, 2.0 M	Part/Order Number GSM63020F
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Warning : Any protruding screws should be either plastic or plastic coated to prevent short circuits occurring with the DXBUS Cable pins.

Testing

Ensure that all DX Modules used in your DX System have been installed as specified in their Installation Manuals. The DX-ACU3 needs to be correctly programmed for the appropriate wheelchair prior to testing.

A DX Remote contains the complete wheelchair system set up, from which all DX Modules download their relevant information when the DX System is first turned on. Refer to the later Auto Download section.

Power Up Response

Power up the remote by pressing the On/Off switch. The power up response for the DX-ACU3 is :

- The System Status LED will come on steady.
- At least one of the LEDs on the Battery gauge will be on.
- The Mode display will indicate a number from 1 - 5.

Note : The first time the DX-ACU3 is turned on, the System Status LED will flash a fault. This is because the DX-ACU3 must download its information to the DX Power Module. Turn the DX-ACU3 off then on to clear this fault. Refer to the later Auto Download section.

DX-ACU3 Check Sequence

Perform the following DX-ACU3 check sequence :

- 1 Press the On/Off switch again and check the Power LED turns off. Press it again to turn it on.
- 2 Press the Drive Program select switch a number of times. Check that the display changes as expected.
- 3 Perform the remainder of the tests as outlined in the Testing sections of the Installation Manuals of all other DX Modules used on the wheelchair.

7 Batteries and Charging

Battery Type

The DX System is designed to perform optimally with either Lead-Acid or Gel Cell 24 V deep cycle batteries, rated at 20 - 120 Amp hours. The maximum average discharge rate must not exceed half the rated capacity, in Amp hours.

High continuous discharge rates dramatically reduces the available battery capacity. For example, at a discharge rate equal to the rated capacity, the available capacity is 50 - 60 %. At a discharge rate of half the rated capacity, the available capacity is 70 - 80 %.

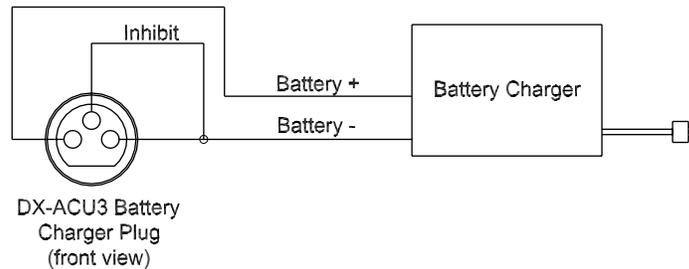
A wheelchair that draws maximum average battery current of 20 A, requires a battery of at least 40 Amp hours. A battery of only 20 Amp-hours, would begin to suffer a drop in performance at about half of its available capacity. The 40 Amp hour battery would have a full performance range of 4.5 times greater than the 20 Amp hour battery; a 80 Amp hour battery would only increase this range by 2.5 when compared to a 40 Amp hour battery.

Battery Charging

The satisfactory performance of the DX system is critically dependent on the type and state of the batteries. The battery charger used must be correctly selected and adjusted according to the battery manufacturer's instructions. Failure to do so may damage or destroy the batteries, give poor range, or be potentially dangerous. Batteries should not be abused (for example by deep discharging or overcharging) and must be operated and maintained according to the manufacturer's instructions.

The battery charger socket is a 3 pin XLR type with pin configuration as shown below. Ensure that the charger used is compatible with this pin out before connection. The safety link between B- and the Inhibit pin must be fitted so that the wheelchair is prevented from driving when the batteries are being charged. The Drive Program will show ' 

Warning : Do not disconnect batteries or open circuit the circuit breaker during charging. This is dangerous to both people and equipment.



Note : The inhibit is shorted to B- external to the DX-RemG80.

Connection of the battery charger will automatically power the wheelchair, if the wheelchair was powered down at the time of connection. This allows the progress of battery charging to be monitored on the DX-ACU3 battery gauge. The wheelchair can, if required, be subsequently powered down by pressing the On/Off switch, and charging will still proceed normally.

Battery Gauge

The Battery Gauge provides true, useable battery capacity information. A full battery with at least 85 % of rated capacity, is represented by all LED's lit. Some new batteries can start with as little as 80% capacity, developing higher capacity in their early life (sometimes up to 110%), before slowly deteriorating over their rated life.

As the battery voltage drops, the number of LEDs lit reduces from right to left. When only the red LEDs are lit, the available battery capacity is typically less than 10 %. At this level and below, the Battery Gauge flashes at 1 flash per second to alert the user that the wheelchair is running on reserve capacity. The battery capacity will reduce more rapidly in the reserve capacity range.

Battery Saver

The Battery Saver is a feature programmed into the DX Remote. When the battery capacity drops below 21V to the reserve range (only two red LEDs lit), the wheelchair performance is reduced. This is to preserve the life of the battery by encouraging the user to recharge the battery before it becomes harmfully flat.

Operating the wheelchair with more than two LEDs of the Battery Gauge lit will generally give normal wheelchair performance. This is provided that the battery size and the Power Module program settings are matched to the wheelchair.

Battery Condition Warnings

A battery warning is shown by the Battery Gauge flashing its LEDs, the number of which depends on what it currently has lit.

Battery High Warning Condition

This condition occurs when the battery voltage exceeds 28V, as measured by the Power Module.

The cause can be :

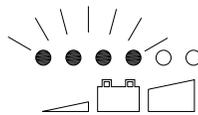
- The wheelchair is still on charge and the batteries are full or faulty.
- The batteries are overcharged.
- The wheelchair is travelling down a slope and the batteries are full or faulty.

The wheelchair will drive during this warning condition which will reset automatically when the battery voltage drops below 28V.

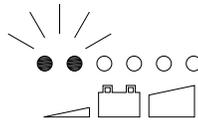
Battery Low Warning Condition

This condition occurs when the battery voltage drops below 23.3V, when the joystick is in neutral.

The cause can be :



If the Battery Gauge flashes with orange or green LEDs lit, but the cause is not due to a Battery High warning condition, the battery or battery wiring may be faulty.



If the Battery Gauge flashes with just the left 2 or 3 LEDs after stopping the wheelchair, the battery may be too small for the wheelchair type, or the battery may be old or damaged.

The wheelchair will drive during this fault condition, but the flashing will continue until the joystick is returned to neutral again.

A Battery Low warning normally coincides with a Low Capacity warning.

Low Capacity Warning Condition

When the calculated available battery capacity drops below 10% of full capacity the two left most red LEDs flash.

The wheelchair will drive during this fault condition but it shows that the battery is in the reserve capacity range and battery capacity will begin to reduce rapidly. The Low Capacity warning will not stop until the batteries have been recharged adequately.

8 Programming

Warning!!

Incorrect or inappropriate programming of a DX System can put the wheelchair into a dangerous state. Dynamic Controls accept no responsibility or liability for accidents caused by incorrect programming. This Programming section, the DX-HHP Manual, and the Dynamic Wizard Installation Sheet / Online Help must be read and understood before attempting to program a DX System.

Ensure that the programmed wheelchair complies with all prevailing regulatory requirements for your country and application.

Introduction

The driving performance of the DX System is dependant on its programming. Different features can be selected and parameters fine tuned for a particular application, or to suit the requirements of an individual.

The DX Remote and the DX Power Module are the modules most responsible for defining the driving performance of the DX System. Software in the DX Remote processes the joystick movements according to its Drive Programs, and sends direction and speed commands to the Power Module.

Default Programs

The DX-ACU3 is programmed during manufacturing with a set of factory default settings which are incorporated into a controlled document by Dynamic. The default settings programmed into a DX-ACU3 will not be suitable for all DX Systems and must be checked and reprogrammed prior to connecting with a DX System. The optimum settings for all programmable DX Modules are determined by the wheelchair manufacturer (OEM). If more than one type of wheelchair is to be used by the customer, each wheelchair type may have its own set of optimum settings.

Warning : If a wheelchair is programmed with settings other than default, under some very rare fault conditions default settings could be automatically restored, thereby changing driving characteristics. This in turn could lead to a chair moving in a direction or speed that is not intended. Programmers should consider this risk when programming settings other than default.

Auto Download

The DX System has a feature called Auto Download. It is designed to minimise the programming requirements associated with Module servicing by downloading the correct programming to a replacement DX Module.

When a DX Module is replaced, it is likely that the replacement module is programmed differently from the one that it replaces. This could leave the wheelchair in a dangerous condition. The DX System automatically detects that a DX Module swap has occurred, and the programmed data from the old module is transferred to the replacement module.

Auto Download is achieved by the DX Remote containing both its own programming and also a backup copy of the programmed data for all other DX Modules. When a module swap is detected, or a checksum error found in a module, the DX Remote automatically downloads its backup copy to the module. The Auto Download occurs immediately on power up after the Module has been replaced. This applies to all DX Modules except a DX Remote.

Warning : When a DX-ACU3 is replaced it will perform an Auto Download to all DX Modules. This may result in incorrect and dangerous programming for a particular wheelchair system if the wheelchair program installed in the DX-ACU3 is not suitable for that wheelchair system.

Do not attempt to drive or test the DX System before the correct and suitable wheelchair program has been installed in the DX-ACU3 using the Wizard.

The DX-ACU3 can be programmed with the Wizard using a 'dummy' DX System and/or a 24V power supply, or on the wheelchair provided driving is prevented e.g. by disengaging the drive wheels.

After replacing any DX Module, turn the DX System off, then on again, to initiate the Auto Download of the DX Remote backup data. When an Auto Download has occurred, but the system needs to be cycled on and off, a Module Fault (Flash Code 1) is displayed on the DX Remote's System Status LED and also the Status LED of the offending module. When the System is turned off then on again, the fault is cleared and the Auto Download is correctly terminated.

Programming Tools

Two programming tools are available, the Dynamic Wizard and the HHP.

Dynamic Wizard

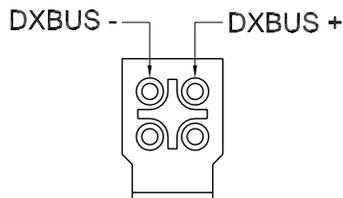
The Wizard is a PC based tool suited to programming production runs of identical wheelchairs or modules, or individual highly customised wheelchairs. The Wizard is available in several versions :

- | | |
|------------------------|--|
| OEM | Generally used by the wheelchair manufacturer. Able to program a wide range of parameters. |
| Dealer | Similar in function to above, but with a reduced range of programmable options. This ensures that options that the manufacturer wishes to keep control of cannot be disturbed. Parameters that may cause hazards or require special expertise to be set are not available to adjust. |
| Enhanced Dealer | As above but with the ability to edit parameters that relate directly to wheelchair accessories (e.g. actuators). |
| Factory | Can only replace Standard or Custom Wheelchair Programs. No editing or diagnostics available. |

Warning : The Wizard is a very powerful tool and as such requires well trained operators and a disciplined approach to usage and distribution.

It is up to the wheelchair manufacturer to determine whether they will distribute the Wizard to dealers. Refer to Wizard Documentation for further details.

A DX-ACU3 can be programmed with the Wizard using a 24V power supply and an optional Power Module. If the DX-ACU3 is connected directly to the 24V power supply, then a DXBUS Cable can have one end modified to connect to the power supply.



**DXBUS Pins
(viewed from outside)**

Hand Held Programmer

The DX Hand Held Programmer (HHP) is the normal programming tool used by dealers, allowing easy adjustment of all commonly adjusted Drive Program parameters.

Warning : The DX HHP is for use only by wheelchair manufacturers, their authorised dealers and support personnel. It is not intended for use by the wheelchair user.

The DX HHP Manual should be read and understood before attempting to use it.

Wizard High Volume Programming

Programming in the factory environment is normally done using the Wizard. With the Wizard's "Create a new Chair" Program option, you can set up the standard parameters for the DX-ACU3 and any other modules used for a particular wheelchair. This Chair Program is then saved to disk under a name such as "SuperChair, Deluxe, with lights" and can be down-loaded to the DX-ACU3 at the push of a button.

Example

Modify/Edit the "SuperChair, Deluxe, with Lights" Chair Program as follows.

- 1 Enter the Wizard's Main Menu screen as described in the Wizard Installation Sheet.
- 2 Use the keyboard or the mouse, to select the File, Open menu option.
- 3 Select the "SuperChair, Deluxe" program from the dialog box.
- 4 Select the 'Edit Module Parameters' menu option.
- 5 Select 'UCM Remote' or the required group of parameters.
- 6 Scroll through the list of parameters and adjust as necessary.
- 7 Press «Enter» to accept the changes, or «Esc» to exit without saving. Select the File, Save menu option. These values will then be part of the Standard Chair Program for the "SuperChair, Deluxe".

Down-load the “SuperChair, Deluxe” to a DX-ACU3 as follows.

- 1 Connect the Wizard serial communications cable to the DX-ACU3 programmer socket and return to the main menu of the Wizard.
- 2 Use the keyboard or the mouse to select the File, Open menu option.
- 3 Select the “SuperChair, Deluxe” program from the dialog box.
- 4 Select the ‘Wheelchair Write’ option.
- 5 Choose if the Chair Program is to be down-loaded to the ‘Total System’ (to program a fully built up chair system) or just the ‘UCM Remote’ (to pre-program the DX-ACU3 only).
- 6 Press «Enter» to write the Chair Program data.
- 7 Disconnect the DX-ACU3 and repeat for as many DX-ACU3’s, or DX Systems, as required, by repeating steps 4 through 7.

DX-ACU3 Wizard Programming

The Wizard accesses a set of parameters that are programmed to define the configuration desired by a wheelchair manufacturer.

Some parameters can be both read and written to (edited) by an OEM and a Dealer. Other parameters can only be read but not edited. Some parameters available to an OEM are not displayed by a dealer.

The DX System, with the DX-ACU3, supports up to five user selectable Drive Programs. The Drive Programs govern the performance of the wheelchair, as suitable for different environmental and user conditions. Drive Programs are also adjustable with the HHP.

Remaining parameters are related to other system functions and DX Modules which may, or may not, be included in your DX System.

Parameter Specifications

	Page	Parameter	Range / State	Default	HHP	Dealer Wizard	Enhanced Dir. Wizard	OEM Wizard
Drive Program	21	Maximum Forward Speed	10 - 100 %	*	Yes	Read / Write	Read / Write	Read / Write
	21	Forward Acceleration	10 - 70 %	40	Yes	Read / Write	Read / Write	Read / Write
	21	Forward Deceleration	15 - 100 %	45	Yes	Read / Write	Read / Write	Read / Write
	22	Maximum Reverse Speed	10 - 100 %	*	Yes	Read / Write	Read / Write	Read / Write
	22	Reverse Acceleration	10 - 70 %	40	Yes	Read / Write	Read / Write	Read / Write
	22	Reverse Deceleration	15 - 100 %	50	Yes	Read / Write	Read / Write	Read / Write
	22	Maximum Turning Speed	10 - 100 %	*	Yes	Read / Write	Read / Write	Read / Write
	22	Turning Acceleration	10 - 70 %	20	Yes	Read / Write	Read / Write	Read / Write
	22	Turning Deceleration	15 - 100 %	60	Yes	Read / Write	Read / Write	Read / Write
	22	Damping Point	10 - 100 %	40	Yes	Read / Write	Read / Write	Read / Write
	22	Joystick Source	Local / Remote	Local	Yes	Read / Write	Read / Write	Read / Write
	23	Reverse Joystick Forw/Rev	Normal / Reverse	Normal	Yes	Read / Write	Read / Write	Read / Write
	23	Sleep Timeout	1 - 15 minutes	5	-	Read / Write	Read / Write	Read / Write
Keypad & Speed Pot	23	Maximum Profile Number	1-May	5	-	Read / Write	Read / Write	Read / Write
	23	Wrap Profiles	Yes / No	Yes	-	Read	Read	Read / Write
	23	Change Profile While Driving	Yes / No	Yes	-	Read / Write	Read / Write	Read / Write
	23	Allow Non-driving Profile	Yes / No	No	-	-	-	Read / Write
	23	Lock Enable	Yes / No	Yes	-	Read / Write	Read / Write	Read / Write
	24	Speed Pot Scaler	20 - 100 %	100	-	Read / Write	Read / Write	Read / Write
Joystick	24	Sleep Mode Enable	On / Off	Off	-	Read / Write	Read / Write	Read / Write
	24	Neutral Maximum	10 - 50 %	10	-	Read	Read	Read / Write
	24	Neutral to PB Delay	20 - 5000 msec.	160	-	-	-	Read / Write
	24	Reverse UCM Joystick L/R	Normal / Reverse	Normal	Yes	Read	Read / Write	Read / Write
	24	ACU Enable	Yes / No	Yes	-	-	Read	Read / Write
	24	Reverse ACU Joystick	Normal / Reverse	Normal	-	Read	Read / Write	Read / Write
Actuator	25	RJM Enable	Yes / No	Yes	-	Read	Read	Read / Write
	25	Reverse RJM Joystick	Normal / Reverse	Normal	-	Read	Read / Write	Read / Write
	25	CLAM Enable	Yes / No	No	Yes	Read	Read / Write	Read / Write
	25	CLAM is Critical	Yes / No	No	-	Read	Read / Write	Read / Write
	25	CLAM Slowdown	0 - 100 %	50	-	Read	Read / Write	Read / Write
	26	Actuator 1-5 Enable	Yes / No	**	-	Read	Read / Write	Read / Write
	26	Actuator 1-5 Current Limit	2.1 - 14 Amps	6.1	-	Read	Read / Write	Read / Write
	26	Actuator Timeout	1 - 120 seconds	30	-	Read	Read / Write	Read / Write
	26	Actuator Open Circuit Test	Yes / No	No	-	-	Read / Write	Read / Write
	26	ARC Enable	Yes / No	No	-	Read	Read / Write	Read / Write
Lighting	26	Joystick Actuators	Yes / No	Yes	-	Read	Read / Write	Read / Write
	26	Num Actuator Buttons	One / Two	Two	-	Read	Read / Write	Read / Write
	27	Actuator While Driving	Yes / No	No	-	Read	Read / Write	Read / Write
	27	Lighting Module Enable	Yes / No	No	Yes	Read	Read / Write	Read / Write
	27	CLAM Lighting Enable	On / Off	On	-	Read	Read / Write	Read / Write
Miscellaneous	27	Side Lights Enable	Yes / No	No	-	Read	Read / Write	Read / Write
	27	Indicators Enable	Yes / No	No	-	Read	Read / Write	Read / Write
	27	Hazard Lights Enable	Yes / No	No	-	Read	Read / Write	Read / Write
	28	Soft-Start Acceleration	Enable/Disable	Enable	-	Read / Write	Read / Write	Read / Write
SCI	28	Power-up Delay	0 - 10	0	-	Read / Write	Read / Write	Read / Write
	28	ECU 1 Enable	Yes / No	No	-	Read / Write	Read / Write	Read / Write
	28	ECU 2 Enable	Yes / No	No	-	Read / Write	Read / Write	Read / Write
		ECU 3 Enable	Yes / No	No	-	Read / Write	Read / Write	Read / Write

* Varies with different Drive Programs.

** Varies with different Actuators.

Drive Program Parameters

The five Drive Programs (or Profiles) can be set up as, for example, an Indoors program, an Outdoors program or a Sports program. These settings are originally factory set to the values defined in the Chair Program used by the Wizard during the down-loading process.

The values of the Drive Programs can be altered for a particular wheelchair user using an HHP if necessary (except Damping Point and Sleep Timeout).

Program (Profile) 6 (or ACU Drive Program) is a special program that is automatically selected when an Attendant Control Unit (ACU) is connected and in the Attendant mode. Note that Program 6 is not programmable using the HHP on a standard DX-ACU3. When the ACU is disconnected, or it returns to the 'User Mode', the wheelchair automatically reverts to the Program that was selected prior the ACU becoming active.

Note : As all program settings are stored in the DX-ACU3, replacement of the DX-ACU3 in the DX System may result in a change in Drive Program values that may be substantially and dangerously different from those of the DX-ACU3 it replaced. The Wizard may be used to up-load and save the 'old' system settings for later reprogramming of the replacement DX-ACU3.

The Wizard can be used to restrict the minimum and maximum limits for Drive Program parameters adjustable with an HHP.

Maximum Forward Speed

Sets the maximum speed obtainable for maximum forward joystick deflection.

Forward Acceleration

Sets the maximum output (linear) acceleration rate for large joystick forward deflections, where 70% provides the quickest response.

Warning : Setting the Acceleration / Deceleration too low or too high can result in an unsafe wheelchair. Test thoroughly after programming to ensure that the wheelchair complies with regulatory requirements such as ISO7176 7176 and the GMD-TND Homologation Directive R04 for maximum allowable braking distance.

Forward Deceleration

Sets the maximum braking effect (linear deceleration) for large joystick deflection back towards neutral, where 100% provides maximum braking effect.

Maximum Reverse Speed

Sets the maximum speed obtainable for maximum reverse joystick deflection.

Reverse Acceleration

Sets the maximum output (linear) acceleration rate for large joystick backward deflections, where 70% provides the quickest response.

Reverse Deceleration

Sets the maximum braking effect (linear deceleration) for large joystick deflection back towards neutral, where 100% provides maximum braking effect.

Maximum Turning Speed

Sets the maximum turning speed obtainable for maximum joystick deflection left or right.

Turning Acceleration

Sets the maximum output (linear) acceleration rate for large joystick left and right deflections, where 70% provides the quickest response.

Turning Deceleration

Sets the maximum braking effect (linear deceleration) for large joystick deflection back towards neutral, where 100% provides maximum braking effect.

Damping Point

The damping point defines the speed error size (of output speed verses joystick demand speed) using progressive error reduction (ie acceleration / deceleration). Speed errors exceeding this value will be limited to the program maximum linear acceleration or deceleration rate. In other words it sets the 'compromise' ratio between joystick directness / responsiveness and chair controllability. Note: for most applications the default value of 40% should not require adjusting. Achieving the desired response is done by setting the appropriate acceleration / deceleration values.

Warning : An unsuitably high or low value can make the wheelchair unstable.

Joystick Source

Selects whether the Drive Program will use the ACU3's built-in joystick or an external RJM based input control device.

Reverse Joystick Forw / Rev

Reverses the direction of the ACU3's inbuilt joystick, This can be set for each profile.

If set to 'Normal', forward and reverse joystick deflection causes forward and reverse motion respectively.

If set to 'Reverse', forward and reverse joystick deflection causes the opposite effect. Used if the ACU3 is to be mounted in any other than standard orientation in order to maintain joystick sense.

Sleep Timeout

Inactivity timeout. The DX system goes to sleep after 'x' minutes of inactivity, if enabled.

Keypad and Speed Pot Parameters**Maximum Profile Number**

Sets the number of Drive Programs available for selection by the user of the ACU3. The ACU3 supports up to 5 Drive Programs (Profiles).

Wrap Profiles

Allows Profile 5 (or the maximum number programmed) to wrap around to Profile 1 (and vice-versa).

Change Profile While Driving

If set to 'No', the Drive Program can only be changed while the wheelchair is stopped. If set to 'Yes', the Drive program can be changed while driving.

Warning : Care should be taken when set to 'Yes' if adjacent Drive Programs have markedly different settings (includes wrap-around between Program 1 and Program 5).

We recommend you do not set this parameter to 'Yes' if the DX System contains an RJM based input device, as this would cause the wheelchair to come to a sudden halt when changing to an RJM Drive Program, or visa versa.

Allow Non-driving Profile

If set to 'Yes', Drive Program 0 is enabled and is displayed between Drive Profile 5 and Drive Profile 1.

Lock Enable

The ACU3 does not have a magnetic key operated lock function. Do not change default.

Speed Pot Scaler

The ACU3 does not have a speed potentiometer, do not change default. Sets the maximum forward and reverse speed scalar when speed pot is set at minimum.

Sleep Mode Enable

Set to 'Enable' if Sleep Mode is required. System goes to sleep (partial power down) after [sleep timeout] minutes of inactivity. The system can be woken up by activating the last selected device or any switch on the ACU3.

Joystick Parameters**Neutral Maximum**

Determines the neutral window size. Affects all joysticks used in the system. Adjust only in special cases.

Neutral to PB Delay

The delay between zero output speed and de-energising the Park Brake. It is dependant on the particular Park Brake mechanics and motor characteristics. It is set so as to minimise the jerk or roll back when parking on a slope. The jerk is also influenced by the Load Compensation setting in the Power Module.

Reverse UCM Joystick L/R

Reverses the direction (left / right) of the ACU3's inbuilt joystick.

If set to 'Normal', left and right joystick deflection causes a left and right turn, respectively. If set to 'Reverse', left and right joystick deflection produces the opposite effect. Forward and reverse are not affected. Used if the ACU3 is mounted in an other than standard orientation in order to maintain normal joystick sense.

ACU Enable

If another ACU is used for attendant control, this must be set to 'Yes'. The ACU3 will automatically detect the presence of another ACU when the DX System is turned on.

Reverse ACU Joystick

Reverses the direction (left / right) of the ACU joystick.

If set to 'Normal', left and right joystick deflection causes a left and right turn, respectively. If set to 'Reverse', left and right joystick deflection produces the opposite effect. Forward and reverse are not affected. Used if another ACU is used and is mounted in an other than standard orientation in order to maintain normal joystick sense.

RJM Enable

Must be set to 'Yes' for Remote Joystick Module (RJM) operation. The ACU3 will automatically detect the presence of an RJM when the DX System is turned on.

Reverse RJM Joystick

Reverses the direction (left / right) of the RJM joystick. If set to 'Normal', left and right joystick deflection causes a left and right turn, respectively

If set to 'Reverse', left and right joystick deflection produces the opposite effect. Forward and reverse are not affected. Used if the RJM is mounted in an other than standard orientation in order to maintain normal joystick sense.

Actuator Parameters

Refer to the Installation Manual for the DX Module driving the actuators, e.g. TAM, CLAM, ARC5.

CLAM Enable

Must be set to 'Yes' for CLAM or TAM operation.

CLAM is critical

If set to 'Yes', a CLAM or TAM must be present in the system and operating normally. The loss or lack of communications between the CLAM (or TAM) and the ACU3 will cause the wheelchair to stop, and a Flash Code 1 to be displayed by the Remote.

If set to 'No', the wheelchair will drive normally with no CLAM (or TAM) attached. Providing that all CLAM (or TAM) parameters have been programmed, this is a useful factory setting. It allows a CLAM (or TAM) to be added later to wheelchair systems that do not have one fitted, without the HHP or Wizard.

CLAM Slowdown

Set to a required percentage of maximum wheelchair speed allowed when the slow input is active. For this facility to be used, the hardware of the wheelchair must be arranged as described in the Slow / Stop section in the Installation Manual of the DX Module driving the actuators, e.g. CLAM or TAM.

Actuator 1 - 5 Enable

If set to 'Yes', the Actuator is enabled.

If set to 'No', there will be no response from the actuator.

Refer to the Installation Manual for the DX Module driving the actuators, e.g. TAM, CLAM, ARC5.

Actuator 1 - 5 Current Limit

Sets the current trip point for each actuator between the allowable range of 2.1 - 14 Amps. Refer to the Installation Manual of the Actuator Module for details.

Actuator Timeout

Sets the maximum time a wheelchair user can continuously operate any actuator.

Actuator Open Circuit Test

When set to 'Yes', an open circuit at the actuator output pins of the Actuator Module (e.g. TAM or CLAM), will cause a Flash Code 2 to be displayed (see Diagnostics section). The wheelchair will still drive.

ARC Enable

Must be set to 'Yes' for Actuator Remote Control (ARC) operation.

Set to 'No' for control of actuators by the switches on the ACU3 and joystick.

Joystick Actuators

Set to 'No' if switch operation of actuators is required. This is used if the Actuator switches on the ACU3 are used to operate, extend and retract the actuator.

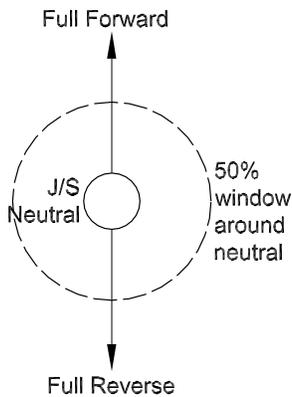
Set to 'Yes' if joystick operation of actuators is required. The Actuator Select switch will now select the actuator, if fitted, but will not cause it to operate. If the wheelchair is driving when an actuator is selected, it will stop driving.

Num Actuator Buttons

When set to 'one', pressing an Actuator Select switch, or moving the joystick forward, will toggle between the actuator up / extend and actuator down / retract.

Can only be set to 'two' for the ACU3 if the Joystick Actuator parameter is set to 'Yes' or if only one actuator is used and actuator 2 is disabled. In this case, the joystick forward is used for actuator up / extend, and joystick down for actuator down / retract.

Actuator While Driving



If set to 'No', the wheelchair will not drive while an actuator is being operated. If the wheelchair is driving, the actuator command will be ignored until the joystick returns to neutral.

If set to 'Yes' and the Joystick Actuator parameter is set to 'Yes', pressing the actuator button will stop the wheelchair from driving and select the actuator. The joystick can not be used to operate the actuator until it has returned to within the 50% window around neutral.

If the Joystick Actuator parameter is set to 'No', actuators can be operated irrespective of the driving state of the wheelchair.

Lighting Parameters

Lighting Module Enable

Set to 'Yes' for Lighting Module (LM) operation. 'No' if Combined Lighting Actuator Module (CLAM) based lights are used. Lighting is not supported by the ACU3.

CLAM Lighting Enable

Set to 'Yes' for CLAM operation, 'No' in all other cases. Lighting is not supported by the ACU3.

Side Lights Enable

If set to 'Yes', Side Lights, if fitted, can be operated. If set to 'No', there will be no response. Lighting is not supported by the ACU3.

Indicators Enable

If set to 'Yes', Indicators, if fitted, can be operated. If set to 'No', there will be no response. Lighting is not supported by the ACU3.

Hazard Lights Enable

If set to 'Yes', Hazard Lights, if fitted, can be operated. If set to 'No', there will be no response. Lighting is not supported by the ACU3.

Miscellaneous Parameters

Soft-Start Acceleration

The UCM may be set to enable slow acceleration to give a more gentle start when accelerating from rest, particularly when high Load Compensation settings are used.

Power-up Delay

The Power-up Delay may be used to prevent the chair from driving until the user has had enough time to get their hand from the power button on to the joystick. During the Power-up Delay, the system will be in an inhibit condition and any accidental deflections of the joystick will not cause the chair to drive.

SCI Parameters

ECU 1 Enable

Set to 'Yes' for Environment Control Unit (ECU) operation. ECU operation is not supported by the ACU3.

ECU 2 Enable

Set to 'Yes' for Environment Control Unit (ECU) operation. ECU operation is not supported by the ACU3.

ECU 3 Enable

Set to 'Yes' for Environment Control Unit (ECU) operation. ECU operation is not supported by the ACU3.

DX-ACU3 HHP Programming

Warning : Do not plug the HHP Programmer in while the vehicle is in motion.

Plug in the HHP Programmer while the DX System is turned on.

If the DX System is turned off during programming, new settings will not be saved and the DX System will retain all previous settings.

Plugging the DX Hand Held Programmer (HHP) into a turned on DX System gives immediate access to a set of main menu options. The length of the main menu depends on how many DX Modules are connected to the DXBUS. Refer to the DX HHP Manual for full details.

Initial Operation

1. When the HHP is plugged into the ACU3's Programmer Socket the initial screen appears for two seconds.

Dynamic DX Programmer Version 1.xx
--

If a fault has occurred, the fault screen appears.

SYSTEM FAULT 5 L parkbrake EXIT
--

The number and message displayed represents the Flash Code. See the Diagnostics section for the list of faults that can be displayed.

Press EXIT to return to the main menu.

2. Then the main menu screen reads :

* * MAIN MENU * *	
View or edit?	
Program : 1 ?	
NEXT	YES

Pressing NEXT cycles through the Main Menu options. These are the Drive Programs and Technician Mode enable / disable.

Test Driving and Saving Changes

Changes can be test driven before being permanently saved as the DX System can be driven with the HHP plugged in. Even if the HHP is disconnected the changes will remain current unless the DX Remote is turned off. Once turned off, the settings will return to the original values.

Changes are saved when the 'NEXT' button on the HHP is pressed. If the DX Remote is turned off before the HHP is returned to the main menu, all changes to the current parameter being modified are lost.

To View / Adjust Drive Programs

Pressing 'EXIT' at any point during the procedure will return you to the main menu.

1. Press 'NEXT' in the main menu until the appropriate Drive Program is shown.

* * MAIN MENU * *	
View or edit?	
Program : 1 ?	
NEXT	YES

2. Press 'YES' to edit Drive Program.

3. The screen now reads :

TUNE PROG 1 RESPONSE			
Max forward speed			
25 %			
EXIT	NEXT	UP	YES

Press 'NEXT' to step through the adjustable parameters and press 'UP' or 'DOWN' to adjust the value (excluding Joystick Source).

These are : Max forward speed
 Forward Acceleration
 Forward Deceleration
 Max reverse speed
 Reverse acceleration
 Reverse deceleration
 Max turning speed
 Turning acceleration
 Turning deceleration
 Damping point
 Joystick source
 Joystick Reverse

To Adjust Joystick Source

1. The Joystick Source screen reads :

TUNE PROG 1 RESPONSE		
Joystick source		
Local		
EXIT	NEXT	SWAP

Pressing 'SWAP' toggles the parameter between :
 'Remote' if an RJM based input device is fitted, and;
 'Local' if the joystick on the ACU3 is to be used.

Joystick Reverse

1. Press 'NEXT' until the main menu reads :

* * MAIN MENU * *		
Joystick reverse		
NO		
NEXT		SWAP

- Pressing 'SWAP' toggles the parameter between 'Yes' and 'No'. This parameter reverses the direction of the controlling joystick. The controlling joystick is set in "Joystick Source". Can be set for different profiles. Profile 6 will affect the ACU.

If set to 'No', forward and reverse joystick deflection causes forward and reverse motion respectively.

If set to 'Yes', forward and reverse joystick deflection produces the opposite effect. Used if the ACU3 is mounted upside down (keypad pointing towards user in Chin or Tray applications) to maintain normal joystick sense.

This parameter is identical to the Wizard parameter "Reverse Joystick Forw/Rev".

To Enable Technician Mode

- Press 'NEXT' until the Technician Mode screen appears :

```

** MAIN MENU **
Technician Mode
disabled. Enable ?
NEXT          YES
  
```

Pressing 'YES' toggles this screen between Technician Mode Enabled and Technician Mode Disabled. If disabled, press 'YES' to enable.

- Press 'YES' and a password screen will appear. Enter the three digit password.

```

Technician Mode
Enter Password
      0 0 0
EXIT  D1      D2      D3
  
```

- Press the D1, D2 and D3 buttons to cycle each digit through to the correct password. When the password reads correctly, press the 'EXIT' button.

The screen now reads :

```

** MAIN MENU **
Technician Mode
enabled. Disable ?
NEXT          YES
  
```

Joystick Calibration

1. Enable the Technician Mode
2. Press 'NEXT' in the main menu until the screen reads :

```

** MAIN MENU **
View or edit Remote
Module ? (Tech Only)
NEXT           YES

```

Press 'YES'.

3. The display reads:

```

JOYSTICK CALIBRATION

EXIT  NEXT  BEGIN

```

Pressing 'EXIT' at any point during the calibration procedure will return you to the main menu screen.

4. Press 'BEGIN'.

```

JOYSTICK CALIBRATION
Rotate J/S
-> Neutral -> END
EXIT           END

```

5. Move the joystick around the outer physical extremities of the restrictor plate. Ensure that all corners are pressed into.
Return the joystick to neutral.
6. Press 'END' to end the sequence and return to the main menu.
The calibration is saved.

Combined Lighting Actuator Module (CLAM) Enable

1. Enable the Technician Mode.
2. Press 'NEXT' in the main menu until the screen reads:

```

** MAIN MENU **
View or edit Remote
Module ? (Tech Only)
NEXT          YES

```

Press 'YES'.

3. The display reads:

```

CLAM
disabled. Enable ?
EXIT  NEXT          YES

```

Pressing 'YES' toggles between CLAM enabled and CLAM disabled.
Setting this parameter to 'enabled' allows the CLAM or TAM to be used in the DX System.
Pressing 'EXIT' will return you to the main menu screen.

Lighting Module (LM) Enable

1. Enable the Technician Mode.
2. Press 'NEXT' in the main menu until the screen reads:

```

** MAIN MENU **
View or edit Remote
Module ? (Tech Only)
NEXT          YES

```

Press 'YES'.

3. The display reads:

```

LM
disabled. Enable ?
EXIT  NEXT          YES

```

Pressing 'YES' toggles between LM enabled and LM disabled.
Setting this parameter to 'enabled' allows the LM to be used in the DX System.
Pressing 'EXIT' will return you to the main menu screen.

9 Diagnostics and Fault Finding

DX-ACU3 diagnostics can be examined from two platforms : from the Flash Codes signalled with the System Status LED on the DX-ACU3 (and on the HHP); and from the Wizard which can provide more detailed information about the fault.

Flash Codes

Any fault condition on the DX system will cause the DX-ACU3's System Status LED to flash. Flashing occurs in bursts of flashes separated by a two second pause. The number of flashes in each burst is referred to as the Flash Code and indicates the nature of the fault. The title of the Flash Code fault is also displayed by the HHP if connected to the faulty wheelchair.

Faults that affect the safety of the chair will cause the chair to stop while less critical ones will be indicated but allow the chair to continue driving. Some faults will automatically clear when the fault condition is removed, in which case the System Status LED will become steady and the wheelchair may be driven normally. Other faults are latched and must be cleared by turning the DX System off, waiting for five seconds, and then turning it back on again.

Further details on these fault types can be found in the Diagnostics section of the Power Module Installation Manual (GBK63824).

DX System Status LED	
Flash Code	Likely Cause of Condition and Probable Action
1	<p>DX Module Fault (see Limp Mode below)</p> <p>Cause: An Auto Download has occurred. Action: • Turn the DX-ACU3 off then on again.</p> <p>Cause: The DX-ACU3 is not correctly programmed. Action: • Try reprogramming the DX-ACU3.</p> <p>Cause: Connection between DX Modules may be faulty, or there may be an internal fault in a Module. Action: • Check DXBUS connections and replace where necessary. • If the Status LED on another Module is flashing, replace the Module. • An expected module may not be present (e.g. the DX Lighting Module).</p>

DX System Status LED	
Flash Code	Likely Cause of Condition and Probable Action
2	DX Accessory Fault Cause: There is a fault in an accessory device attached to a DX Module (excluding the PM). Examples of faults in accessory devices may be : the clutch is, or has been, disengaged; a light bulb is short or open circuit; an actuator terminal is shorted to Battery +. Action: <ul style="list-style-type: none"> • Check all accessory devices connected to your DX System. Cause: The Slow / Stop input on the CLAM or TAM is not connected, or is set to slow or stop.
3	Left (M1) Motor Fault Cause: The connection from the PM left (M1) connector to its associated motor, or the motor itself, is defective. The connection is either open or short circuit. Action: <ul style="list-style-type: none"> • Disconnect the left motor plug and check continuity between the motor pins on M1. • Ensure there is no continuity between motor and park brake terminals.
4	Right (M2) Motor Fault Cause: The connection from the PM right (M2) connector to its associated motor, or the motor itself, is defective. The connection is either open or short circuit. Action: <ul style="list-style-type: none"> • Disconnect the right motor plug and check continuity between the motor pins on M2. • Ensure there is no continuity between motor and park brake terminals.
5	Left (M1) Park Brake Fault Cause: The M1 plug connection to its associated Park brake is either open or short circuit. Action: <ul style="list-style-type: none"> • Disconnect the M1 plug and check continuity between the two Positronic park brake pins. • Ensure there is no continuity between motor and park brake terminals.
6	Right (M2) Park Brake Fault Cause: The M2 plug connection to its associated Park brake is either open or short circuit. Action: <ul style="list-style-type: none"> • Disconnect the M2 plug and check continuity between the two Positronic park brake pins. • Ensure there is no continuity between motor and park brake terminals.
7	Low Battery Fault Cause: The battery charge is not sufficient to allow safe driving. It has fallen below 17V. Action: <ul style="list-style-type: none"> • Check battery connection and terminals. The battery voltage should be similar when the battery is on charge, and when it isn't. • Check that fuses have not blown, or circuit breakers tripped. • Replace battery if worn out or if capacity is insufficient for the user's needs.
Note: The wheelchair will behave sluggishly and the Battery Gauge will flash indicating low battery voltage prior to the display of this fault.	

**DX System
Status LED****Flash Code Likely Cause of Condition and Probable Action****8 Over Voltage Fault**

Cause: The battery voltage has exceeded 32V.

Action:

- If this fault occurs during battery charging, the battery charger is defective or incorrectly adjusted.

- Check the battery chargers open circuit voltage is in accordance with the battery manufacturers limits, and is less than 32V.

Cause: The battery connector is making intermittent contact when the wheelchair is stopped, or travelling down a slope.

Action:

- Check that the battery wiring and terminating is secure.

9 CANL Fault (see Limp Mode below)

Cause:

1. An invalid voltage has been detected on the DXBUS CANL line.

2. Communication is not possible using the CANL wire.

Action:

- Check the continuity of the DXBUS cable.

- Check for shorts between DXBUS pins. An open or short circuit on another DX Module can cause this fault.

10 CANH Fault (see Limp Mode below)

Cause:

1. An invalid voltage has been detected on the DXBUS CANH line.

2. Communication is not possible using the CANH wire, or the CANH and CANL wires are shorted together.

3. Hazard lights were turned on when the DX System was turned on.

4. The CANH is used to generate a Kill signal by any DX Module which detects an unsafe condition, or by an external device such as an emergency stop switch.

5. The CANH wire is pulled to either Battery + or Battery - and causes the DX System to shut down.

Action:

- Check the continuity of the DXBUS cable.

- Check for shorts between DXBUS pins. An open or short circuit on another DX Module can cause this fault.

- If the Hazard Lights were already switched on when the DX System was turned on, Flash Code 10 and Limp Mode (slow driving) may result. To clear this fault, turn the Hazard Lights off, then turn the DX System off then on again.

- If generated by a Kill signal, the cause of the fault is severe.

11 Stall Timeout Fault

Cause: The motor current has been at, or close to, current limit for longer than the Stall Timeout parameter value.

Action:

- Turn the DX System off then on again.

Cause: Motor(s) are faulty. Wheel(s) may be rubbing on frame.

Action:

- Ensure wheels turn freely while under no load. Have motor(s) checked by a service technician.

DX System Status LED	
Flash Code	Likely Cause of Condition and Probable Action
12	Module Mismatch Cause: There is a compatibility problem between DX Modules in the System. The wheelchair will be disabled. Action: <ul style="list-style-type: none"> • Consult your Dynamic Service Centre. Cause: The data held by the DX-ACU3 for another DX Module is corrupt or incompatible with that module. Action: <ul style="list-style-type: none"> • Reprogramming the wheelchair system may correct this problem.

Limp Mode

If the DX System detects some faults, it will revert to Limp Mode. This is a reduced speed mode which recognises problems, but allows the wheelchair user to limp home, where the problem can be assessed.

Warning : If the DX System is displaying a fault and the chair enters Limp Mode, do not operate except to reach a safe environment. Proceed with caution as the chair performance may be significantly altered. Have the chair serviced by a Service Agent.

Wizard Diagnostics

The Programming Configuration Diagnostic tool (or Wizard) is used to provide diagnostics for the ACU3.

To View Diagnostics

1. Enter the Wizard's Main Menu screen as described in the Wizard installation Sheet.
2. Select the 'Diagnostics' menu. The menu displays the following options :
 - Status Report
 - Print Report
 - Save Report to File
 - View Chair Log
 - Erase Chair Log

Print Chair Log prints the Status Report followed by the Chair Log. These reports should be sent along with a faulty controller to a Service Centre. Contact a Dynamic Sales and Service Centre (refer to Sales and Service Information).

Status Report

Status report gives you the current status of the wheelchair, including faults and other warning conditions currently active. Pressing «?» Or selecting 'Info' will display further information about the condition. Some conditions in the Status Report are not caused by actual faults, but are only temporary conditions (e.g. a motor lead was not connected when the DX System was turned on and driving was attempted, producing a Motor Fault).

View Status Report

1. Enter the Wizard's Main screen as described in the Wizard Installation Sheet.
 2. Select the 'Diagnostics' menu.
 3. Select 'Status Report'.
 4. From the 'Modules Attached' menu, select 'UCM Remote'.
-

Print Status Report

1. Enter the Wizard's Main screen as described in the Wizard Installation Sheet.
 2. Select the 'Diagnostics' menu.
 3. Select 'Print Report'.
 4. Enter any additional information that is required to be printed along with the status report.
-

Save Report to File

1. Enter the Wizard's Main screen as described in the Wizard Installation Sheet.
2. Select the 'Diagnostics' menu.
3. Select 'Save Report to File'.
4. Enter any additional information that is required to be saved along with the status report.
5. Enter the location where you would like to save the text document.

Chair Log

The Chair Log displays all faults and warning conditions recorded for the wheelchair since the Chair Log was last erased. Some conditions logged in the Chair Log are not caused by actual faults, but are only temporary conditions e.g. a motor lead was not connected when the DX System was turned on and driving was attempted, producing a Motor Fault. It is recommended to erase the Chair Log once the system is fully functional as only the previous 15 fault conditions are recorded.

View the Chair Log

1. Enter the Wizard's Main Menu screen as described in the Wizard Installation Sheet.
 2. Select the Diagnostics' menu.
 3. Select 'Chair Log'.
 4. From the 'Modules Attached' menu, select 'UCM Remote'.
-

Erase Chair Log

1. Enter the Wizard's Main Menu screen as described in the Wizard Installation Sheet.
 2. Select the Diagnostics' menu.
 3. Select 'Erase Chair Log'.
 4. From the 'Modules Attached' menu, select 'UCM Remote'.
-

Chair Log Codes

The following pages list the Chair Log codes and probable causes of these faults. If the suggested action does not remove the fault, contact a Sales and Service Centre.

Message Probable Cause and Action**CPU / General Fault**

Cause: Internal Fault.

- Action:
- Replace Remote
 - Consult an approved Dynamic Service Agent.

ADC Fault

Cause: Internal Fault.

- Action:
- Replace Remote.
 - Consult an approved Dynamic Service Agent.

CAN Short Fault

Cause: Short between CANL and CANH.

- Action:
- The short may be within a module or within a DX Cable, or the exposed DXBUS contacts may be shorted by foreign material. Ensure that all DXBUS contacts are clean.

Warning: Open circuit breaker or disconnect from PM before probing around DXBUS connectors.

- Disconnect any optional modules and turn on the Remote. Use the Wizard Status Report to check if the CAN shorted fault is still present. If possible, substitute the DXBUS Cable between the Remote and the PM. Disconnect any unnecessary DXBUS Cables. When the fault no longer occurs, add cables and modules one by one until the faulty cable or module is identified. Replace the faulty part. If the fault remains, try replacing the Remote and the PM.
- If the fault cannot be reproduced, check all cables and DX connectors for foreign material or damage.

CANL Fault

Cause: CANL failure.

- Action:
- Check for a short from CANH to another DXBUS wire, or a short from CANL to DXBUS- or DXBUS+.

Wake-up Fault

Cause: Incorrect voltage on CANH.

- Action:
- Check for a short from CANH to another DXBUS wire, or a short from CANL to DXBUS- or DXBUS+.
 - Check battery wire terminations.

J/S OONAPU Occurrence

Cause: The joystick was Out Of Neutral At Power Up. This is a fault condition produced if the DX System is turned on while the joystick is not in the neutral or non-driving position.

- Action:
- Allow the joystick to return to neutral and turn the DX System off then on again.

Power Button Open Circuit

Cause: The Remote On/Off switch may be shorted or open circuit.

- Action:
- Check for broken wires or faulty connections.
 - Turn the Remote Off, then On again.

Power Button Stuck

Cause: The Remote On/Off switch may have been held down too long, or appears to be short circuited or a wire to the power button is broken.

- Action:
- Check for broken wires or faulty connections.
 - Turn the Remote Off, then On again.

Message Probable Cause and Action

Joystick Mirror Fault

Cause: Joystick internal fault.

- Action:
- Replace joystick.
 - Consult an approved Dynamic Service Agent.

Joystick Absolute Error Fault

Cause: Joystick internal fault.

- Action:
- Replace joystick.
 - Consult an approved Dynamic Service Agent.

Joystick Fault

Cause: The joystick may need to be re-calibrated.

- Action:
- Consult an approved Dynamic Service Agent.
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