PG DRIVES TECHNOLOGY

R-NET- TECHNICAL MANUAL

SK77981/12

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ABOUT THIS MANUAL

The Technical Manual gives an introduction to the R-net Control System.

Throughout the manual icons are used to draw the reader's attention.

The icons used are:

Note - A general point for best practice.

Caution - A point of safety which if ignored could result in damage to the Control System or the vehicle.

Warning - A point of safety which if ignored could cause injury to the individual.

PG Drives Technology accepts no liability for any losses of any kind if the points are not followed.

CHAPTER 1 - OPERATION

1 INTRODUCTION

The relevant contents of this chapter should be included in the wheelchair's operating guide. Further copies are available from PGDT in either written or disk (Word) format. Copies should not be made without the express permission of PG Drives Technology.

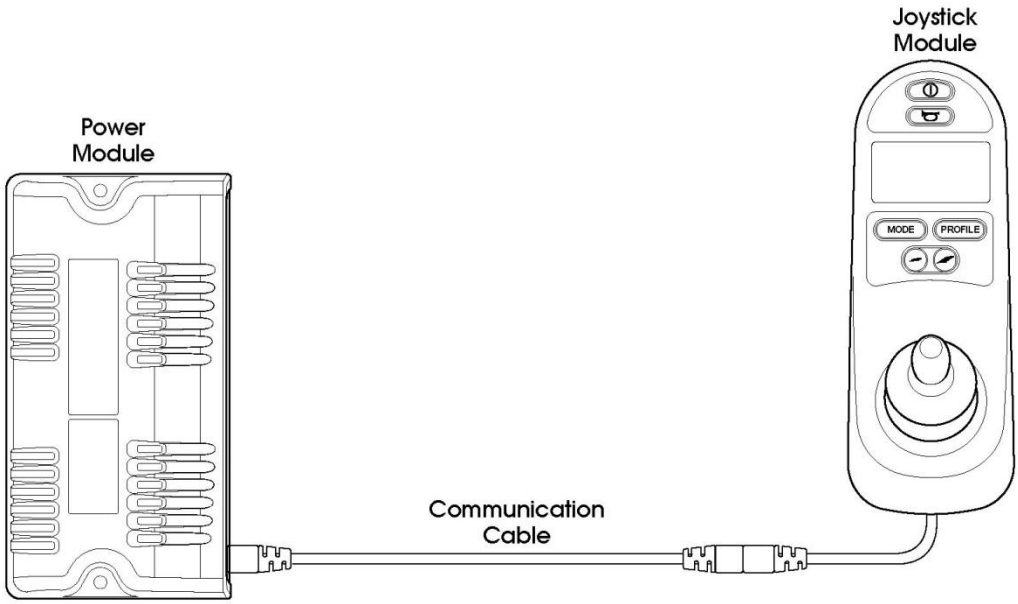
The operation of the R-net varies dependent on programming. This chapter covers all types of operation. It is the responsibility of the wheelchair manufacturer to ensure that only the relevant sections of this chapter are included in the wheelchair's operating manual.

The operation of the R-net wheelchair control system is simple and easy to understand. The control system incorporates state-of-the-art electronics, the result of many years of research, to provide you with ease of use and a very high level of safety. In common with other electronic equipment, correct handling and operation of the unit will ensure maximum reliability.

Please read this chapter carefully - it will help you to keep your wheelchair reliable and safe.

2 GENERAL

An R-net control system comprises a minimum of two modules - Joystick Module and Power Module. Because of the modular design, the depth of the control system can be greatly increased. The following diagram shows the basic set-up.



2.1 HANDLING

Avoid knocking your control system and especially the joystick. Be careful not to strike obstacles with the control system or joystick when you drive. Never drop the control system.

When transporting your wheelchair, make sure that the control system is well protected. Avoid damage to cables.

2.2 OPERATING CONDITIONS

Your control system uses industrial-grade components throughout, ensuring reliable operation in a wide range of conditions. However, you will improve the reliability of the control system if you keep exposure to extreme conditions to a minimum.

Do not expose your control system or its components to damp for prolonged periods. If the control system becomes contaminated with food or drink clean it off as soon as possible.

2.3 CLEANING

Clean the control system and the joystick with a cloth dampened with diluted detergent. Be careful when cleaning the joystick and screen.

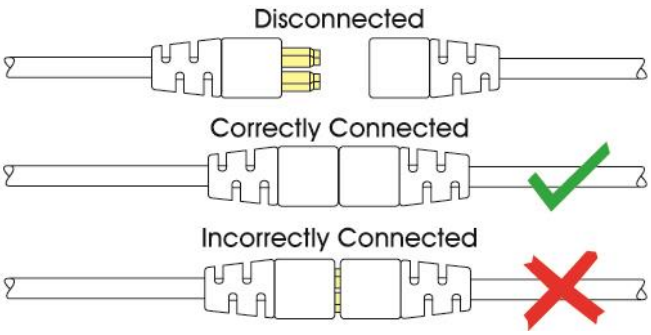
Never use abrasive or spirit-based cleaners.

3 MATING CONNECTORS

To connect the Communication Cables:

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

The connectors are secured using a friction system.



To disconnect the Communication Cables:

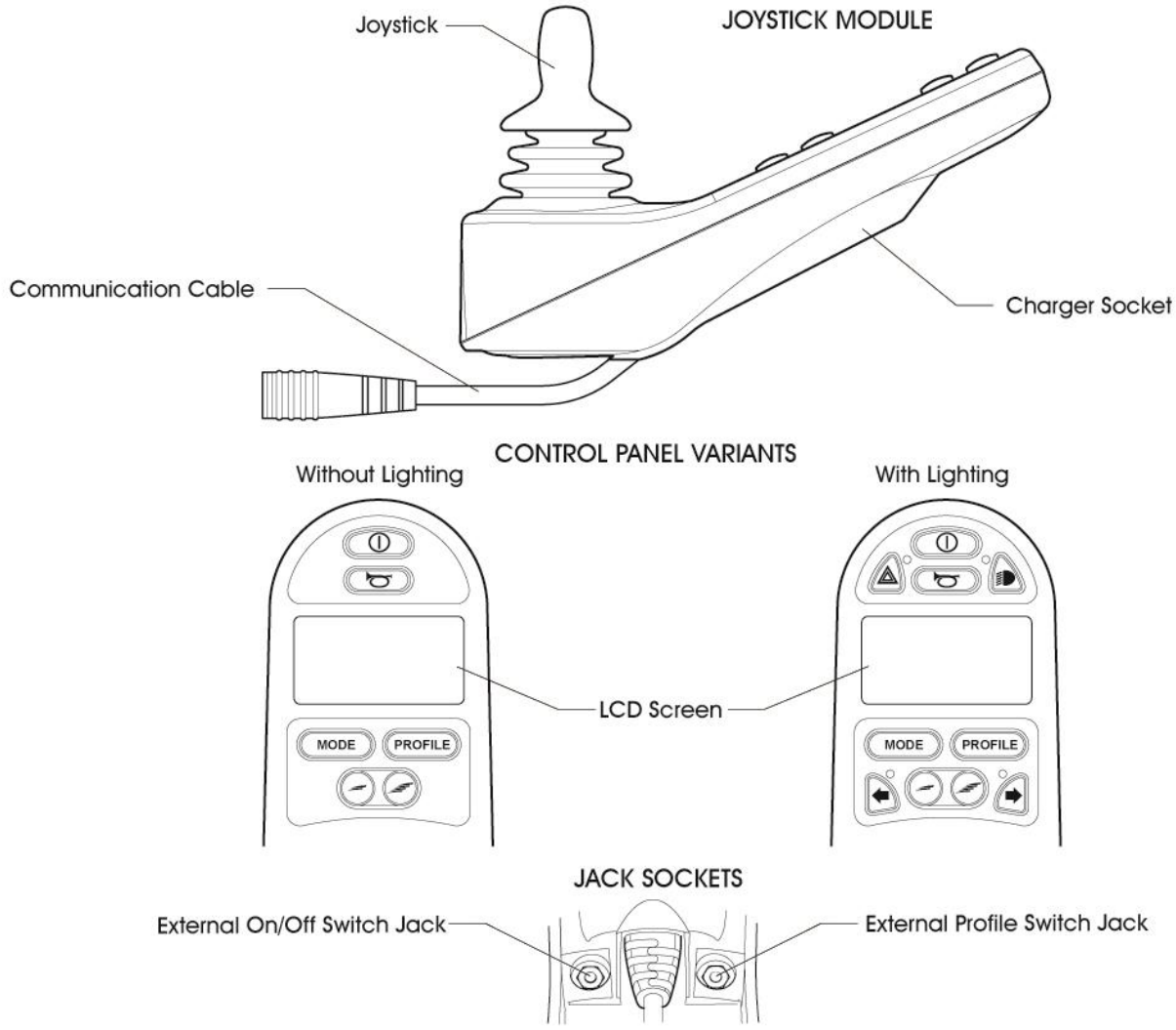
- Holding the connector housing firmly, pull the connectors apart.

Do not hold or pull on the cable. Always grip the connector when connecting and disconnecting.

When the control system is first switched on after a connection, or system component change the Timer will be displayed whilst the system checks itself and then the Re-start icon will be displayed. Switch the control system off and on again to operate.

4 CONTROLS

The R-net control system has two versions of Joystick Module – with and without lighting control. Most of the controls are common to both however, the lighting buttons are only included on the Joystick Module with lighting control. Each of the controls is explained within this section.

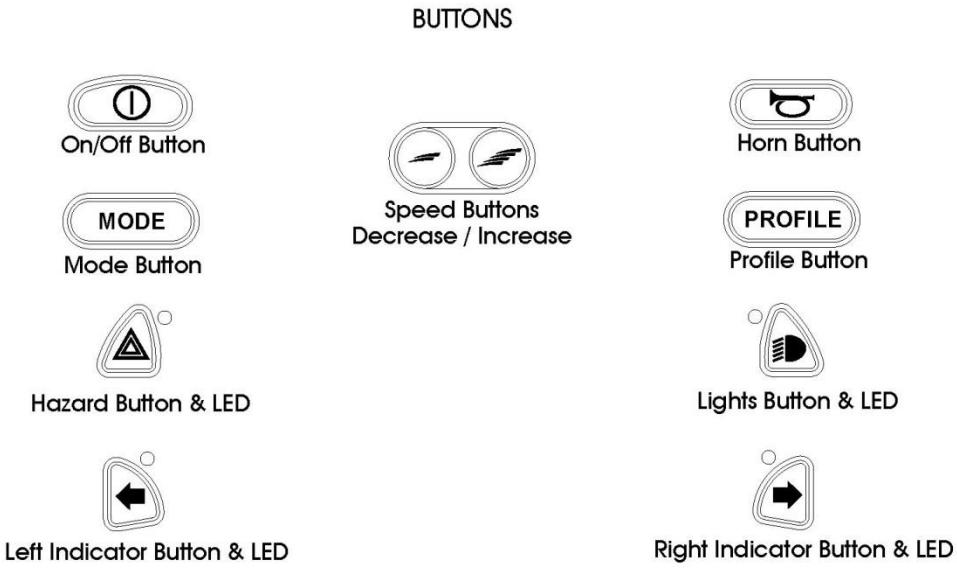


4.1 JOYSTICK

The primary function of the joystick is to control the speed and direction of the wheelchair. The further you push the joystick from the center position the faster the wheelchair will move. When you release the joystick the brakes are automatically applied.

If the wheelchair is fitted with actuators, the joystick can also be used to move and select actuators, refer to section 5.5 for more details.

4.2 BUTTONS



4.2.1 ON/OFF BUTTON

The On/Off button applies power to the control system electronics, which in turn supply power to the wheelchair's motors. Do not use the On/Off button to stop the wheelchair unless there is an emergency. (If you do, you may shorten the life of the wheelchair drive components).

4.2.2 HORN BUTTON

The Horn will sound while this button is depressed.

4.2.3 SPEED DECREASE BUTTON

This button decreases the maximum speed setting.

Depending on the way the control system has been programmed a momentary screen may be displayed when the button is pressed.

Refer to section 5 for details of the momentary screen.

Refer to Chapter 3 - Programming for details.

4.2.4 SPEED INCREASE BUTTON

This button increases the maximum speed setting.

Depending on the way the control system has been programmed a momentary screen may be displayed when the button is pressed.

Refer to section 5 for details of the momentary screen.

Refer to Chapter 3 - Programming for details.

4.2.5 MODE BUTTON

The Mode button allows the user to navigate through the available operating Modes for the control system. The available modes are dependent on programming and the range of auxiliary output devices connected to the control system.

Refer to Chapter 3 - Programming for details.

4.2.6 PROFILE BUTTON

The Profile button allows the user to navigate through the available Profiles for the control system. The number of available Profiles is dependent on how the control system is programmed.

Depending on the way the control system has been programmed a momentary screen may be displayed when the button is pressed.

Refer to section 5 for details of the momentary screen.

Refer to Chapter 3 - Programming for details.

4.2.7 HAZARD WARNING BUTTON AND LED

This button activates and de-activates the wheelchair's hazard lights. Depress the button to turn the hazards on and depress the button again to turn them off.

When activated the hazard LED and the indicator LEDs will flash in sync with the wheelchair's indicators.

4.2.8 LIGHTS BUTTON AND LED

This button activates and de-activates the wheelchair's lights. Depress the button to turn the lights on and depress the button again to turn them off.

When activated the lights LED will illuminate.

4.2.9 LEFT INDICATOR BUTTON AND LED

This button activates and de-activates the wheelchair's left indicator. Depress the button to turn the indicator on and depress the button again to turn it off.

When activated the left indicator LED will flash in sync with the wheelchair's indicator(s).

4.2.10 RIGHT INDICATOR BUTTON AND LED

This button activates and de-activates the wheelchair's right indicator. Depress the button to turn the indicator on and depress the button again to turn it off.

When activated the right indicator LED will flash in sync with the wheelchair's indicator(s).

4.2.11 EXTERNAL ON/OFF SWITCH JACK

This allows the user to turn the control system on and off using an external device, such as a buddy button.

4.2.12 EXTERNAL PROFILE SWITCH JACK

This allows the user to select Profiles using an external device, such as a buddy button.

To change the Profile whilst driving simply press the button.

If the control system is set to latched drive or actuator control operation, then the polarity of the jack input is reversed to effect a fail safe system; meaning this input will provide an External Profile Switch function and an Emergency Stop Switch function.

The Joystick Module is supplied with rubber bungs that must be inserted into the Jack Socket when no external device is connected.

4.3 LCD SCREEN

The status of the control system can be understood by observing the LCD screen. The control system is on when the screen is backlit.

Refer to section 5 for details on screen symbols.

4.4 CHARGER SOCKET

This socket should only be used for charging or locking the wheelchair. Do not connect any type of programming cable into this socket.

Refer to section 13 for more details on charging.

This socket should not be used as a power supply for any other electrical device. Connection of other electrical devices may damage the control system or affect the E.M.C. performance of the wheelchair.

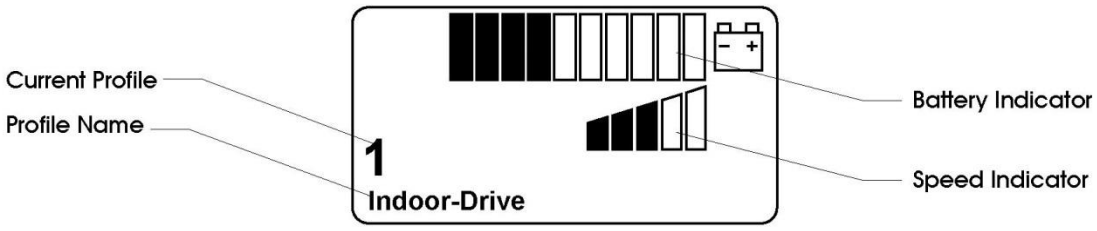
The control system's warranty will be voided if any device other than a battery charger supplied, with the wheelchair, or the lock key is connected into this socket.

5 LCD SCREEN - MONOCHROME

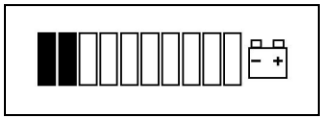
The status of the control system can be understood by observing the LCD screen.

5.1 SCREEN SYMBOLS

The Drive screen for the R-net has common components, which will always appear, and components that will only appear under certain conditions. Below is a view of a typical Drive screen in Profile 1.



5.1.1 BATTERY INDICATOR



This displays the charge available in the battery and can be used to alert the user to the status of the battery.

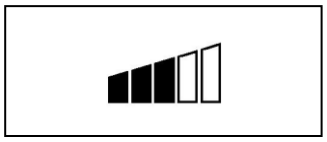
Steady
This indicates that all is well.

Flashing Slowly
The control system is functioning correctly, but you should charge the battery as soon as possible.

Stepping Up
The wheelchair batteries are being charged. You will not be able to drive the wheelchair until the charger is disconnected and you have switched the control system off and on again.

Refer to section 12 for a description of how to read the Battery Gauge.

5.1.2 SPEED INDICATOR



This displays the current speed setting.

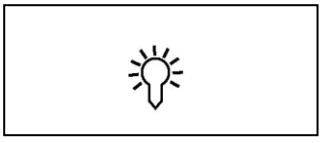
The speed setting is adjusted using the Speed Buttons.

5.1.3 CURRENT PROFILE

The Profile Number describes which Profile the control system is currently operating in.

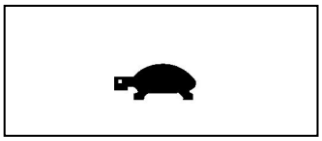
The Profile Text is the name or description of the Profile the control system is currently operating in.

5.1.4 IN FOCUS



When the control system contains more than one method of direct control, such as a secondary Joystick Module or a Dual Attendant Module, then the Module that has control of the wheelchair will display the In Focus symbol.

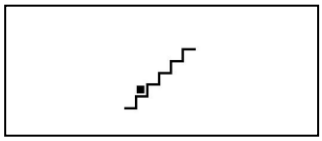
5.1.5 SPEED LIMIT



If the speed of the wheelchair is being limited, for example by a raised seat, then this symbol will be displayed.

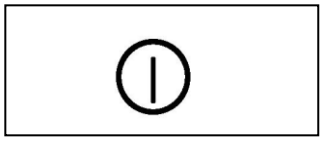
If the wheelchair is being inhibited from driving, then the symbol will flash.

5.1.6 LATCHED



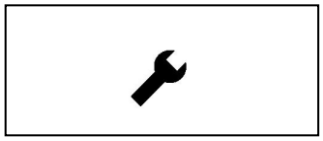
When the control system is operating in a latched condition this symbol will be displayed.

5.1.7 RESTART



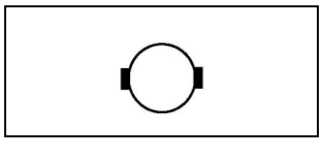
When the control system requires a reboot; for example, after a module re-configuration, this symbol will be flashed.

5.1.8 FAULT



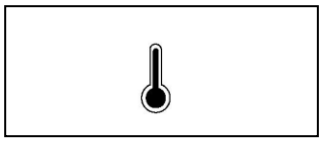
The control system can detect a wide variety of errors. When the system has detected an error that is not severe enough to cause the system to trip, then this symbol will be displayed.

5.1.9 MOTOR TEMPERATURE



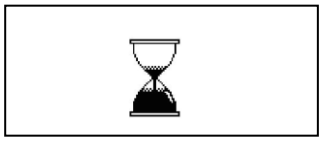
This symbol is displayed when the control system has intentionally reduced the power to the motors, in order to protect them against heat damage.

5.1.10 CONTROL SYSTEM TEMPERATURE



This symbol is displayed when the control system has intentionally reduced its own power, in order to protect itself against heat damage.

5.1.11 TIMER



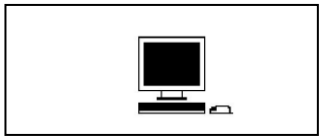
This symbol is displayed when the control system is changing between different states. An example would be entering into Programming Mode. The symbol is animated to show the sands falling.

5.1.12 E-STOP

If the control system is programmed for latched drive or actuator operation, then it is normal for an Emergency Stop Switch to be connected into the External Profile Switch Jack.

If the Emergency Stop Switch is operated or disconnected, this symbol will be displayed.

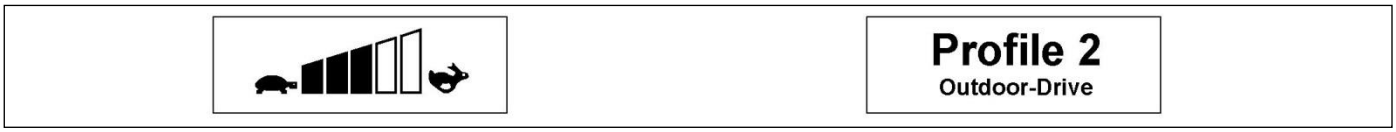
5.1.13 BLUETOOTH



When Bluetooth Mode is entered the screen will display the following icon.

5.2 MOMENTARY SCREENS

If the momentary screens are programmed to be displayed then pressing the Speed or Profile Buttons will display screens such as below.



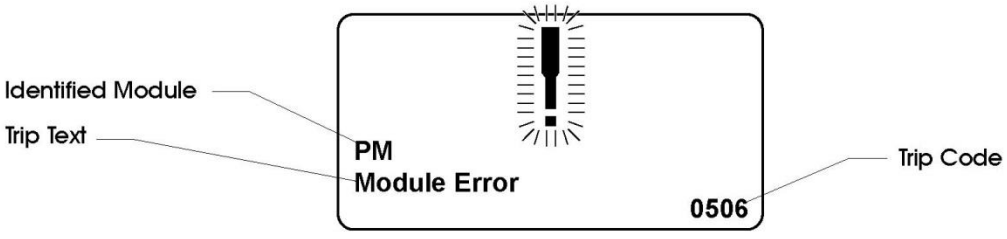
Speed Momentary Screen

Profile Momentary Screen

5.3 DIAGNOSTIC SCREEN

When the control system safety circuits have operated and the control system has been prevented from moving the wheelchair a diagnostics screen will be displayed.

This indicates a system trip, i.e. the R-net has detected a problem somewhere in the wheelchair's electrical system.



If the error is in a non-active module, for example in the ISM but with a drive Profile is selected, then drive will still be possible, however, the diagnostic screen will appear intermittently.

5.3.1 IDENTIFIED MODULE

This identifies which module of the control system has registered the problem, such as:

PM	Power Module
JSM	Joystick Module
ISM	Intelligent Seating/lighting Module

5.3.2 TRIP TEXT

The Trip Text gives a brief description of the trip type.

5.3.3 TRIP CODE

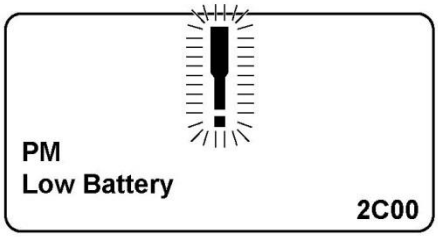
The 4 digit code displayed gives the exact trip that has been recorded.

5.3.4 DIAGNOSTIC PROCEDURE

Please follow this procedure:

- Read and note the Trip Text displayed, the identified Module and the Trip Code.
- Switch off the control system.
- Make sure that all connectors on the listed Module and the wheelchair are mated securely.
- Check the condition of the battery.
- Note the Trip Text description, and take the required action.
- Switch on the control system again and try to drive the wheelchair. If the safety circuits operate again, switch off and do not try to use the wheelchair. Contact your service agent.

Example:



Identified Module	**Power Module**
Trip Text	**Low Battery**
Trip Code	**2C00**

This means the battery needs charging or there is a bad connection to the battery.

- Check the connections to the battery. If the connections are good, try charging the battery.

5.4 LOCKING THE CONTROL SYSTEM

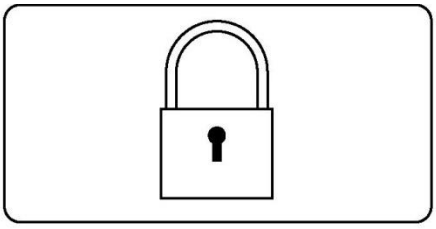
The Control System can be locked in one of two ways.Either using a button sequence on the keypad or with a physical Key. How the Control System is locked depends on how the wheelchair manufacturer has programmed the system.

5.4.1 KEYPAD LOCKING

To lock the wheelchair using the keypad;

- While the control system is switched on, depress and hold the On/Off button.
- After 1 second the control system will beep. Now release the On/Off button
- Deflect the joystick forwards until the control system beeps.
- Deflect the joystick in reverse until the control system beeps.
- Release the joystick, there will be a long beep.
- The wheelchair is now locked.

The following screen will be displayed, the next time the Control System is switched on.



If an LED Joystick Module is fitted the Speed Indicator LEDs will ripple from left to right. Refer to Chapter 4.

To unlock the wheelchair:

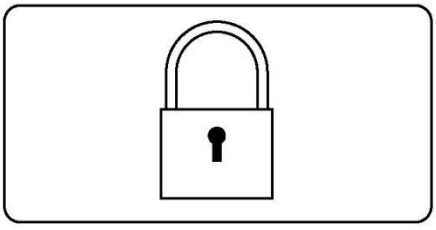
- If the control system has switched off, press the On/Off button.
- Deflect the joystick forwards until the control system beeps.
- Deflect the joystick in reverse until the control system beeps.
- Release the joystick, there will be a long beep.
- The wheelchair is now unlocked.

5.4.2 KEY LOCKING

To lock the wheelchair with a key;

- With the Control System switched on, insert and remove a PGDT supplied key into the Charger Socket on the Joystick Module. A short beep will be heard.
- The wheelchair is now locked.

The following screen will be displayed, the next time the Control System is switched on.



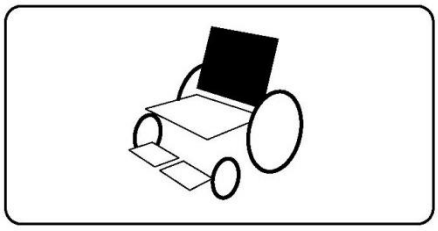
To unlock the wheelchair;

- If the control system has switched off, press the On/Off button.
- Insert and remove a PGDT supplied key into the Charger Socket on the Joystick Module. A short beep will be heard.
- The wheelchair is now unlocked.

5.5 ACTUATOR SELECTION SCREEN

To adjust the seat position the actuator screen must be visible.

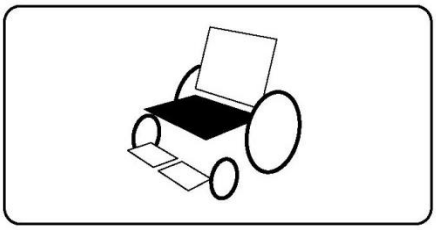
Depress the Mode Button to scroll through the Mode screens until you reach the actuator screen, displayed below.



Actuator adjustment is achieved as follows.

- Move the Joystick sideways to select the desired axis.

  (This is indicated by the section of the wheelchair that is highlighted)
- Move the joystick forwards and backwards to move the actuator.



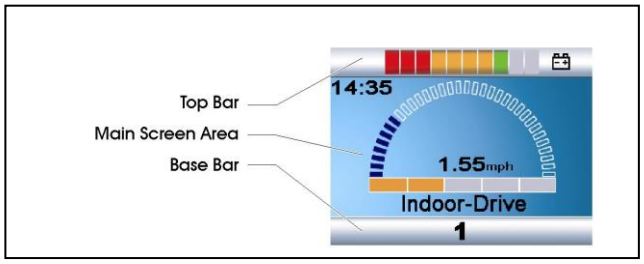
- Repeat these steps for each actuator that requires adjustment.

To drive again depress the Mode button until the Drive screen is reached or, in the case of the LED joystick module, until the Speed Indicator returns to its normal state.

6 LCD SCREEN - COLOR

This section covers those Joystick Modules that are fitted with a color LCD screen.

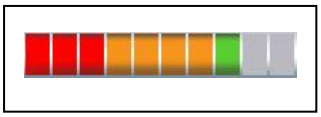
The color LCD screen is split into 3 areas of information. The Top Bar, the Base Bar and the Main Screen Area.



Each area is covered separately within this section.

6.1 TOP BAR

6.1.1 BATTERY INDICATOR



This displays the charge available in the battery and can be used to alert the user to the status of the battery.

Steady: This indicates that all is well.

Flashing Slowly: The control system is functioning correctly, but you should charge the battery as soon as possible.

Stepping Up : The wheelchair batteries are being charged. You will not be able to drive the wheelchair until the charger is disconnected and you have switched the control system off and on again.

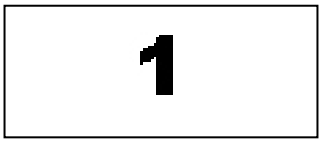
Refer to section 12 for a description of how to read the Battery Gauge.

6.1.2 FOCUS

When the control system contains more than one method of direct control, such as a secondary Joystick Module or a Dual Attendant Module, then the Module that has control of the wheelchair will display the In Focus symbol.

6.2 BASE BAR

6.2.1 CURRENT PROFILE

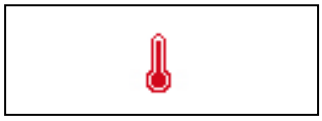


The currently selected Profile is shown in numeric form.

6.2.2 MOTOR TEMPERATURE

This symbol is displayed when the control system has intentionally reduced the power to the motors, in order to protect them against heat damage.

6.2.3 CONTROL SYSTEM TEMPERATURE



This symbol is displayed when the control system has intentionally reduced its own power, in order to protect itself against heat damage.

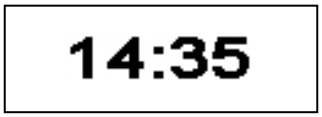
6.3 MAIN SCREEN AREA

Drive Screen

6.3.1 PROFILE NAME

This is a text string that displays the name of the currently selected Profile. The name is programmable. Refer to the programming section for details.

6.3.2 CLOCK



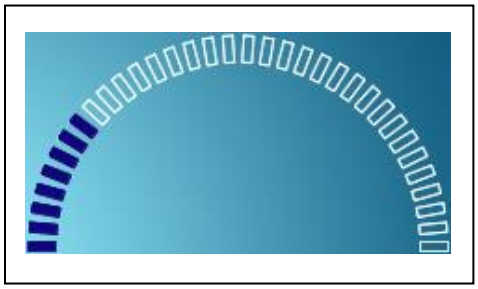
This displays the current time in a numeric format.

The clock is user adjustable. Adjustable options are:

- Visibility, whether the clock is displayed on screen.
- The display format, 12 or 24 hour.
- The time, the user can adjust the time.

These adjustments are made within the Settings Menu. Refer to section 8 for details.

6.3.3 SPEED DISPLAY

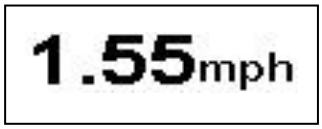


This gives a proportional display of the wheelchairs speed. The Arc begins at 0% and has a programmable maximum. The programmable parameter is Max Displayed Speed. Refer to the Programming Chapter.

6.3.4 MAXIMUM SPEED INDICATOR

This displays the current maximum speed setting.

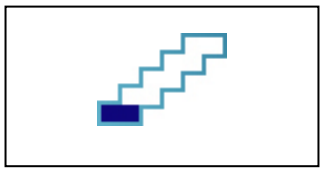
6.3.5 DIGITAL SPEED DISPLAY



This displays the actual speed of the wheelchair derived from the motors. The display can be set to mph or km/h.

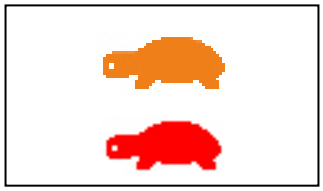
These adjustments can be made in the OBP Menu.

6.3.6 LATCHED



When the control system is operating in a latched condition this symbol will be displayed.

6.3.7 INHIBIT

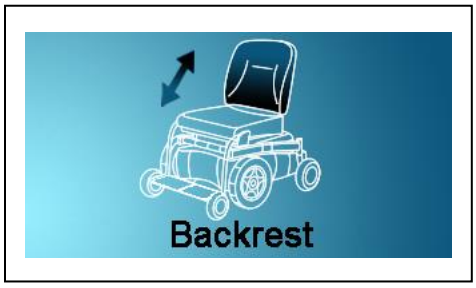


If the speed of the wheelchair is being limited; for example, by a raised seat, then this orange symbol will be displayed.

If the wheelchair is being inhibited from driving, then this red symbol will be flashing.

Mode Screens

6.3.8 ACTUATOR MODE



Displays the sections of the chair currently selected for movement, the name given to the selection and a direction arrow showing what sort of movement is available.

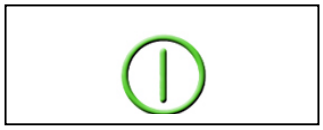
6.3.9 BLUETOOTH MODE

When Bluetooth Mode is entered the following screen will be displayed.

6.4 MESSAGE WINDOW

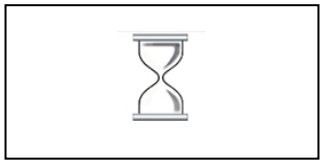
The R-net displays warning icons and informational messages, in a dedicated message window.

6.4.1 RESTART



When the control system requires a reboot; for example, after a module re-configuration, this symbol will be flashed.

6.4.2 TIMER



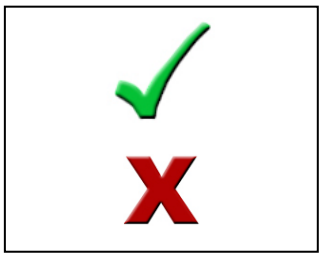
This symbol is displayed when the control system is changing between different states. An example would be entering into Programming Mode. The symbol is animated to show the sands falling.

6.4.3 SLEEP

This symbol will be displayed for a short time before the R-net enters into a sleep state.

6.4.4 CROSS & TICK

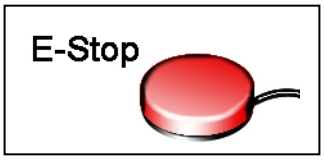
These symbols will be displayed during configuration procedures.



Process completed correctly.

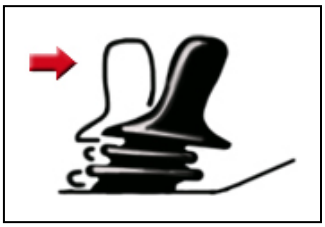
Process not completed correctly.

6.4.5 E-STOP



If the External Profile Switch is activated during drive, or actuator operation, this symbol will be displayed.

6.4.6 JOYSTICK DISPLACED



If you operate the Joystick before or just after you switch the control system on, the screen will flash the joystick displaced screen.

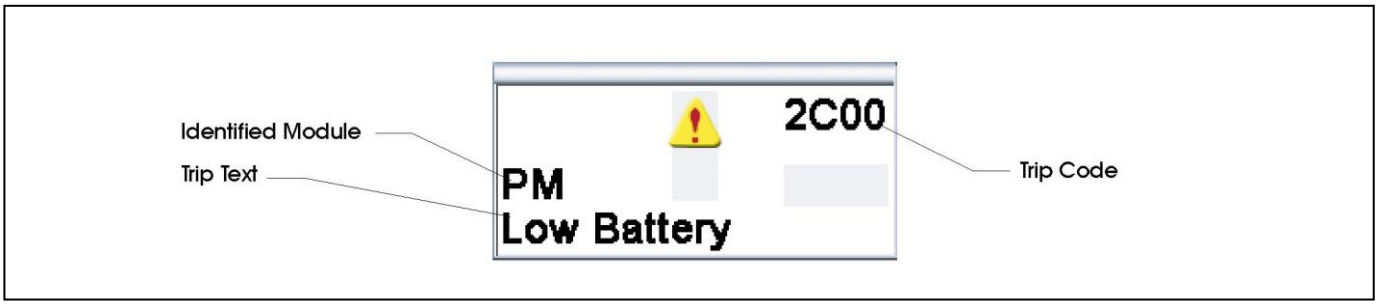
You must release and center the Joystick to resume normal operation. If you do not release the Joystick within five seconds the wheelchair will not be able to move, even if you release the Joystick and operate it again. The screen will display a diagnostic screen at this time. You can reset this condition by switching the control system off and on again.

6.4.7 CONTROL SYSTEM LOCKED

The Control System can be locked in one of two ways. Either using a sequence of deflections and presses with a Joystick or with a physical Key. How the Control System is locked depends on how the wheelchair manufacturer has programmed it.

Refer to Section 5 for a detailed description of the Locking and Unlocking procedures.

6.4.8 DIAGNOSTIC SCREEN



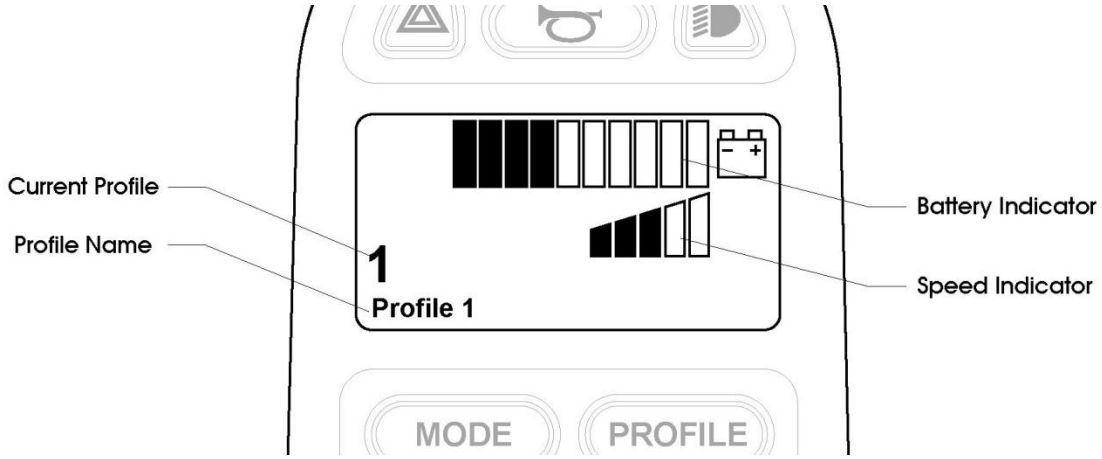
When the control system safety circuits have operated and the control system has been prevented from moving the wheelchair a diagnostics screen will be displayed.

This indicates a system trip, i.e. the R-net has detected a problem somewhere in the wheelchair's electrical system.

Refer to section 5 for a detailed description of Diagnostic screen and procedure. Refer to Chapter 5 Diagnostics for a complete description of the Trip Texts.

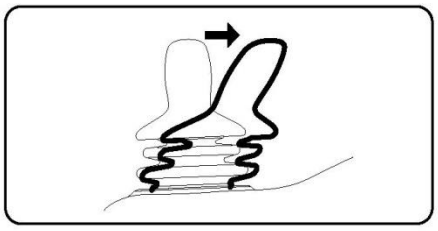
7 GETTING READY TO DRIVE

- Operate the On/Off switch. The screen will go through an initializing process then show the base screen as follows. In the case on an LED Joystick Module the battery gauge will illuminate.

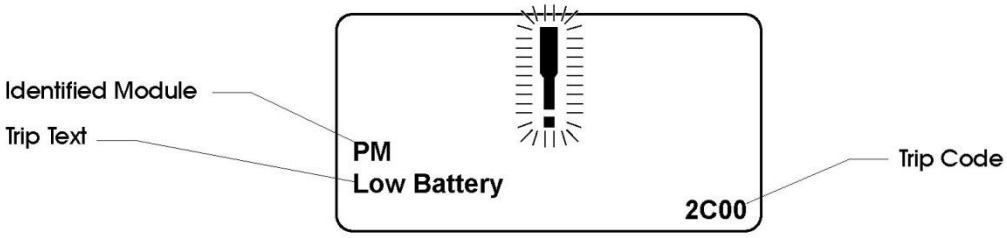


- Check that the Speed Setting is at a level that suits you.
- Push the joystick to control the speed and direction of the wheelchair.

If you push the joystick before or just after you switch the control system on, the screen will flash the joystick displaced screen. You must release and center the joystick to resume normal operation. If you do not release the joystick within five seconds the wheelchair will not be able to move, even if you release the joystick and push it again. The screen will display the diagnostic screen at this time. You can reset this condition by switching the control system off and on again.

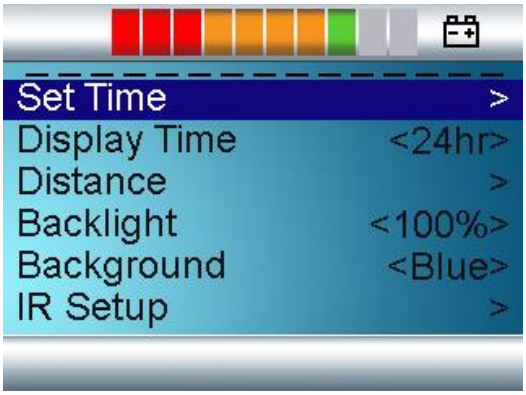


If you do not push the joystick as you switch the wheelchair on and the diagnostic screen is displayed, as in the following diagram, then the R-net has detected a problem somewhere in the wheelchair's electrical system.



8 SETTINGS MENU

The Settings Menu allows the user to adjust the CJSM display in terms of clock adjustment and display format, the brightness of the backlight, the background color and the behavior of the odometer. The menu is accessed by depressing the Speed Down and Speed Up buttons simultaneously. A typical Settings Menu display would be as below.



Each of the menu items are described in the following sections.

8.1 SET TIME

A right joystick deflection will enter a clock adjustment screen in which further joystick deflections are used to set the time.

8.2 DISPLAY TIME

This sets the format of the time display or turns it off.

The options are 12hr, 24hr or Off. Left and right joystick deflections are used to change between the options.

8.3 DISTANCE

This sets the functionality of the odometer and a screen as below will appear.

Total Distance	This is a value held in the Power Module and relates to the total distance driven using that Power Module.

Trip Distance	This is a value held in the CJSM and relates to the total distance driven since the last reset.
Display Distance	Sets whether Total Distance or Trip Distance appears as the odometer display on the CJSM.
Clear Trip Distance	A right joystick deflection will clear the Trip Distance value.
Exit	A right joystick deflection will return to the Settings Menu.

8.4 BACKLIGHT

This sets the intensity of the LCD backlight.

The adjustable range is 0% to 100% in steps of 10%. Adjustments are made with left and right joystick deflections.

8.5 BACKGROUND

This sets the color of the screen background. Blue is the standard, but in very bright sunlight then a white background will make the display more visible.

The options are Blue, White and Auto. Left and right joystick deflections are used to change between the options.

Blue means the background will be blue in all Profiles.

White means the background will be white in all Profiles.

Auto means the color will be set by the programmable parameter, Background, which can be set to be different across the Profiles. For example, blue for the slower Profiles that are for indoor use and white for the faster Profiles intended for outdoor use. For more details of the parameter, Background, refer to the relevant section in the Programming chapter.

8.6 IR SETUP

IR Set up allows the user access the Omni IR (Infra Red) menus. For full details on how to learn, delete and use the IR functions available please refer to the R-net Omni Technical Manual SK78813.

8.7 EXIT

Exits the Settings Menu back to normal operation.

9 TIPS FOR USING YOUR CONTROL SYSTEM

9.1 DRIVING - GENERAL

Make sure that the control system is mounted securely and that the joystick position is correct. The hand or limb you use to operate the joystick should be supported, for example by the wheelchair arm pad. Do not use the joystick as the sole support for your hand or limb - wheelchair movements and bumps could upset your control.

9.2 DRIVING TECHNIQUE

The control system interprets your joystick movements and produces appropriate movements of your wheelchair. You will need very little concentration to control the wheelchair, which is especially useful if you are inexperienced. One popular technique is to simply point the joystick in the direction you want to go. The wheelchair will “home-in” on the direction you push the joystick.

The further you push the joystick away from the rest position, the faster the wheelchair will go. Releasing the joystick will stop the wheelchair.

The intelligent speed control system minimizes the effects of slopes and different types of terrain.

The wheelchair user must be capable of driving a wheelchair safely. PGDT accepts no liability for losses of any kind arising from failure to comply with this condition.

9.3 SLOW OR SLUGGISH MOVEMENT

If the wheelchair does not travel at full speed or does not respond quickly enough, and the battery condition is good, check the maximum speed setting. If adjusting the speed setting does not remedy the problem then there may be a non-hazardous fault. Contact your service agent.

10 PRECAUTIONS FOR USE

In the event of the wheelchair moving in an unexpected way RELEASE THE JOYSTICK. This action will stop the wheelchair under any circumstances.

10.1 HAZARDS

Do not drive the wheelchair:

- Beyond restrictions indicated in your wheelchair user manual, for example maximum inclines, curb height etc.
- In places or on surfaces where a loss of wheel grip could be hazardous, for example on wet grassy slopes.
- If you know that the control system or other crucial components require repair.

Although the R-net control system is designed to be extremely reliable and each unit is rigorously tested during manufacture, the possibility of a system malfunction always exists (however small the probability). Under some conditions of system malfunction the control system must (for safety reasons) stop the chair instantaneously. If there is any possibility of the user falling out of the chair as a result of a sudden braking action, it is imperative that a restraining device such as a seat belt is supplied with the wheelchair and that it is in use at all times when the wheelchair is in motion. PGDT accepts no liability for losses of any kind arising from the unexpected stopping of the wheelchair, or arising from the improper use of the wheelchair or control system.

Do not operate the control system if the chair behaves erratically, or shows abnormal signs of heating, sparks or smoke. Turn the control system off at once and consult your service agent. PGDT accepts no liability for losses of any kind arising from failure to comply with this condition.

Electronic equipment can be affected by Electro Magnetic Interference (EMI). Such interference may be generated by radio stations, TV stations, other radio transmitters and cellular phones. If the chair exhibits erratic behavior due to EMI, turn the control system off immediately and consult your service agent. PGDT accepts no liability for losses of any kind arising from failure to comply with this condition.

It is the responsibility of the chair manufacturer to ensure that the wheelchair complies with appropriate National and International EMC legislation. PGDT accepts no liability for losses of any kind arising from failure to comply with this condition.

The wheelchair user must comply with all wheelchair safety warnings. PGDT accepts no liability for losses of any kind arising from failure to comply with this condition.

11 SAFETY CHECKS

The electronic circuits in your control system have been designed to be extremely safe and reliable. The on-board microcomputer carries out safety checks at up to 100 times per second. To supplement this safety monitoring you should carry out the following periodic checks.

If the control system fails any of these checks, do not use the wheelchair and contact your service agent.

11.1 DAILY CHECKS

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

11.2 WEEKLY CHECKS

Parking brake: This test should be carried out on a level floor with at least one meter clear space around the wheelchair.

Switch on the control system.

Check that the screen remains on after initialization and that the battery gauge is displaying a reasonable amount of charge.

Push the joystick slowly forwards until you hear the parking brakes operate. The chair may start to move.

Immediately release the joystick. You must be able to hear each parking brake operate within a few seconds.

Repeat the test a further three times, pushing the joystick slowly backwards, left and right.

Connectors: Make sure that all connectors are securely mated.

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

Joystick gaiter: Check the thin rubber gaiter or boot, around the base of the joystick shaft, for damage or splitting, check visually only, do not handle the gaiter.

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

11.3 SERVICING

To ensure continued satisfactory service, we suggest you have your wheelchair and control system inspected by your service agent after a period of 1 year from commencement of service. Contact your service agent for details when the inspection is due.

12 BATTERY GAUGE

The battery gauge is included to let you know how much charge is left in your batteries. The best way for you to use the gauge is to learn how it behaves as you drive the wheelchair. Like the fuel gauge in a car, it is not completely accurate, but it will help you avoid running out of “fuel”.

The battery gauge works in the following way:

When you switch on the control system, the battery gauge shows an estimate of the remaining battery charge.

The battery gauge gives you a more accurate reading about a minute after you start driving the wheelchair.

When you replace worn out batteries, fit the type recommended by the wheelchair manufacturer. If you use another type the battery gauge may be inaccurate.

The amount of charge in your batteries depends on a number of factors, including the way you use your wheelchair, the temperature of the batteries, their age and the way they are made. These factors will affect the distance you can travel in your wheelchair. All wheelchair batteries will gradually lose their capacity as they age.

The most important factor that reduces the life of your batteries is the amount of charge you take from the batteries before you recharge them. Battery life is also reduced by the number of times you charge and discharge the batteries.

To make your batteries last longer, do not allow them to become completely flat. Always recharge your batteries promptly after they are discharged.

If your battery gauge reading seems to fall more quickly than usual, your batteries may be worn out.

12.1 HOW TO READ A BATTERY GAUGE

If the battery gauge shows red, yellow and green, the batteries are charged. (Bars 1 – 10)

If the battery gauge shows just red and yellow, then you should charge the batteries as soon as you can. (Bars 1 – 7)

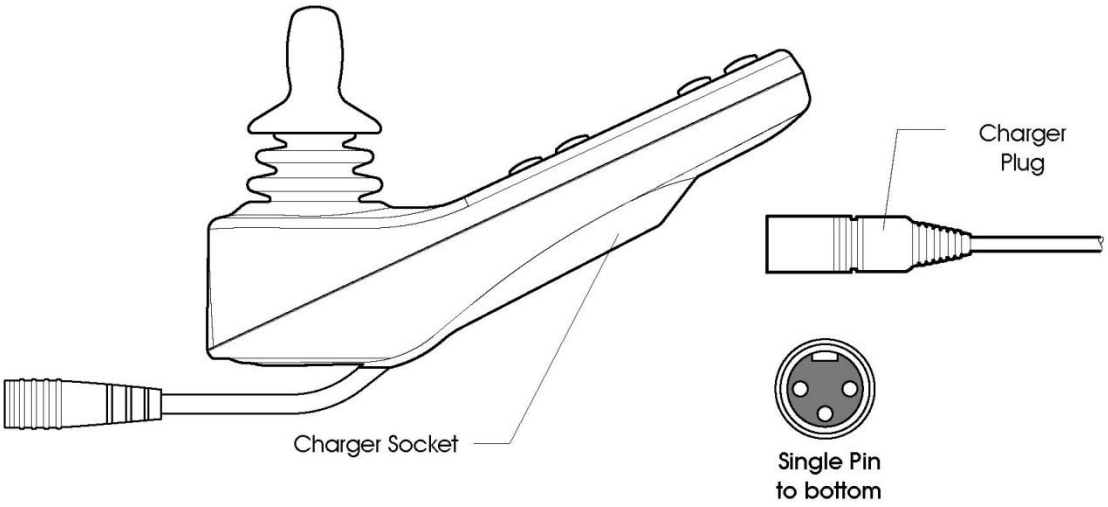
If the battery gauge shows just red, either steady or flashing slowly, then you should charge the batteries immediately. (Bars 1 – 3)

Do not operate the control system if the battery is nearly discharged. Failure to comply with this condition may leave the user stranded in an unsafe position, such as in the middle of a road. PGDT accepts no liability for losses of any kind arising from failure to comply with this condition.

13 BATTERY CHARGING

To charge the wheelchair batteries connect the charger plug into the battery charger socket on the R-net JSM. You will not be able to drive the wheelchair when the charger is connected.

To connect the charger plug, ensure the single pin is at the bottom, as shown in the following illustration, then offer the charger plug to the R-net in a horizontal orientation. The molded guide on the R-net will help you to locate the plug. Ensure the plug is pushed fully in position.



Do not exceed the maximum charging current of 12Arms. Always use an off-board charger fitted with a Neutrik NC3MX plug. Failure to observe these conditions could result in poor contact resistance in the charger connector resulting in overheating of the charger plugs. This presents a potential burn hazard for the user. PGDT accepts no liability for losses of any kind arising from failure to comply with this condition.

Ensure that the charger plug pins are of the correct polarity to be compatible with the pin polarity shown on the control system's specific data sheet. Failure to observe this condition could result in a burn hazard or fire hazard. PGDT accepts no liability for losses of any kind arising from failure to comply with this condition.

Do not disconnect batteries or open-circuit the circuit breaker while charging is in progress. Failure to observe this condition could result in a burns hazard or fire hazard. PGDT accepts no liability for losses of any kind arising from failure to comply with this condition.

Only use the battery charger that has been supplied with your wheelchair. The use of incorrect chargers could damage the batteries, wheelchair, control system or charger itself, or may result in parts overheating creating the potential for burns or even fire. PGDT accepts no liability for losses of any kind if the charger is incompatible with the control system (see Chapter 2, section 7) or any other part of the wheelchair system.

14 PROGRAMMING

The control system can be programmed to meet your needs. Programming can be performed using the OBP (On-board Programming) feature or the specialist R-net software and Dongle or the Diagnostic Test Tool (DTT).

If you re-program your control system, make sure that you observe any restrictions given in your wheelchair user manual. Note any changes you make for future reference.

Programming should only be conducted by healthcare professionals with in-depth knowledge of PGDT electronic control systems. Incorrect programming could result in an unsafe set-up of a wheelchair for a user. PGDT accepts no liability for losses of any kind if the programming of the control system is altered from factory preset values.

15 SERVICING

All repairs and servicing must be carried out by authorized service personnel. Opening or making any unauthorized adjustments or modifications to the control system or its components will invalidate any warranty and may result in hazards to yourself or other people, and is strictly forbidden.

PGDT accepts no liability for losses of any kind arising from unauthorized opening, adjustment or modifications to the R-net control system.

If the control system is damaged in any way, or if internal damage may have occurred through impact or dropping, have the product checked by qualified personnel before operating. PGDT accepts no liability for losses of any kind arising from failure to comply with this condition.

16 WARRANTY

The R-net control system is covered by a warranty period defined by the wheelchair manufacturer. For details of the warranty period, please contact your service agent.

The warranty will be void if the R-net control system has:

- Not been used in accordance with the R-net control system Technical Manual, SK77981.
- Been subject to misuse or abuse.
- Been modified or repaired by non-authorized persons.

The warranty will be void if the R-net has not been used in accordance with Technical Manual SK77981, the R-net has been subject to misuse or abuse, or if the R-net has been modified or repaired by unauthorized persons.

17 JOYSTICK KNOBS

The knob fitted to your joystick is suitable for most applications. If you would prefer another type, there is a range of alternatives available. Please contact your wheelchair distributor or manufacturer for advice. Do not replace the joystick knob with any unauthorized item - it may cause hazardous operation.

Do not replace the joystick knob with any unauthorized item It may cause hazardous operation. PGDT accepts no liability for losses of any kind arising from failure to comply with this condition.