

General Information

This manual provides the necessary information for the installation and operation of the Medi-Link Control Module.

These instructions must be studied before putting the module into operation.

The information contained in this manual is subject to change without notice.

No part of this manual may be photocopied, reproduced, or translated into another language without the prior written consent of EMS Physio Ltd.

Record of Amendments

Control Module Model 70

ISSUE	COMMENTS	DATE
1	Initial Issue	17-03-1994
2	Revised	01-10-1994
3	Revised	01-01-1995
4	CE Marking31-1-96	
5	Revised	01-06-1998
6	Revised	16-01-2001
7	Revised	17-02-2005
8	Revised Company Name	25-09-2006
9	Revised	01-10-2007

EC Declaration of Conformity

EMS Physio Ltd
Grove Technology Park
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OX12 9FE
United Kingdom

Declares that the following medical device is in conformity with the essential requirements and provisions of Council Directive 93/42/EEC and is subject to the procedure set out in Annex 2 of Directive 93/42/EEC under the supervision of Notified Body Number 0120, SGS United Kingdom Ltd.

Product Name Medi-Link Control Module

Model Number 70

Signature



Position Technical Director

Date first issued 31 January 1996

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Warranty

EMS Physio Ltd (hereinafter called the company) product is warranted against defects in materials and workmanship for a period of two years from the date of shipment. The Company will at its option, repair or replace components which prove to be defective during the warranty period, provided that the repairs or replacements are carried out by the Company or its approved agents.

The Company will consider itself responsible for the effects on safety, reliability and performance of the product:-

only if assembly operations, re-adjustments, modifications or repairs are carried out by persons authorised by it,

only if the product is used in accordance with the instructions for use,

only if the electrical installation of the relevant room complies with the appropriate national requirements.

Should the product be returned to the Company for repair it must be sent carriage paid.

Consumable items, for example, self-adhesive electrodes, sponge electrode covers and batteries, are excluded from the above warranty.

Introduction

The Medi-Link is a modular system comprising a Control Module and up to four Application Modules.

It can be either a small, stand alone unit or become a slightly larger combination unit with up to four operating modules, though only two full-power therapy modules may be used at any one time.

In order to ensure total operator and patient safety there are no electrical connections between the Control Module and the Application Modules. These receive their power and instructions via magnetic and infrared interfaces on each module.

A clip-on carrying handle is supplied which also provides storage for ultrasound transducers or laser probes.

The Medi-Link system can easily be upgraded as new applications are released. The carrying handle is removed from the system, the new Application Module attached and the handle replaced. When the system is switched on it automatically detects a new application and re-configures itself. No upgrade of the Control Module is required.

The Medi-Link system has been designed with a universal power supply accepting mains inputs from 100 to 240 volts. It can, therefore, be used anywhere in the world without range switching.

In addition, the Medi-Link has a multi-lingual capability. The operating language of the system may be selected from the Control Module.

Technical Specification

The Medi-Link Control Module is for use only with Medi-Link Application Modules. Up to four Application Modules may be powered by the Control Module, two of which may be therapy modules. Therapy modules must be located either adjacent to the Control Module or next-but-one to the Control Module.

Power Requirements	100 - 240 Volts ac 200VA
Classification	Class 1, Type BF (IEC 601-1)
Display	240 x 128 pixel graphic LCD
Keypad	20 embossed keys with tactile response
Size (height x width x depth)	100 x 180 x 210 mm
Weight	2 kg
Fuses	2 x T2A (5 x 20mm)

All information on model, serial number, and month/year of manufacture is located on the rear panel.

The Medi-Link Control Module is supplied with a detachable mains cable, carrying handle, spare fuses and this manual.

The Medi-Link Control Module has been designed to meet the requirements of IEC 601-1:1988 (BS5724:Part 1:1989) "Medical Electrical Equipment, Part 1: General Requirements for Safety".

Installation

Each Medi-Link module is supplied in a separate carton, with its appropriate accessories and manuals.

Upon receipt, check for any visible damage which may have occurred in transit. If any signs of damage are found then retain all packing material and inform the carrier and the Company or its agent from whom the system was purchased.

If not already fitted, connect a suitable plug to the mains cable. The plug must have provision for an EARTH (GROUND) connection. The mains cable has the following colour code, BROWN is LIVE (LINE), BLUE is NEUTRAL and GREEN/YELLOW is EARTH.

Application Module Installation

Place the Control Module and the Application Module on a flat surface with the Application Module on the right.

Push in the module release button at the top left of the Application Module and slide the module onto the three fixings on the end of the Control Module.

When in position, release the button and the Application Module should latch onto the system. If this does not occur, pressing the modules together should result in the latching action. Although the modules may simply be pressed together, use of the release button is recommended.

If more than one Application Module is to be installed, repeat the above procedure attaching the next module to the previous one. Up to four Application Modules may be used with one Control Module. However, some therapy modules must be located either adjacent to or next-but-one to the Control Module. See the installation section of the Application Module manual for details of whether this rule applies to the particular application.

Finally, attach the carrying handle to the right hand side of the system. This is done by locating the key-hole slots in the handle on the three fixings at the right of the system and pushing the handle down until it "clicks" into position. The release button on the handle prevents the handle from being removed inadvertently.

DO NOT attempt to add or remove modules when the system is on.

Controls and Markings

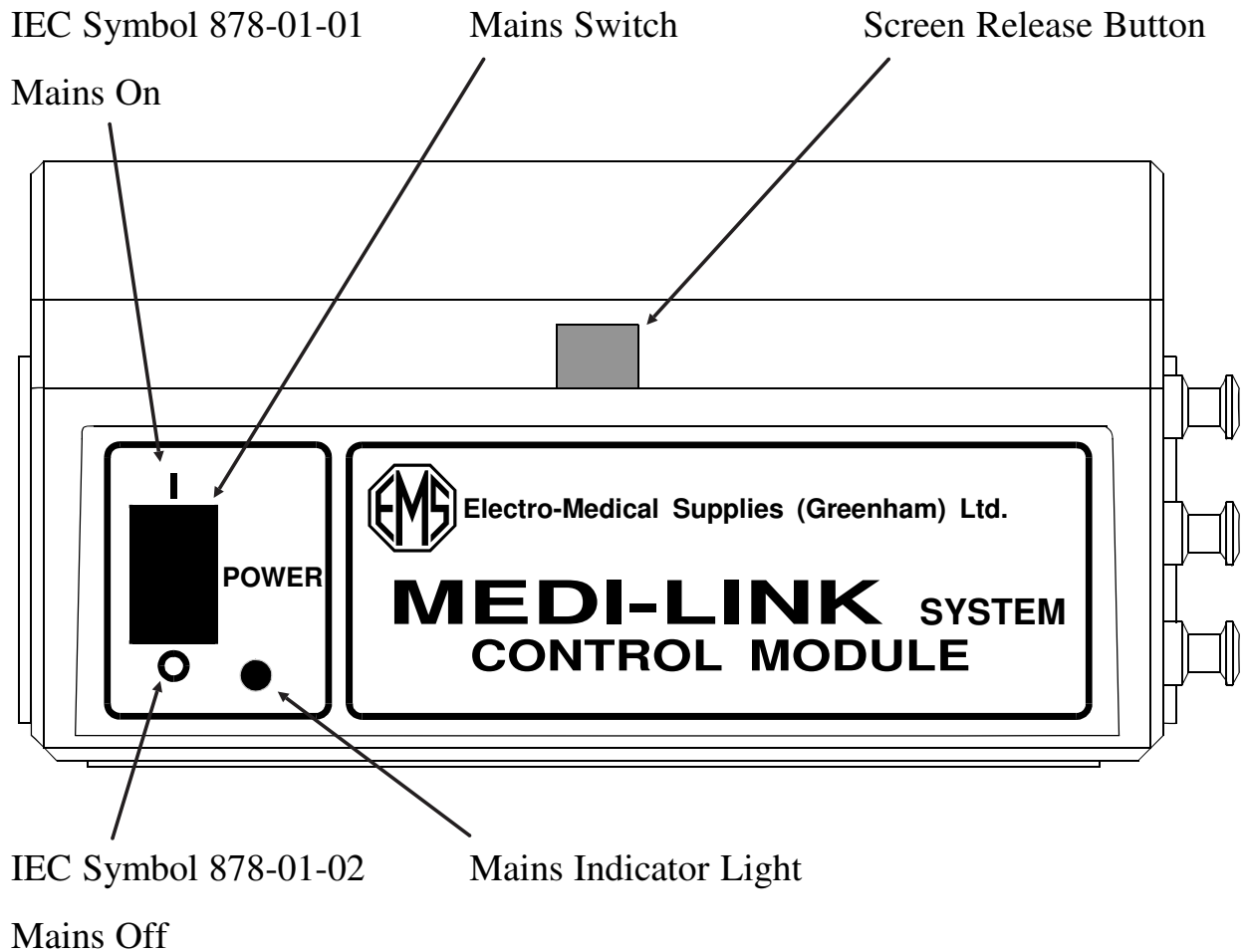


Figure 1 - Control Module Front Panel

The **Screen Release Button** when pressed releases the screen from its closed position.

The **Mains Switch** is a two-position rocker switch: up for on, down for off.

The **Mains Indicator Light** is a green LED which is illuminated when the mains switch is on.

Name and Address of Manufacturer

IEC Symbol 348

Serial Number and Date of Manufacture

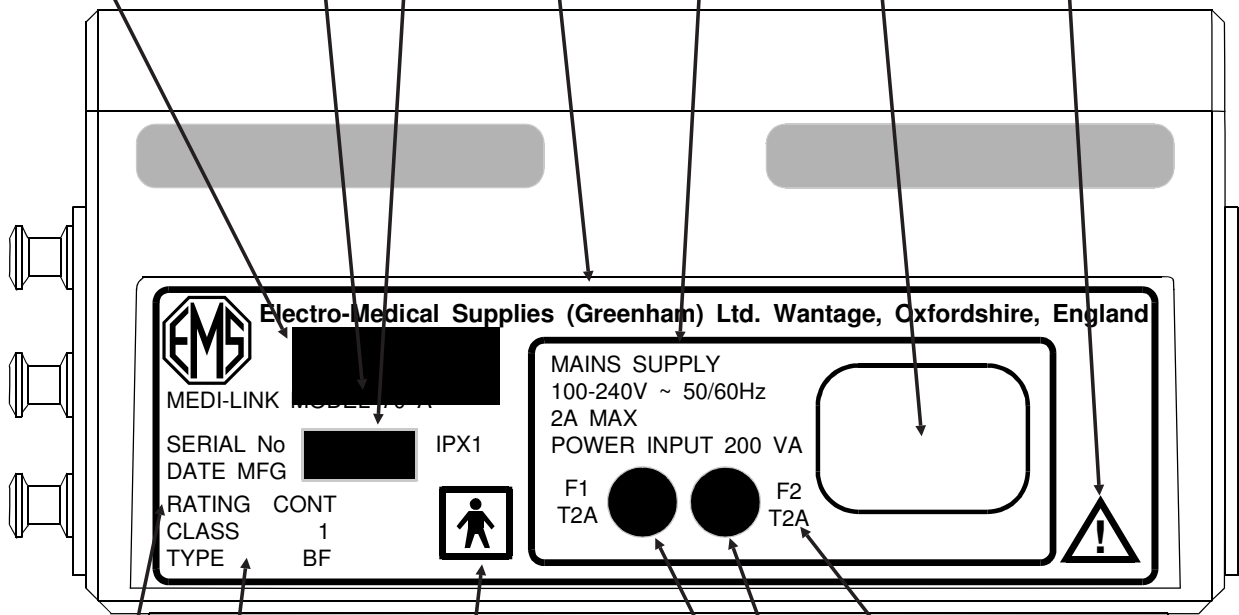
Attention, Consult Accompanying Documents

Model Number

Details of mains supply

CE Mark showing conformity to 93/42/EEC

Mains inlet



Rated for continuous operation

IEC Symbol 878-02-03

Type BF Equipment

Fuse type and rating

Mains Fuses

Classification

Figure 2 - Control Module Rear Panel

Function Keys (F1 - F4)

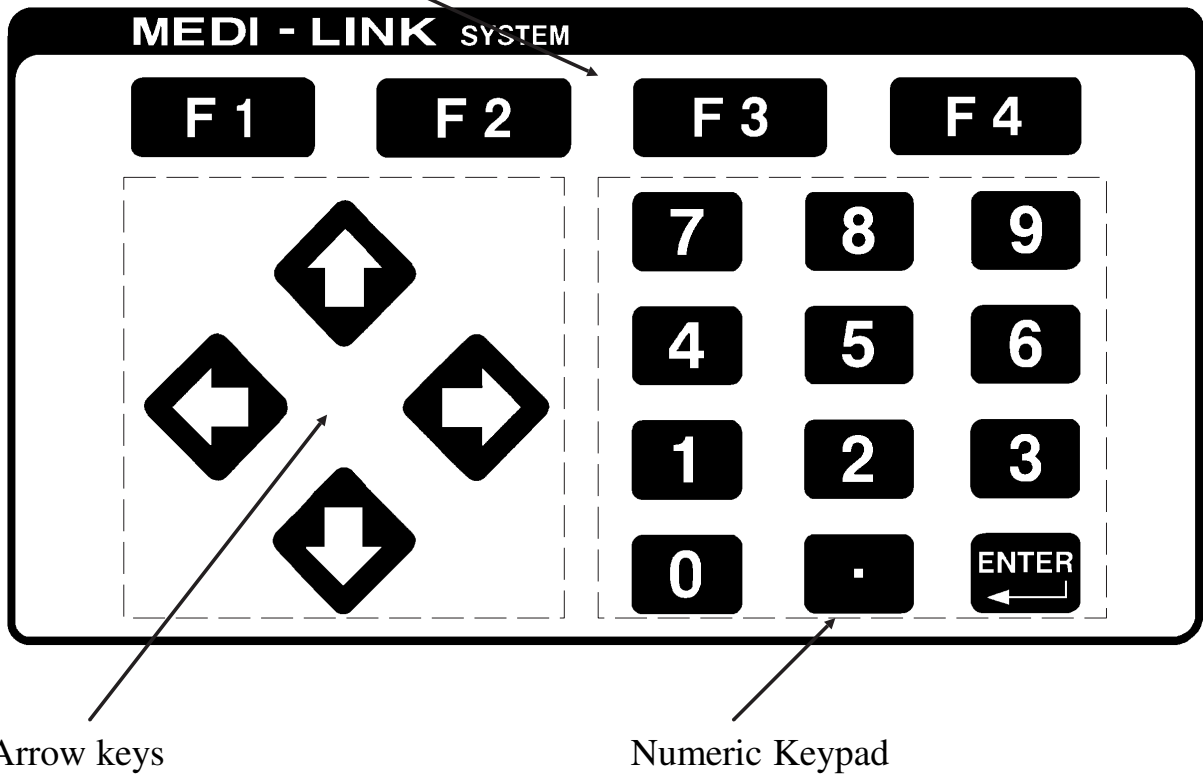


Figure 3 - Control Module Keyboard

When appropriate, four labels are displayed at the bottom of the Control Module display showing the action of the **Function Keys** (F1- F4). In figure 5 (page 14) F1 is HELP and F2 to F4 have no function.

Operating Instructions

Switching On

Connect the mains cable to the socket on the rear of the Control Module and then to a suitable mains outlet.

Release the display by pressing the screen release button on the Control Module (see figure 1).

Position the display at an angle to suit the operator. It is recommended that when the Medi-Link system is not in use the screen is left in its closed position to protect the display.

Switch on the Medi-Link system using the mains switch on the front panel. The green indicator adjacent to the switch will light.

The system will display the EMS logo, Company name and MEDI-LINK followed by the message "Checking system configuration" (see figure 4).

The Medi-Link will detect the presence of any new application module, give a short beep and display the messages "Configuration has changed" and "Loading application programs". The Medi-Link will then take between 15 and 45 seconds to re-configure itself and load the new application.

On successfully loading the application programs the display will show the System Menu screen (see figure 5).

Note that the next time the system is switched on there will be no need for the Medi-Link system to re-load the application programs. On switching on the display will show the EMS logo, Company name, MEDI-LINK and the "Checking system configuration" message for approximately 2 seconds followed by the System Menu.

The System Menu lists the detected modules and the System Set-Up option. The current date and time are displayed at the top right of the screen.

Use the up and down arrow keys to highlight the required option and press the ENTER key.

For details of application module programs see the separate section of this manual.

It is recommended that all programs are exited and the System Menu displayed before switching off the system using the mains switch.



**Electro-Medical Supplies
(Greenham) Ltd.**

MEDI-LINK

Checking system configuration

Figure 4 - Logos and Company name

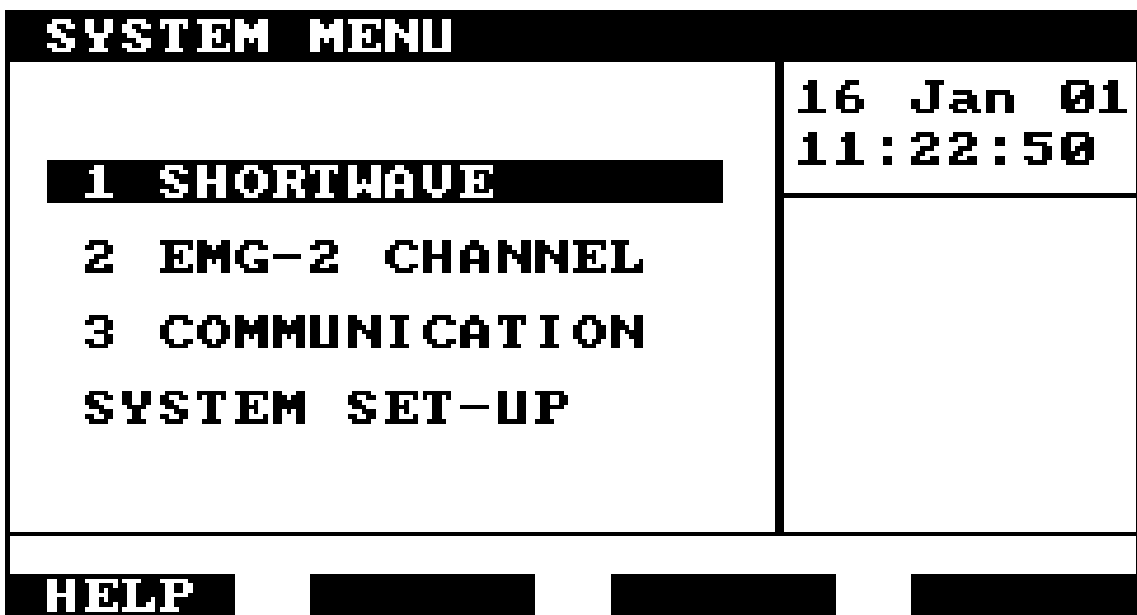


Figure 5 - System Menu

F1 - HELP

The label corresponding to the F1 function key at the bottom of the System Menu indicates that on-line HELP is available.

Press F1 - HELP to display help text relevant to the current display or activity (see figure 6).

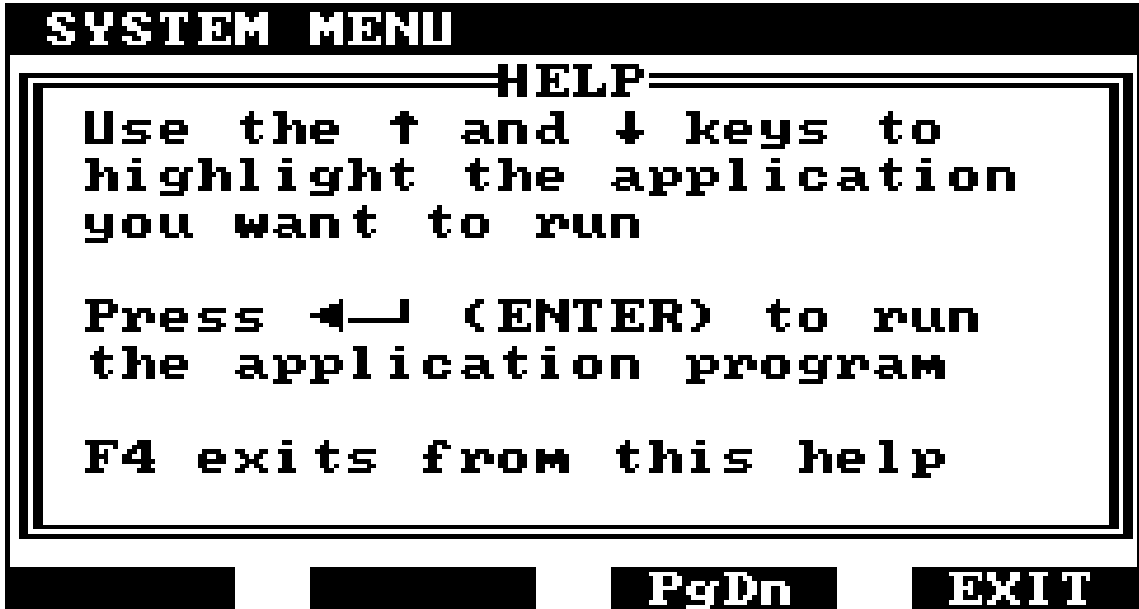


Figure 6 - Help Text Display

If the help text is more than can be displayed at one time, it may be scrolled up or down, one line at a time using the up and down arrow keys, or one screen at a time by pressing F2 - PgUp or F3 - PgDn. Note that the labels for F2 and F3 are only displayed when there is help text before the current display or after the current display respectively.

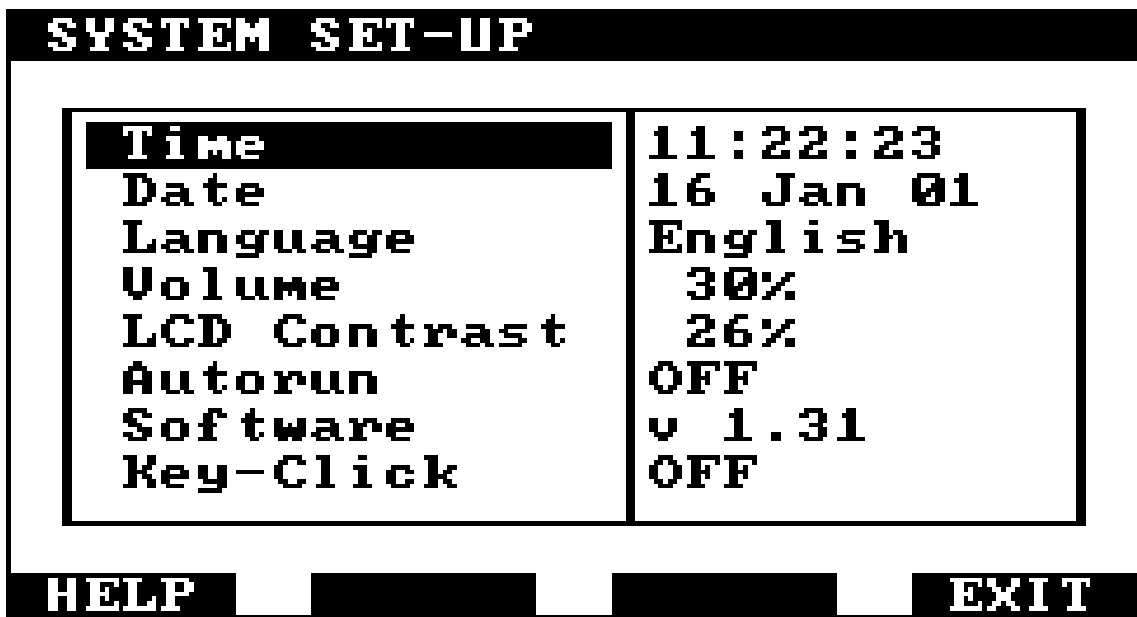
To exit from HELP, press F4 - EXIT.

Help text is available throughout the Medi-Link system whenever the label for F1 indicates HELP.

System Set-Up

The System Set-Up option allows the user to view and change settings which apply to the Medi-Link system as a whole, such as the volume of the internal buzzer and the contrast of the LCD.

To select the System Set-Up option from the System Menu, use the up and down arrow keys to highlight the System Set-Up label and then press the Enter key. The screen then displays a list of parameters with their current settings (figure 7).



SYSTEM SET-UP	
Time	11:22:23
Date	16 Jan 01
Language	English
Volume	30%
LCD Contrast	26%
Autorun	OFF
Software	v 1.31
Key-Click	OFF

HELP **EXIT**

Figure 7 - System Set-Up

To change one of the settings, use the up and down keys to highlight the required parameter and press Enter. The System Set-Up parameters are updated as they are changed and stored in battery-backed memory so that their settings are retained when the system is switched off. However, in order to check the integrity of the settings, a checksum is calculated and also saved on exit from the System Set-Up screen. Switching off the system while the unit is still in System Set-Up means that this checksum will not be updated and may lead to the report of an error on the next power up (see page 24).

To exit from System Set-Up and return to the System Menu press F4 - EXIT.

Time

The Medi-Link has a battery backed clock which reports the time and date on the System Menu display. The Time option is used to set the clock.

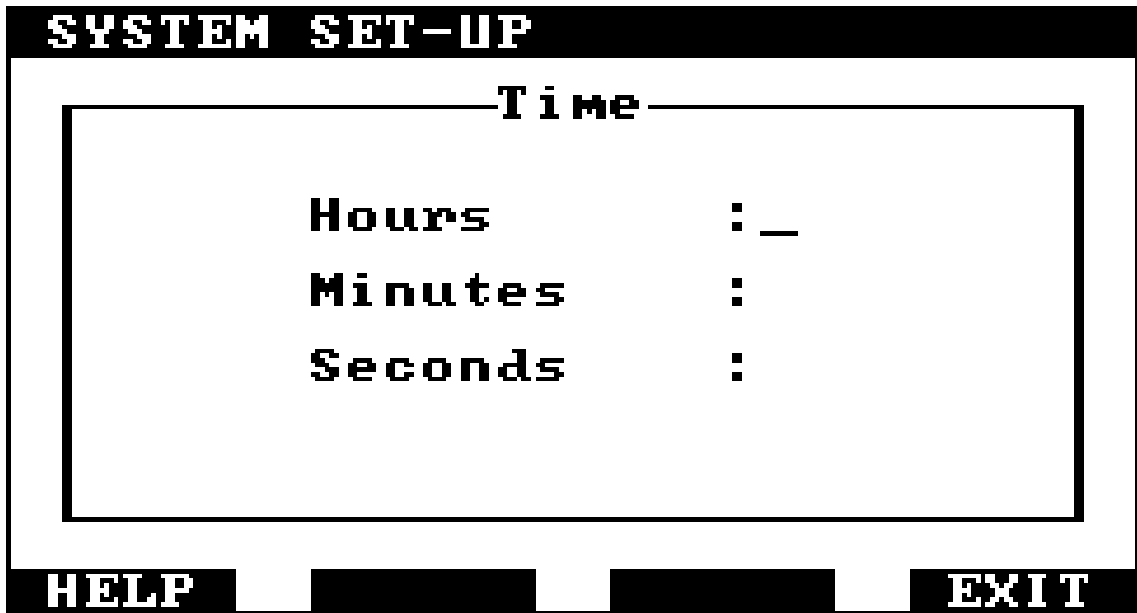


Figure 8 - Setting the Time

An underline cursor is displayed by the hours entry. Use the numeric keypad to type in the numbers required. The left arrow key serves as a delete key and the enter key confirms the number entered. In turn set the hours, minutes and seconds by typing in a one or two digit number and pressing Enter.

When entering the hours remember that the clock uses a 24-hour format.

When entering the seconds, type in a value a few seconds ahead and press enter when the time is correct.

Pressing Enter to confirm the seconds updates the clock and returns to the main System Set-Up screen (figure 7).

Pressing F4 - EXIT at any point will abort the procedure and return to the main System Set-Up screen without updating the time.

Date

To set the system date, highlight the Date label on the System Set-Up screen using the up and down arrow keys and press Enter.

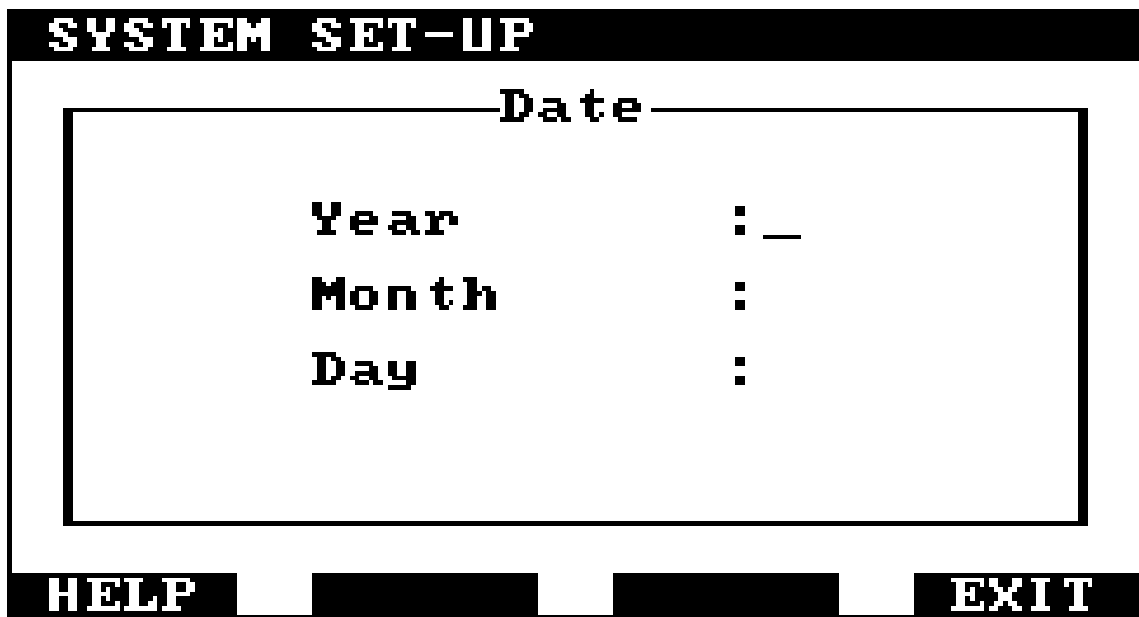


Figure 9 - Setting the Date

An underline cursor is displayed by the Year entry. Use the numeric keypad to type in the numbers required. The left arrow key serves as a delete key and the enter key confirms the number entered. In turn set the year, month and day by typing in a one or two digit number and pressing Enter.

When entering the year remember that the entry is only 2 digits as the century is not recorded.

Pressing Enter to confirm the day updates the calendar and returns to the main System Set-Up screen (figure 7).

Pressing F4 - EXIT at any point will abort the procedure and return to the main System Set-Up screen without changing the date.

Language

The text displayed on the Medi-Link screen may be shown in different languages. The current language may be changed using this option.



Figure 10 - Language selection

Use the up and down arrow keys to highlight the required language and press Enter. The display will return to the System Set-Up screen but all text will now be in the new language.

On exiting from the System Set-Up, having changed the language, the Medi-Link will restart as if it had been switch-on and check its configuration. It will report that the configuration has changed and proceed to load the application programs. This is because the application programs along with their text (including Help text) are loaded into the Control Module only in the current language and when this is changed the text in the new language must be loaded.

Pressing F4 - EXIT from the language selection screen will abort the procedure and return to the main System Set-Up screen without changing the language.

Volume

The volume level of the internal buzzer of the Medi-Link Control Module may be set from 0 to 100% in 2% steps.

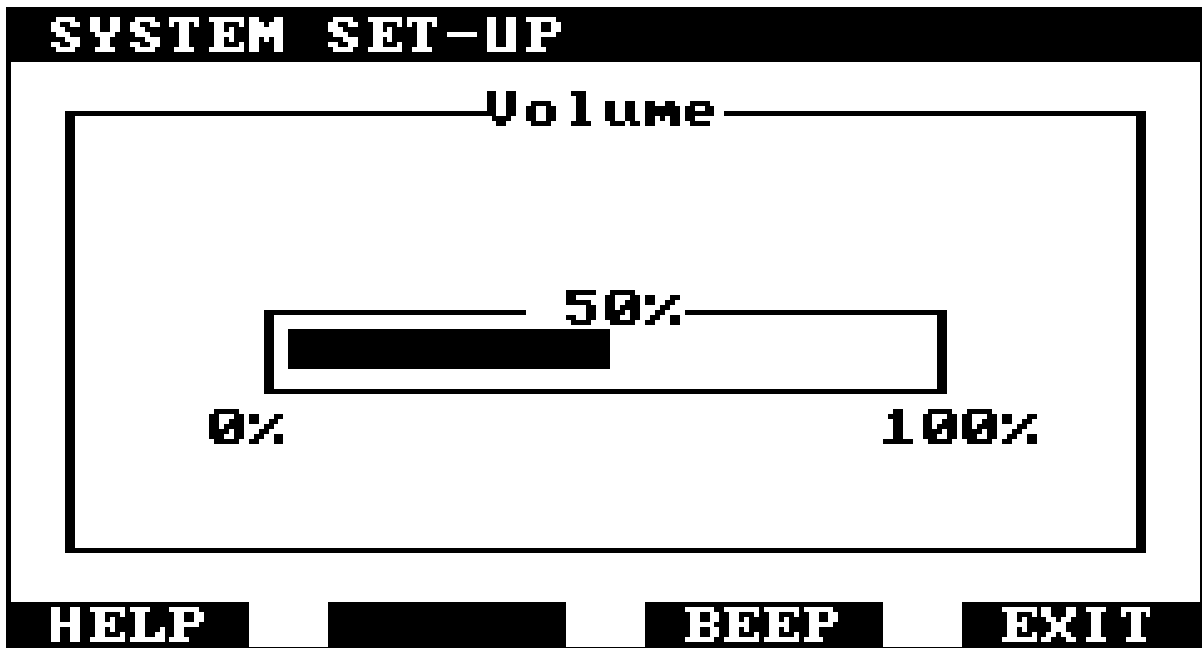


Figure 11 - Setting the Buzzer Volume

Use the right and left arrow keys to increase and decrease the volume. The bar graph and number above it show the current setting.

Pressing F3 will give a short beep at the current volume level to check that the setting is as required.

Having selected the desired volume level, press Enter to confirm the new setting and the display will return to the System Set-Up screen.

Pressing F4 - EXIT will return to the System Set-Up screen ignoring any change made to the volume level.

LCD Contrast

The LCD contrast may be changed to suit different preferences and different ambient lighting.

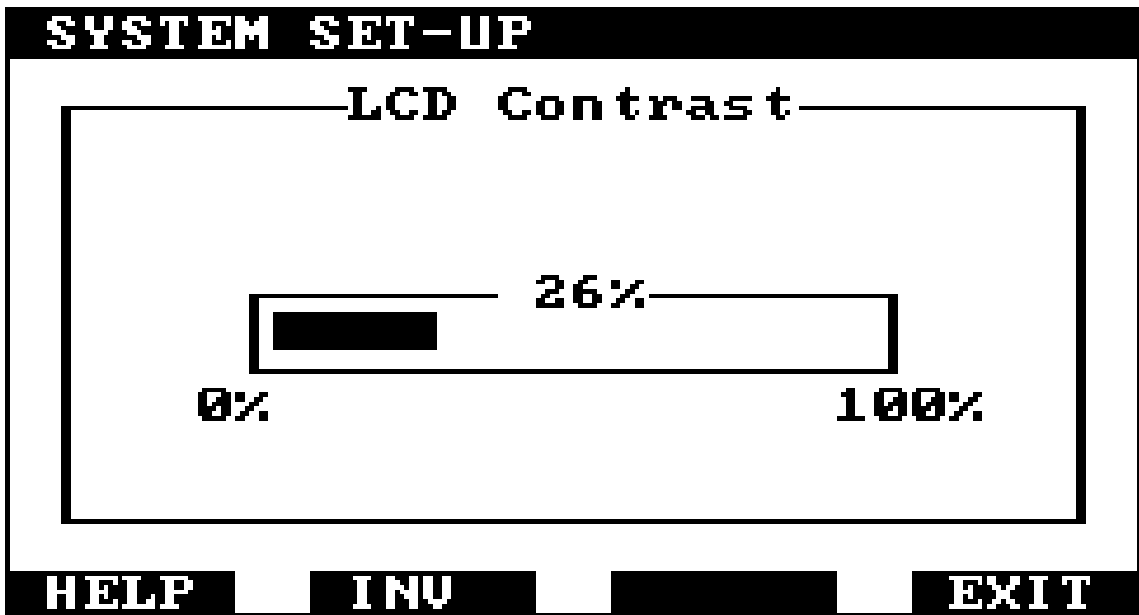


Figure 12 - Setting the LCD Contrast

Use the right and left arrow keys to lighten and darken the display. The bar graph and number above it show the current setting.

Pressing F2 - INV will invert the screen for users who prefer a negative display. This option was not available in software versions before 1.31.

Having selected the desired contrast, press Enter to confirm the new setting and the display will return to the System Set-Up screen.

Pressing F4 - EXIT will return to the System Set-Up screen ignoring any change made to the LCD contrast.

Autorun

The Autorun option allows the user to configure the Medi-Link system so that the System Menu is bypassed and a specified application program is run on power up. This is especially useful with single module systems where the single application may be run at power up removing the necessity to select the program from the System Menu. When an application has been selected by the autorun system the user can, of course, return to the System Menu by pressing F4 - EXIT from the application program main set-up screen.

The current status of the autorun system is shown on the System Set-Up screen (figure 7). To change the setting highlight the Autorun label and press Enter.

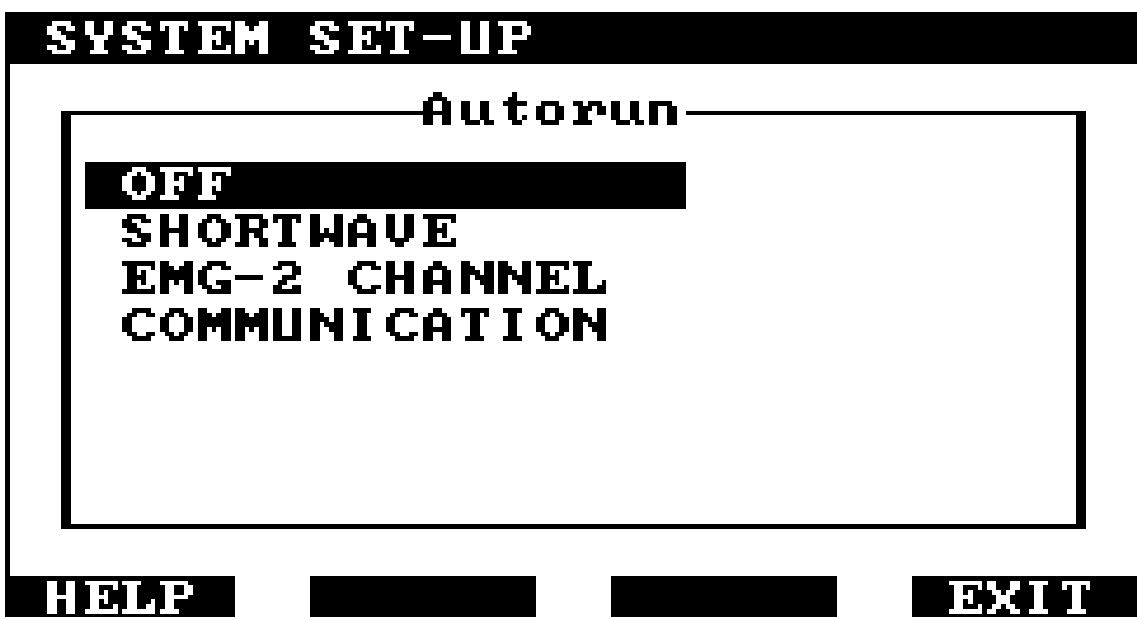


Figure 13 - Setting the Autorun option

The system will give a list of options starting with OFF and continuing with a list of the current application modules available to the control module. Highlight the required option and press Enter to confirm the selection and return to System Set-Up screen. The new selection will be displayed.

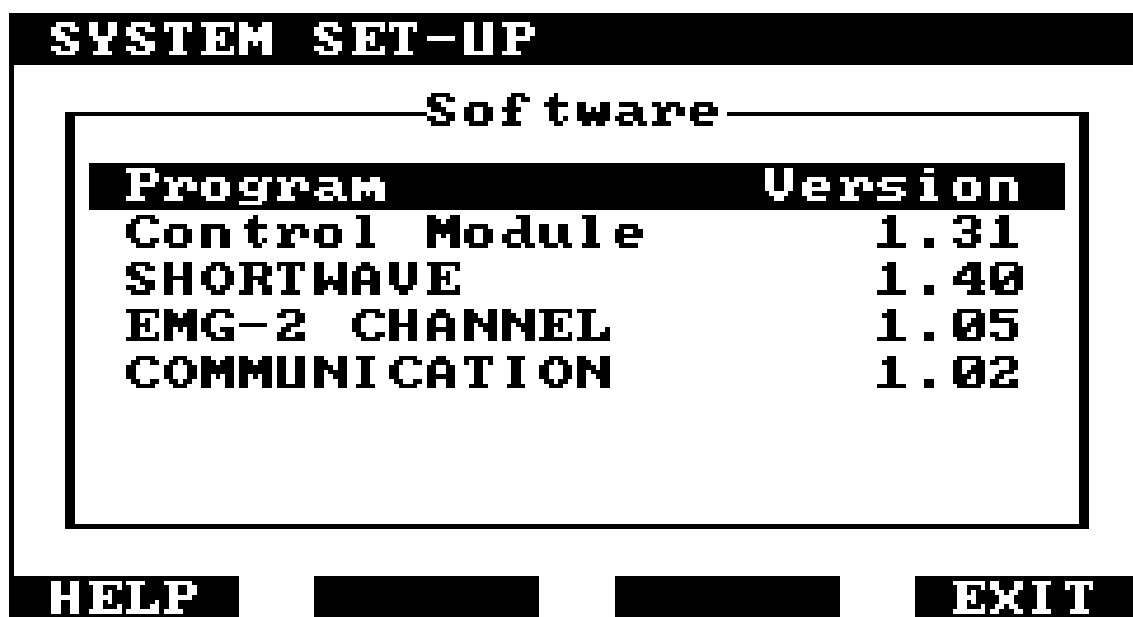
Pressing F4 - EXIT will return to the System Set-Up screen ignoring any change.

If a module is selected for Autorun and the module is then removed or changed the system will detect this and reset the option to OFF next time it is switched on.

Software

The version number of the control module software is displayed on the System Set-Up screen (figure 7). If the Software label is highlighted and Enter pressed the Medi-Link will check all modules present and report their software version on the screen as shown in figure 14.

It is important to quote the software version of the different modules when requesting any information on their operation.



The screenshot shows a terminal window titled "SYSTEM SET-UP". Inside, the "Software" menu option is selected. A table displays the software versions for four modules: Control Module (1.31), SHORTWAVE (1.40), EMG-2 CHANNEL (1.05), and COMMUNICATION (1.02). At the bottom, there are buttons for "HELP" and "EXIT".

Program	Version
Control Module	1.31
SHORTWAVE	1.40
EMG-2 CHANNEL	1.05
COMMUNICATION	1.02

Figure 14 - Software Version report

Press F4 - EXIT or Enter to return to the System Set-Up screen.

Key-click

When the key-click option is on there will be a short beep each time a key is pressed on the Medi-Link Control Module. If the key-click option is off there will be no beep. Highlight the key-click label on the System Set-Up screen and press Enter. The display will show the options available (figure 15).

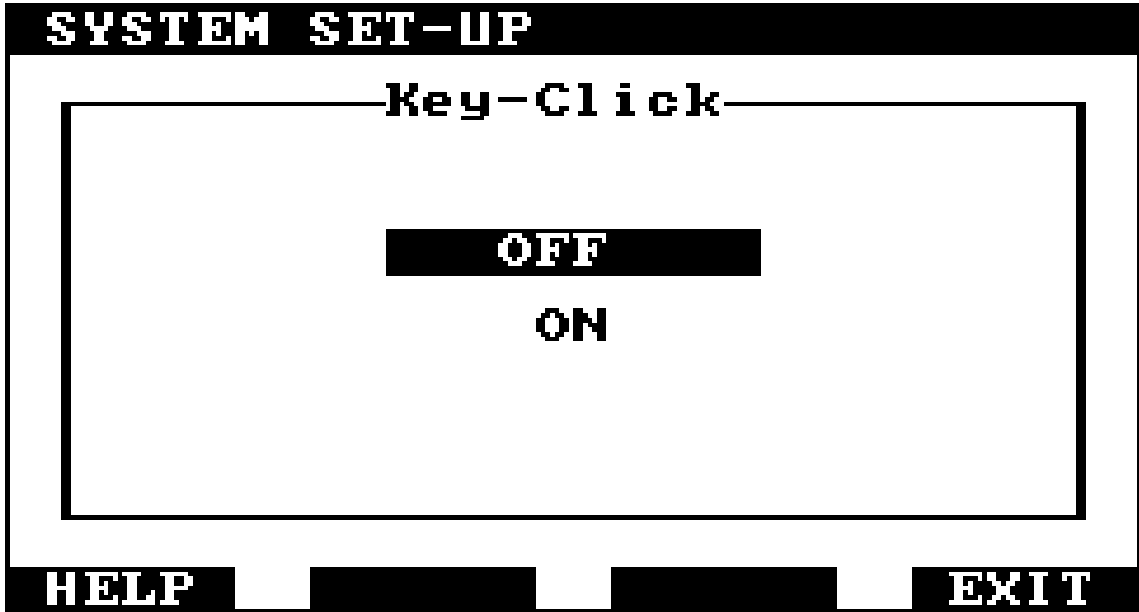


Figure 15 - Key-Click option

Use the up and down arrow keys to highlight the required option and press Enter to confirm the selection and return to the System Set-Up screen.

Pressing F4 - EXIT will return to the System Set-Up screen without making any change.

Maintenance

The unit may be cleaned by wiping over with a clean damp cloth. The use of abrasive materials should be avoided as they will cause damage to the casing. Cleaning solvents should also be avoided.

When the Medi-Link is switched on it performs a number of self-tests. If any error is found it is reported on the LCD screen. If the user has switched off the system at the System Set-Up screen a CMOS RAM checksum error may be reported. If this occurs then press any key to enter the System Set-Up screen. Check the data displayed is correct (Time, Date etc.) and then press F4 - EXIT. The system should then start normally.

The System Set-Up data is stored in battery-backed CMOS RAM. If real-time clock or CMOS checksum errors are regularly reported it is possible that the battery voltage is low. To recharge the battery leave the system on for approximately 8 hours. Low battery voltage can be a problem where the system is used infrequently. If the problem persists contact the EMS Service Department or its agent.

The mains fuses are mounted on the rear panel to the left of the mains inlet. The unit must be disconnected from the the mains before any attempt is made to replace these fuses. The fuse holders are of a bayonet type. A suitable screwdriver should be used to lightly press in the fuse holder cap and give it a quarter turn anti-clockwise to release it (reverse for the insertion of replacement fuses). Information on fuse type and rating is given on the rear panel of the unit and in the Technical Specification of this manual.

If the mains fuses continue to blow then EMS qualified Service personnel must be called in.

**THERE ARE NO USER-SERVICEABLE PARTS INSIDE THE UNIT
AND IT SHOULD NOT BE OPENED.**

Full servicing instructions are available on request.