

dynamic™ 



SHARK

Quick Start Guide

Issue 1, December 2011

About this manual

This manual must be read together with all other relevant SHARK Module manuals, as well as all applicable Dynamic Controls Technical Service Bulletins (TSBs), application notes and service instructions.

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



Notes & Precautions:

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.



Warnings:

*Warnings provide important information that **must** 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.*

The term 'programming' used throughout 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.

SHARK is not user serviceable. Specialized tools are necessary for the repair of any SHARK component.

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

Dynamic Controls 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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Introduction

This is a quick start guide for the SHARK powerchair controller system. It provides an overview of the SHARK system, a “How to...” section, and a troubleshooting section. For details concerning installation and programming and more detailed diagnostics, please consult the relevant installation manuals (see the Further reading section for more details).

This manual comprises three main sections:

The SHARK system – this section provides an overview of the SHARK system, detailing the power module, and how to use the remote.

How to... – the how to section quickly shows you how to accomplish some common tasks such as reading the HHP diagnostics, and configuring the joystick.

Troubleshooting – this section provides a number of solutions to some of the most common faults found within a powered powerchair system.

The SHARK system

The Shark Wheelchair Control System is designed to deliver outstanding performance, reliability and safety at superior value to the customer. Simple and easy to use, yet robust and reliable to cope with all demanding environments. There are options with 1 or 2 actuators, with lights and without lights. The wide range of power modules and options make the Shark Power Wheelchair Control System suitable for the vast majority of power wheelchair applications.

Benefits

- Low training costs because Shark is simple to configure and use
- Get the best value solution by matching the power rating (40A, 50A, 60A, 75A or 90A) to the application
- Superior power and safety from the dedicated power module
- Access to the world and chair info with iPortal™
- Superior value through not needing separate lighting or actuator modules
- Reduced wiring for lights and actuators
- Control speed or control program with flexible inhibit and Drive Control Input (DCI) function
- Unparalleled reliability
- On-board battery charger access
- Complies with EU MDD 2007/47/EC by conformance to EN12184:2009
- Conforms to ISO 7176-14: 2008 / ANSI/RESNA WC-2:2009

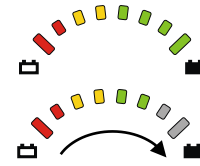
Turning the SHARK on and off

To turn on the SHARK

Press the on/off button.



- All Battery Gauge LEDs turn on one by one.
- After the SHARK has started up successfully, the Battery Gauge shows the charge of the battery.



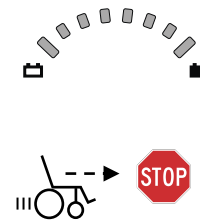
To turn off the SHARK

Press the on/off button.



- The SHARK turns off.

If the on/off button is pressed while the chair is driving, the chair will perform an emergency stop before it turns off.



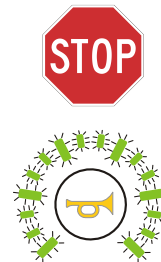
Out Of Neutral At Power Up (OONAPU)



If the SHARK is turned on while the joystick is not in the centre position, an "Out Of Neutral At Power Up" fault occurs.



- During an OONAPU fault the speedometer LEDs flash continuously and the chair will not drive. As soon as the joystick is released back to the centre, the fault goes away and the chair will drive normally.



OONAPU is a feature that prevents sudden and unexpected powerchair movements if the joystick is out of the centre position when the controller is turned on.



Warning:

If an OONAPU error does not go away after the joystick is released, the SHARK may be damaged. Do not use the powerchair and consult a service agent.

Using the SHARK Lock



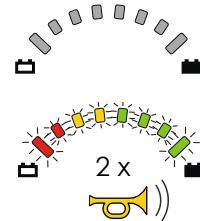
If the **Lock Enable** parameter is set to 'Yes', the SHARK can be locked by pressing the on/off button for more than 4 seconds. Lock the SHARK to prevent unauthorized persons from operating the chair.

To lock the SHARK

Press the on/off button for 4 seconds when the SHARK is turned on.



- The SHARK turns off immediately when the on/off button is pushed.
- After 4 seconds all LEDs of the battery gauge will flash twice and the horn will give two short beeps, to indicate that the SHARK is now locked.



To unlock the SHARK

Press the on/off button.



- The SHARK will turn on, and the LEDs of the battery gauge will slowly flash from right to left to indicate that the SHARK is locked.



Press the horn button twice within 10 seconds.

2 x



- The SHARK will turn on normally.

If the horn button is not pressed within 10 seconds, the SHARK will turn off again.



Waking up from Sleep Mode



The SHARK will go to sleep after a period without joystick movement. This period can be set with the **Sleep Timer** parameter. When the SHARK sleeps, it is partially turned off to reduce energy consumption and to make sure that the powerchair does not move when the user accidentally moves the joystick.

To wake up the SHARK



Press the on/off button only*, or press any button on the SHARK or move the joystick**.



- The SHARK turns on.



When a programmer is connected to the SHARK, the SHARK will not go to sleep. If the SHARK goes to sleep during charging, the charging of the battery will continue.

* If the **Wakeup Style** parameter is set to 'Buttons'

** If the **Wakeup Style** parameter is set to 'Joystick and Buttons'

Driving

Using the Joystick

Move the joystick.



- The powerchair starts to drive in the direction of the joystick movement.
- The amount of joystick movement determines the speed of the powerchair. If the joystick is moved further from the centre, the powerchair will drive faster.



Adjust the maximum drive speed



You can adjust the maximum speed of the chair to your preference or environment. The currently selected top speed is shown on the Speedometer.

Using the Speedometer



The function of the Speedometer depends on the value of the **Speedo Display** parameter.

Max Speed Only

The speedometer shows the maximum speed that has been set with the speed buttons.

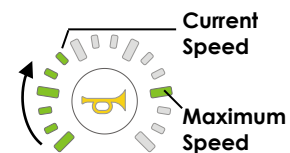


Speedo Plus Max Speed

The speedometer shows the current chair speed together with the maximum speed that has been set with the speed buttons.

When the joystick is deflected and the speed of the chair increases, the LEDs will turn on one by one until the maximum speed (that has been set with the speed buttons) is reached.

If the bottom-left GREEN LED is flashing, SHARK is in speed limit mode. This happens when the chair is in an unstable position and driving too fast may be dangerous, for example when the seat is raised or tilted. See the Installation Manual of the SHARK Power Module for further details on how to limit the speed when the chair is not stable.



Using the Horn



Press the horn button.

- The horn will sound as long as the button is pressed.



Reading the Battery Gauge

Battery charge indication

The Battery Gauge indicates how much battery charge remains.

Battery Gauge	Meaning
	Battery full.
	Battery half full. Start the return journey.
	Battery low. Recharge soon.
	Battery almost empty. Recharge now.
	Flash Code 2 fault: battery completely empty. Battery damage will occur if you keep on driving. Recharge immediately.

The remaining battery capacity does not translate directly to remaining physical range of the powerchair. The remaining physical range depends on the ambient temperature, the capacity and age and state of the battery, the driving style of the user and the terrain that the powerchair is being used in. Most of these factors can vary between, or within, one journey.

Other indications

Apart from the remaining battery charge, the Battery Gauge also indicates the following conditions.

Battery Gauge	Meaning
	Drive Inhibit, the chair will not drive. For example, when a charger is connected to the SHARK. The LEDs turn on one by one from left to right.
	A fault has occurred. All LEDs turn on one by one from left to right to indicate that the chair will not drive. The Fault Indicator LED will show the corresponding Flash Code.
	Flash Code 2 fault: battery too full. Slow down if you are driving down a slope. Turn on the lights, if fitted.

Battery charging

The 3-pin XLR battery charging socket is located on the front of the SHARK. If the chair has an On-board Battery Charger (OBC), plug the OBC power cable into a power outlet. The powerchair does not drive when the batteries are being charged. Only use the battery charger provided by your dealer.

When the SHARK is turned on during charging, the LEDs of the battery gauge will swap between showing the approximate battery charge, and turning on one by one from left to right to indicate that the powerchair will not drive.



When the Battery Charger shows a 'full' battery charge, you can remove the charger from the SHARK. Do not use the indication on the battery gauge. Only use the indication on the battery charger itself to see when charging is complete.



Note:

1. It is recommended to leave the SHARK off while charging when possible. A load during charging (for example, the use of seating functions) causes a temporary voltage drop in the battery. This causes some battery chargers to think that the battery is still empty while it is actually fully charged. Depending on the specifications of the battery charger, this can result in overcharging and possible battery damage. Read the manual of your battery charger for more information.
2. Overcharging dramatically decreases the lifespan of a battery.
3. If SHARK is turned off or goes into sleep mode while charging, charging will continue.

Using the Seating Functions



In the Seating Mode the joystick does not drive the chair; it selects and operates the seating functions instead.

Activate the Seating Mode



Press the Seat Function button to activate Seating Mode.

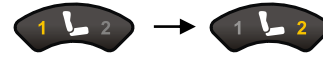
- The Seating Mode starts with Seat Function 1 selected (If Seat Function 1 is enabled.).
The '1' on the Seat Function button becomes illuminated.



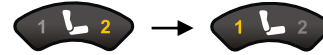
Select the Seat Function



Press the Seat Function button or move the joystick right to select Seat Function 2.



Move the joystick left to select Seat Function 1.



Operate the Seat Function



Move the joystick forward to operate the Seat Function in one direction.



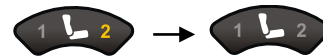
Move the joystick in reverse to operate the Seat Function in the opposite direction.

If you move the joystick further away from the centre position, the Seat Function moves faster (if the **Seat Control Type** parameter is set to 'Proportional').

Return to the Driving Mode



Press the Seat Function button until both '1' and '2' are not illuminated to return to Driving Mode.



Note:

All joystick navigation and operation requires deflection past the value of the **Joystick Switch Threshold** parameter, except in proportional mode.

Using the Lights

To operate the lights



Press the side light button to switch the side/positioning lights on or off.



- The side light LED is on when the sidelights are switched on.



To operate the indicators



Press the indicator buttons to switch the indicators on or off.

- The indicator LEDs flash at the same rate as the indicator lights.

The indicators will switch off automatically, if the

Indicator Auto-cancel parameter does not have the value 'Off':

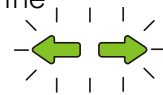


To operate the hazard lights



Press the hazard light button to switch the hazard lights on or off.

- Both indicator LEDs flash together at the same rate as the indicator lights.



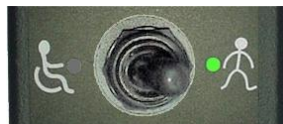
Operating Attendant Mode



Attendant Mode is selected when the User/Attendant switch on the DK-ACU Attendant Control module is set to 'Attendant'. In Attendant Mode, the Attendant Control LED is on.

In Attendant Mode, the joystick of the REMD will not operate. Only the joystick on the DK-ACU is operational.

See the DK-ACU Installation Manual for further details.



DK-ACU in Attendant Mode



Attendant Control LED is on

How to...

How to set the speedometer

If your SHARK remote has a speedometer display, it can be used in two different display modes:

- **Max Speed Only**, or
- **Speedo Plus Max Speed**.

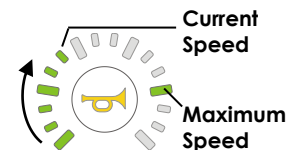
Max Speed Only Display

If the speedometer is set to display **Max Speed Only**, the speedometer shows the maximum speed that has been set with the speed buttons.



Speedo Plus Max Speed Display

If the speedometer is set to display **Speedo Plus Max Speed**, the speedometer shows the current chair speed together with the maximum speed that has been set with the speed buttons. When the joystick is deflected and the speed of the chair increases, the LEDs will turn on one by one until the maximum speed (that has been set with the speed buttons) is reached.



To set the remote to display the speedometer with either **Max Speed Only**, or **Speedo Plus Max Speed**, use the Wizard to set the General Settings parameter “**Speedo Display**” to either *Max. Speed Only* or *Speedo plus Max. Speed* (see figure below).

General Settings	
Lowest Forward Speed (%)	10
Lowest Turn Speed (%)	10
Emergency Deceleration (%)	60
Active Drive Program	Program 1
Sleep Timer (min)	0
Wakeup Style	Buttons
Lock Enable	No
Joystick Throw	Normal
Joystick Switch Threshold (%)	40
Field Programmability	Full
Speedo Display	Max. Speed Only
Speed Button Sensitivity	Max. Speed Only
Indicator Auto-cancel	Speedo plus Max. Speed
Beep on Keypress	Yes

How to use the virtual speed pot

The SHARK remote uses the speed buttons as a virtual speed pot. These can be used to increase and decrease the speed of the powerchair in both standard steps, and fine steps. Using fine steps can be particularly useful for matching the chair speed to the walking speed of an accompanying pedestrian.

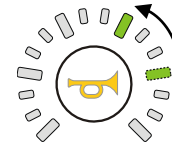


To increase / decrease the speed



Slower

Press and release the 'slower' button to decrease the maximum speed of the chair by 20 %.
Press and hold the 'slower' button to decrease the maximum speed of the chair in fine steps*.



Faster

Press and release the 'faster' button to increase the maximum speed of the chair by 20 %.
Press and hold the 'faster' button to increase the maximum speed of the chair in fine steps*.



The **Speed Button Sensitivity** parameter sets how quick the maximum speed increments or decrements when a speed button is held down.

* If adjusting the speed in fine steps does not work, simultaneously hold down the 'slower' and 'faster' buttons for 2 seconds to activate fine speed control. The SHARK will beep when the mode has been changed.

How to improve load compensation for low speeds

Load compensation automatically compensates for changes in motor speed when the chair drives over loads such as sidewalks, curbs or slopes. If the chair performs poorly on carpet or at low speeds, the most probable cause is a **Load Compensation** value that is set too low.

The table below shows the behaviour and effects on a powerchair system for different values of **Load Compensation**.

		Load compensation		
		Too low	Correct	Too high
Chair behaviour		<ul style="list-style-type: none"> • Drives like it is going through thick mud • Slows down when it goes up a sidewalk edge or up a ramp • Slows down with heavier users • Changes direction when it drives over a bump • Changes direction when the weight of the user shifts. 	<ul style="list-style-type: none"> • Drives smoothly • Keeps the speed reasonably constant. Only slightly slows down on a slope. • Keeps the direction constant. Only slightly changes direction when it drives over a bump. 	<ul style="list-style-type: none"> • Drives very rough • Hard to steer or control, vibrates • Swerves when it drives over a bump. • Motor becomes hotter than normal very easily, decreased motor life

To improve load compensation for low speeds, set the value of the **Load Compensation** parameter to the correct motor resistance value of the used motor. The Load Compensation parameter can be found by connecting the SHARK system to a PC or laptop, and running the Wizard application. Read the program from the connected controller by pressing the Wizard button shown to the left.



The **Load Compensation** parameter is located in the **Drive Programs** section (see figure below).

Drive Programs			
	Program 1	Program 2	Program 3
Drive Program Name	No Chair Tamer	Med Chair Tamer	Hi Chair Tamer
Maximum Forward Speed (%)	100	100	100
Forward Acceleration (%)	25	25	25
Forward Deceleration (%)	55	55	55
Maximum Reverse Speed (%)	40	40	40
Reverse Acceleration (%)	30	30	30
Reverse Deceleration (%)	55	55	55
Maximum Turn Speed (%)	30	30	30
Turn Acceleration (%)	20	20	20
Turn Deceleration (%)	60	60	60
Tremor Damping (%)	40	40	40
Load Compensation (mOhm)	100	100	100
Max Load Compensation (mOhm)	400	400	400
Active Stability Profile	Profile 1	Profile 3	Profile 4
Traction (%)	0	0	0

How to change Load Compensation

To change the Load Compensation value, click on one of the Program columns for Load Compensation as outlined in red in the figure above. Change the value by typing in a new value. Finally, press the 'Write to controller' button (see image right) at the top of Wizard to write the new program to the controller.



How to set Load Compensation to the correct value

1. Set **Load Compensation** to 20.
2. Write the new value to the controller.
3. Drive the powerchair onto a slope.
4. If the powerchair rolls back after it has stopped on the slope increase the **Load Compensation**.
5. Write the new value to the controller.
6. Repeat steps 3, 4 & 5 until the powerchair does not roll back.



Notes:

1. This test procedure can cause the motor to become hot. For this reason, the resulting value for **Load Compensation** is too high. Reduce the found Load Compensation by 20 %, and perform a driving test when the motors are cold to make sure that the powerchair is still comfortable to drive.
2. A new motor usually has a higher motor resistance than a motor that has been used for some time, because the motor brushes that are inside the motor do not make optimal contact until they are "worn in". If possible, perform this procedure when the motor has been used for several hours.

How to configure a short-throw joystick

If the powerchair user has difficulty moving the joystick to full deflection, then the joystick can be re-configured for short-throw operation.

Normally the SHARK controller will drive at full speed only when the joystick is pushed as far as it can mechanically go, that is, when it hits the restrictor plate.

To reduce the amount of deflection required of the joystick, set the **Joystick Throw** parameter in Wizard to:

- **Short**, or
- **Very Short**

Setting **Joystick Throw** to **Short** or **Very Short** increases the sensitivity of the joystick so that less movement of the joystick is required to generate full speed. This can be useful to allow users with very little hand movement full proportional control.



Warning:

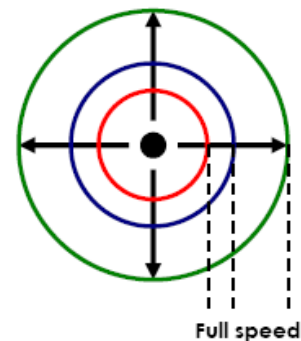
Setting **Joystick Throw** to **Short** or **Very Short** can introduce a **safety risk**, because the mechanical restrictor plate does not restrict the movement of the joystick anymore before full forward or turn speeds are achieved. It may be possible to demand full forward speed and full turn speed at the same time. This can be dangerous.

When **Joystick Throw** is set to **Short**, the user only needs to push the joystick to 50% of its normal deflection to obtain full-speed.

When **Joystick Throw** is set to **Very Short**, the user only needs to push the joystick to 33% of its normal deflection to obtain full-speed.

The **Joystick Throw** parameter can be found under the **General Settings** section in Wizard, as shown below.

Normal	- 100 %
Short	- 50 %
Very Short	- 33 %



General Settings	
Lowest Forward Speed (%)	10
Lowest Turn Speed (%)	10
Emergency Deceleration (%)	60
Active Drive Program	Program 1
Sleep Timer (min)	0
Wakeup Style	Buttons
Lock Enable	No
Joystick Throw	Normal
Joystick Switch Threshold (%)	Normal
Field Programmability	short
Speedo Display	Very Short
Speed Button Sensitivity	5
Indicator Auto-cancel	5 sec

How to read powerchair-specific information

It is often useful to know the details and history of a powerchair system, especially for maintenance or fault finding purposes. In this section of the 'How to...' we will show you how to obtain information for both the Remote and Power Module, such as:

- Serial numbers
- Time powered up
- Number of times driven
- Software versions
- Diagnostics



To read this information, simply connect your PC to the powerchair remote and open the Wizard application. At the top-right of Wizard you will see an icon with a wrench as shown in the image above. Click on this icon once, and the Wizard will read the system's diagnostic information. Scroll down the screen until you get to the **System Information** section (see image below) to see the powerchair-specific information.

System Information	
Remote Serial Number	1280
Remote Month of Manufacture	December
Remote Year of Manufacture	2010
Remote Type	2
Remote Software Version	37
Power Module Unique ID	25
Power Module Month of Manufac...	January
Power Module Year of Manufacture	2010
Time powered up (hours)	80
Number of Times Powered Up	61
Number of Times Driven	77
Flash Code	No event
Diagnostic	No event

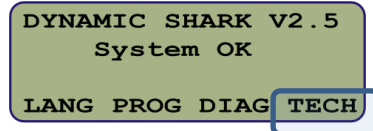
How to swap an active program in the field

The active Drive Program defines the driving performance of the powerchair; in the SHARK power module, three default programs have already been defined for you.

If the active program does not suit your user, then you can quickly change the active Drive Program using the HHP (see steps 1 & 2 below). Furthermore, once you have chosen the most appropriate Drive Program, you can then (optionally) customise it further, using the HHP, for each user (see step 3).

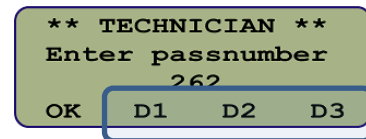
Step 1 – select Technician mode

Connect the HHP to the powerchair, and switch the powerchair on. You will be presented with the HHP start-up screen with the four soft-keys (**LANG**, **PROG**, **DIAG**, and **TECH**) at the bottom of the display. Press the **TECH** soft-key to enter the **Technician** mode.



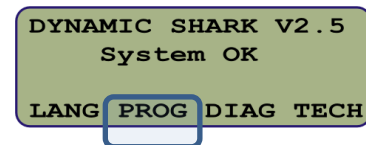
Step 2 – enter password

Enter the password (262) using the D1-D3 soft-keys. Press the **OK** soft-key when the password has been entered. After pressing OK, the start-up screen will be shown again.



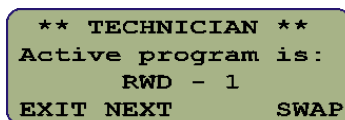
Step 3 – select Program mode

Now that we have technician access, press the **PROG** soft-key to access the Program mode.



Step 4 – select the active program

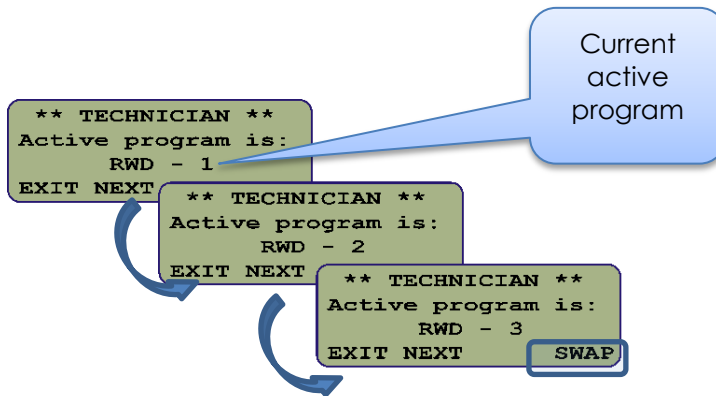
In **Program** mode, notice that the soft-keys have changed to: **EXIT**, **NEXT**, and **SWAP**. The current Drive Program is also displayed. In the example below, it is called "RWD - 1".



To swap an active program, simply press the **SWAP** soft-key.

In the example below, the Drive Program was originally set to the default program called "RWD - 1". After pressing the SWAP button once, the Drive Program is set to "RWD - 2". Pressing SWAP once more sets the active program to "RWD - 3".

When you have chosen the Drive Program, press the **EXIT** soft-key to finish.

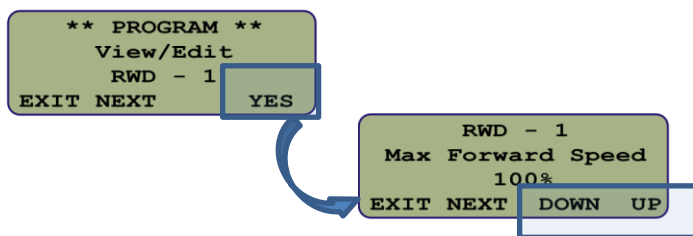


Step 5 – customise Drive Program (optional)

Each Drive Program can be customised further using the HHP, to suit your user's needs.

After you have selected the appropriate Drive Program (steps 1 - 4, above), cycle the power on the controller to exit the Technician mode.

Press the **PROG** soft-key to enter the Program **View/Edit** mode, and then press the **YES** soft-key to enter the edit mode.



This will enable you to view and edit the following parameters:

Parameter	Range	Default
Maximum Forward Speed	0-100 %	100 %
Forward Acceleration	0-90 %	40 %
Forward Deceleration	30-100 %	60 %
Maximum Reverse Speed	0-100 %	70 %
Reverse Acceleration	0-90 %	35 %
Reverse Deceleration	30-100 %	70 %
Maximum Turn Speed	0-90 %	50 %
Turn Acceleration	0-90 %	40 %
Turn Deceleration	20-100 %	60 %
Tremor Damping	10-100 %	40 %

To edit a parameter, use the **UP / DOWN** soft keys to change its value.

To view and/or edit another parameter, press the **NEXT** soft-key.

When you have completed the parameter customisation, press the **EXIT** soft-key.

Troubleshooting Guide

When troubleshooting a powerchair system, follow the three-part steps outlined below.

Part 1: Check the battery voltage.

Part 2: Check for possible “Flash Code” on remote.

Part 3: Check for other conditions displayed by the controller.

These steps are detailed more fully in the following pages.

Part 1 Check the battery voltage.

When troubleshooting a powerchair, battery voltage is always the first thing to check. Check the battery voltage through the 3-pin battery charger port located on the front of the controller.

- Set voltmeter to the 50 volt dc (V dc) scale.
- Place the leads into the two outside pins of the battery charger port as shown in the image to the right.
- Measurement should be approximately 25 V dc



If the voltage is 20V dc or less:

- A battery charger may not recognize an extremely low voltage and will not charge the batteries.
- You will need a dealer to boost charge the batteries to bring the voltage up to a level that the charger will see, then, plug the battery charger into the chair and recharge the batteries for at least 8 hours.

If you are unable to charge the batteries, you will need to replace BOTH batteries.

If the voltage is below 25V dc:

- Recharge batteries for at least 8 hours.
- Check that the wiring is not damaged and that all cables are connected properly.

Check that the pins are seated in the connectors properly and the fuses are good.

If the voltage is dropping too quickly, perform a load test on the batteries as follows:

- Place the voltmeter leads into the two outside pins of the battery charger port, as shown. Sit in the powerchair and drive it.
- After an initial drop, the voltage will hold steady at approximately 24V dc or higher when driving with a load in the chair.

If the voltage continues to drop while driving, BOTH the batteries will need to be replaced.



Part 2 Check “Flash Code” on remote.

If a fault condition exists, the Fault Indicator LED shows a Flash Code.

A flash code is a specific number of short flashes, followed by a pause.



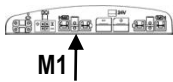

If the fault is a serious fault that prevents the chair from driving, the Battery Gauge shows a 'Drive Inhibit' indication.



If you connect an HHP during a fault condition, the fault log will show a 4-digit code. The first two digits provide the fault code number. The second two digits provide the sub-code for more specific diagnostics information.

Flash Code	Fault source	Sub-code	Meaning & Remedy
1	User	00	<p>Out Of Neutral At Power Up (OONAPU)</p> <ul style="list-style-type: none"> Release the joystick to the center and try again <p>Motor overload (too steep)</p> <ul style="list-style-type: none"> The motor is not strong enough, try an alternative route <p>Controller is locked</p> <ul style="list-style-type: none"> Unlock controller <p>Stalled condition</p> <ul style="list-style-type: none"> Turn the controller off and then back on. This will reset the controller fault and you will be able to drive again. <p>Thermal rollback</p> <ul style="list-style-type: none"> Allow the controller to sit for approximately 15 min. to cool down. Turn the controller off then on and you will be able to continue driving. If this problem happens often while driving in ideal conditions, there may be a problem with the powerchair. Check for sticking park brake or motor problems

Flash Code	Fault source	Sub-code	Meaning & Remedy
2	Battery	00	<p>Voltage too high or too low</p> <ul style="list-style-type: none"> Check the batteries and the cables Batteries may be empty: charge the batteries Batteries may be overcharged: if driving downhill, slow down Batteries may be damaged: replace the batteries

Flash Code	Fault source	Sub-code	Meaning & Remedy
3	Motor 1 	00	Short circuit <ul style="list-style-type: none"> • Check the motor cables for damage • Motor brushes may be too stiff, bouncing against the case <ul style="list-style-type: none"> ◦ Replace motor brushes or motor
4	Motor 2 		
		01	Open circuit <ul style="list-style-type: none"> • Check if the motor cables are loose • Motor brushes may be worn <ul style="list-style-type: none"> ◦ Turn wheels to reconnect ◦ Replace motor brushes or motor
		02	Motor terminal connected to battery negative (-) <ul style="list-style-type: none"> • Check if the motor has been connected correctly • Check the motor cables for damage
		03	Motor terminal connected to battery positive (+) <ul style="list-style-type: none"> • Check if the motor has been connected correctly • Check the motor cables for damage
		04	Motor voltage not consistent during drive <ul style="list-style-type: none"> • Possible motor short circuit <ul style="list-style-type: none"> ◦ check the motor cables for damage ◦ Motor brushes may be too stiff and bouncing • Otherwise internal controller fault, contact Dynamic Controls
		06	Intermittent short circuit <ul style="list-style-type: none"> • Check for damaged cables • Motor brushes may be too stiff, bouncing against the case <ul style="list-style-type: none"> ◦ Replace motor brushes or motor
		All other	Internal fault <ul style="list-style-type: none"> • Contact Dynamic Controls

Fault finding motor problems:

1 Swap the M1 and M2 motor connectors (if motor connectors are un-keyed):

- Plug the M1 motor into the M2 motor connector and M2 motor into the M1 motor connector.
- If the flash code stays the same, then the fault is in the controller. If the flash code changes to the opposite motor then the fault lies in the motor.

2 Check the resistance of the left and right motors to determine if the fault is in the motor or the controller:

- Set your meter to the 20 Ohm scale.
- Touch the leads together to make sure the ohm meter is accurate. You should have approximately 0 ohms at this point.
- Place the red and black ohm meter leads on the two outside pins of the connectors on the motors as shown.
- The meter should read between 0.3 and 5 ohms.



Any reading outside this range represents a bad motor that should be replaced.

3 Check the resistance of the M1 and M2 motor connectors on the controller:

- Disconnect the battery from the controller.
- Set your meter to the 200 ohm scale.
- Touch the leads together to make sure the ohm meter is accurate. You should have approximately 0 ohms at this point.
- Place the red and black ohm meter leads on the two outside pins of the M1 and M2 motor connectors on the controller as shown.
- The meter should read approximately 22k ohms.
- Any reading outside this range represents a bad controller that should be replaced.



4 If the measurement is within this range, and the controller still displays a flash code, check that the wiring is not damaged and that all cables are connected properly. Make sure all pins are seated properly in their connectors.

5 If after performing the previous tests and the motor fault persists, the controller will need to be returned

Flash Code	Fault source	Sub code	Meaning & Remedy
5	Park brake 1	00	Drive-time test failed. • Check the park brake cables
6	Park brake 2	01	Park brake not connected or broken • Check if the cables of the park brake are loose
		02	Park brake short circuit or broken • Check the park brake cables for damage

		03	Fault during power-up testing <ul style="list-style-type: none"> • Check if the cables of the park brake are loose or damaged
		04	Park brake short circuit or broken <ul style="list-style-type: none"> • Check the park brake cables for damage

Notes for Flash Codes 5 & 6:

1 Check to see if the park brake lever is disengaged:

- If disengaged, re-engage park brake lever and turn power off and back on to reset flash code.

2 Check the resistance of the left and right park brakes to determine if the fault is in the park brake or the controller:

- Set your meter to the 200 ohm scale.
- Touch the leads together to make sure the ohm meter is accurate. You should have approximately 0 ohms at this point.
- Place the red and black ohm meter leads on the two middle pins of the motor connector as shown.

The meter should read between 40-80 ohms.



Any reading outside this range represents a bad park brake that should be replaced.

3 If the measurement is within this range, and the controller is still displaying a flash code, check that the wiring is not damaged and that all cables are connected properly. Make sure all pins are seated properly in their connectors.

4 If after performing the previous tests and the park brake fault persists, the controller will need to be returned.

5 If the measurement is within this range, and the controller is still displaying a flash code, check that the wiring is not damaged and that all cables are connected properly. Make sure all pins are seated properly in their connectors.

6 If after performing the previous tests and the park brake fault persists, the controller will need to be returned.

Flash Code	Fault source	Sub code	Meaning & Remedy
7	Remote	04 05	Attendant remote fault <ul style="list-style-type: none"> • Check attendant remote cables for damage • Disconnect and reconnect attendant remote • If the fault doesn't go away, disconnect the attendant remote as a temporary solution and contact Dynamic Controls
		All other	Internal fault <ul style="list-style-type: none"> • Contact Dynamic Controls

Notes for Flash Code 7:

1 Holding down the power for a time greater than 4 seconds while powering up will cause the remote to display this flash code. This is not a fault but a safety feature designed to detect if the power button is working properly. The power button is your emergency stop button for the chair.

To erase the fault, turn the remote off and then back on to reset the flash code and the chair will be able to drive again.

2 Check the battery voltage. Refer to Part 1 for measuring the battery voltage.

3 Check that the wiring is not damaged and that all cables are connected properly.

4 Make sure all pins are seated properly in their connectors.

5 If after performing the previous tests and the fault still persists, or if the remote will not turn off, the controller will need to be returned.

Flash Code	Fault source	Sub code	Meaning & Remedy
8	Power module	13	Actuator fault <ul style="list-style-type: none"> • Check the actuator and the actuator cables
		14	Lighting fault <ul style="list-style-type: none"> • Check the light bulb and the lighting cables
		All other	Internal fault <ul style="list-style-type: none"> • Contact Dynamic Controls

Flash Code	Fault source	Sub code	Meaning & Remedy
9	Comm-unication	00	Loss of communication between remote and power module <ul style="list-style-type: none"> • Check for possible low battery • Check for loose connectors or a damaged cable • Check for worn motor brushes
		01	Limp mode caused by unreliable communication <ul style="list-style-type: none"> • Check for loose connectors or a damaged cable • Check for worn motor brushes

		02	Loss of communication with attendant remote <ul style="list-style-type: none"> • Disconnect and reconnect attendant remote and try again • Check the attendant remote cables • If the fault doesn't go away, disconnect the attendant remote as a temporary solution and contact Dynamic Controls
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Flash Code	Fault source	Sub code	Meaning & Remedy
10	Internal fault	00	<ul style="list-style-type: none"> • Contact Dynamic Controls

Flash Code	Fault source	Sub code	Meaning & Remedy
11	Wrong remote	00	Incompatible remote connected <ul style="list-style-type: none"> • Check that the brand on the remote and the power module are the same

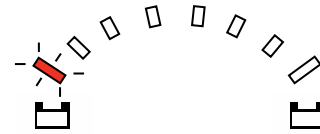
Notes for Flash Code 11:

1 Ensure the branding of the controller matches that of the remote.

Part 3 Check for other conditions displayed by the controller

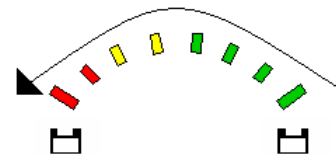
1 The left red LED flashing on the battery gauge signifies an extremely low battery charge:

- Charge the batteries for at least 8 hours.
- Refer to Step 1 for measuring the battery voltage.
- If after performing the previous tests and the flashing still persists, the controller will need to be returned.



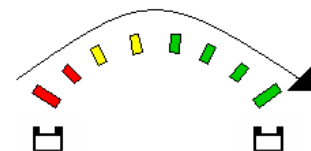
2 A right-to-left LED chase on the battery gauge signifies that the Shark is in a locked state:

- To un-lock the Shark, turn the controller on and press the horn button twice within ten seconds.



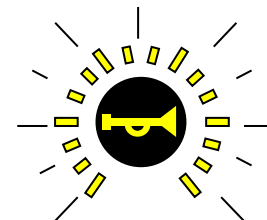
3 A left-to-right LED chase on the battery gauge signifies that the Shark is in a charge inhibit:

- Remove the battery charger from the charging port
- If the flashing still persists after the charger has been removed, the controller will need to be returned.



4 When all speedometer LEDs are flashing slowly, the Shark has detected an Out Of Neutral At Power Up (OONAPU) condition:

- Release the joystick back to the neutral position.
- If the flashing still persists, calibrate the joystick using the Hand Held Programmer (DX-HHP):
 - Using the DK-Adapter (DK-ADAPT), plug the DX-HHP into the battery charging port.
 - Select "TECH" and enter password: 262. Press "OK".
 - Press "PROG" until the phrase "Calibrate Joystick?" appears on the screen.
 - When asked to "Calibrate Joystick?" select "YES"
 - Deflect the joystick in each of the directions displayed by the DX-HHP until the "#" symbol appears next to the word. Do this twice.
 - When the calibration has been completed, press



“EXIT”, turn the controller off then on.

- If after performing the previous tests and the flashing LEDs persist, the controller will need to be returned.

Using HHP diagnostics

The HHP (Hand-held Programmer) can provide a quick and easy way to view the SHARK system's faults and usage statistics.

Simply plug in the HHP (using a DK-ADAPT adapter) and power-up the SHARK system. With the use of the soft keys you can view:



- Current faults
- Usage statistics:
 - Time on – number of hours the system has been run
 - Powered – number of times the system has been powered up
 - Driven – number of times the system has been driven

Step 1 – View Diagnostics

Plug the HHP into the SHARK remote (using a DK-ADAPT adapter) and power-up the SHARK system.

The HHP will display the main menu screen as shown on the right.

```
DYNAMIC SHARK V2.5
System OK
LANG PROG DIAG TECH
```

At the bottom of the screen you can see the current soft keys – **LANG**, **PROG**, **DIAG**, and **TECH** (this menu changes from screen to screen, depending on the mode). Press the soft key marked **DIAG** to take you to the Diagnostics screen.

Step 2 – View Fault Log

The diagnostic screens display current* and past faults. The first screen shows the current fault. Historical faults are stored in the **Fault log**.

Press the **NEXT** soft key to view the Fault log.

```
** DIAGNOSTICS **
System Fault 0503
Left Park Brake Flt
EXIT NEXT
```

Step 3 – View Time On Usage Statistics

The Fault log is displayed a page at a time. To view older faults, press the **MORE** soft key.

To view **Usage Statistics**, press the **NEXT** soft key.

```
** DIAGNOSTICS **
Fault log - page 1
0603/0503
EXIT NEXT MORE
```

Step 4 – View Powered Usage Statistics

The first usage statistic is **Time on** which displays the number of hours the system has been run.

Press the **MORE** soft key to view more statistics.

```
** DIAGNOSTICS **
Usage Statistics
Time on :2:15
EXIT NEXT MORE
```

Step 5 – View Driven Usage Statistics

The next usage statistic is **Powered** which displays the number of times the system has been powered up.

Press the **MORE** soft key to view more statistics.

```
** DIAGNOSTICS **
Usage Statistics
# Powered: 10
EXIT NEXT MORE
```

Step 6 – Exit Usage Statistics

The final usage statistic is **Driven** which displays the number of times the system has been driven.

Press the **EXIT** soft key to leave the **Usage Statistics** screen and return to Diagnostics.

```
** DIAGNOSTICS **
Usage Statistics
# Driven: 21
EXIT NEXT MORE
```

Further reading

Dynamic Controls SHARK DK-PM(x) Installation Manual (GBK80262)
Dynamic Controls SHARK DK-REMA Installation Manual (GBK80260)
Dynamic Controls SHARK DK-REMB Installation Manual (GBK80261)
Dynamic Controls SHARK DK-REMD/REMDB Installation Manual (GBK80258)
Dynamic Controls SHARK DK-ACU Installation Manual (GBK80257)

For a complete list of programming and wiring information for the SHARK system, see the Power Module Installation Manual (GSM80262).

Glossary

ACU	Attendant Control Unit – an optional remote for the use by an attendant
Drive Program	Defines the drive performance of the powerchair
Fault Codes	A four-digit value indicating a fault – viewed with HHP, or Wizard
Flash Codes	A sequence of flashes on the Remote indicating an abnormal condition
HHP	Hand-Held Programmer and diagnostics tool – used for reading and changing parameters
Joystick	The lever on the remote used to control both driving and other operations such as moving the seats
LED	Light Emitting Diode
OBC	On-board Battery Charger
OONAPU	Out Of Neutral At Power Up – a fault condition which prevents the powerchair moving because the joystick is not in the centre position
SHARK system	The powerchair controller system
Wizard	A PC-based programmer and diagnostics tool
XLR	An industry standard socket used for charging the SHARK system

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Dynamic Controls is the world's leading manufacturer of electronic controls for power wheelchairs and scooters.

Dynamic Controls was established in 1972 and is headquartered in New Zealand.

Regional centres are located in Europe, United States, Asia, and Australasia.

ISO 13485 certified –

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