EML224 Compact

CD401 LR Speed Log Repeater
Operation and Installation Manual

SKIPPER Electronics AS
Enebakkveien 150
P. O. Box 151, Manglerud
0612 Oslo, Norway
www.skipper.no

Telephone: +47 23 30 22 70
Telefax: +47 23 30 22 71
E-mail: support@skipper.no
Co. reg. no: NO-965378847-MVA

Document no: DM-R004-SB
Edition: 2012-04-26
Rev: 1.12

OPERATION AND INSTALLATION MANUAL

April 2012

Edition 2012-04-26 Sw. 1.12

SKIPPER Electronics AS

LR *Speed Log Repeater*

COMPACT VERSION

SKIPPER

Electronics AS

Communicating with us

If you need more information, support or other assistance from us, do not hesitate to contact us:

SKIPPER Electronics AS
Enebakkveien 150
P. O Box 151
NO-0612 Manglerud, Norway
Phone: + 47 23302270, Fax: + 47 23302271
E-mail Support@skipper.no

Software updates and technical support

Find us on the world wide web: **www.skipper.no**

Your Feedback is appreciated

If you find errors, misspellings or poorly explained sections in this document, please do not hesitate to contact us at:

support@skipper.no

OVERVIEW

Content of the manual

Terminology
Terms, units and abbreviations used in this manual.

Introduction
This part introduces you to the elements of the electromagnetic speed log (EML) system.

Chapter 1 – Physical installation
Correct installation of the system will ensure problem free service for many years. This section explains the main steps to get your system working.

Chapter 2 – Setting up the Compact Repeater
The Compact display is a flexible, yet intuitive display allowing data to be displayed in a user freindly way. It is also a primary system and can be integrated into the navigation system as regulation stipulate. This chapter explains how to set up the unit.

Chapter 3 – Routine operation
Once the system is installed and operational, the user can change the screen to show the data of interest at any particular time. This section explains the basic operation of the system.

Chapter 4 – checking your system
It is a good idea to verify your systems performance from time to time. This chapter describes how to check interfaces and other issues. In the event of mailfunction, this is a good place to start for trouble shooting.

Appendix 1 – Background information
Here you will find more details of how the system works and which factors are inportant to know when using it.

Appendix 2 – Formats
This section describes the inputs accepted byt the compact display in this configuration

Appendix 3 - Sending the system for repair
In the unfortunate case of a failure that requires a factory repair, the described return sequence should be followed.

Appendix 4 - Other options with the Speed log repeater

The Compact can be used in a number of different system both as a repeater and a speed log. This section explains what is available and how to activate the options. The compact also contains a diagnostics port, from which the user can obtain diagnostic information using hyperterm.

TABLE OF CONTENTS

TERMINOLOGY

Terms used in this manual

Units

Unless otherwise stated, all values shown on the display are as follows:

Distance	Nautical Miles (nm)
Speed	Nautical Miles per hour (Kn)
Speed	Pulses per Nautical Mile (P/nm)
Temperature	Degrees Celsius (°C)

Abbreviations

In addition, the following symbols are used on the Runtime screens

T_P	Daily Trip (in nm)
T_L	Total measured distance travelled
°	Degrees Centigrade
STW	Speed Through Water
TRIP	Text for Trip/Total
SOG	Speed Over Ground
TEMP	Text for TEMPerature

In Menu / Setup screens the following abbreviations are used:

STWWL	Speed Through Water – Water track – Longitudinal value
STWWT	Speed Through Water – Water track – Transversal value
SOGBL	Speed Over Ground – Bottom track – Longitudinal value
SOGBT	Speed Over Ground – Bottom track – Transversal value
SOGBA	Speed Over Ground – Bottom track – Aft value

INTRODUCTION

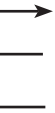
The LR speed Log Repeater

The SKIPPER Speed Log Repeater allow important speed values from log systems to be displayed anywhere on the vessel in the format the user wants. The Compact is unique in its simple, yet flexible way to display vital data in almost all conditions, from no light to bright sunlight. In addition, it is classed to IP56 allowing it to be mounted outside and used in any conditions. The unit is a standard 144 mm standard format allowing it to be mounted in tight spaces or overhead.

CHAPTER 1

PHYSICAL INSTALLATION

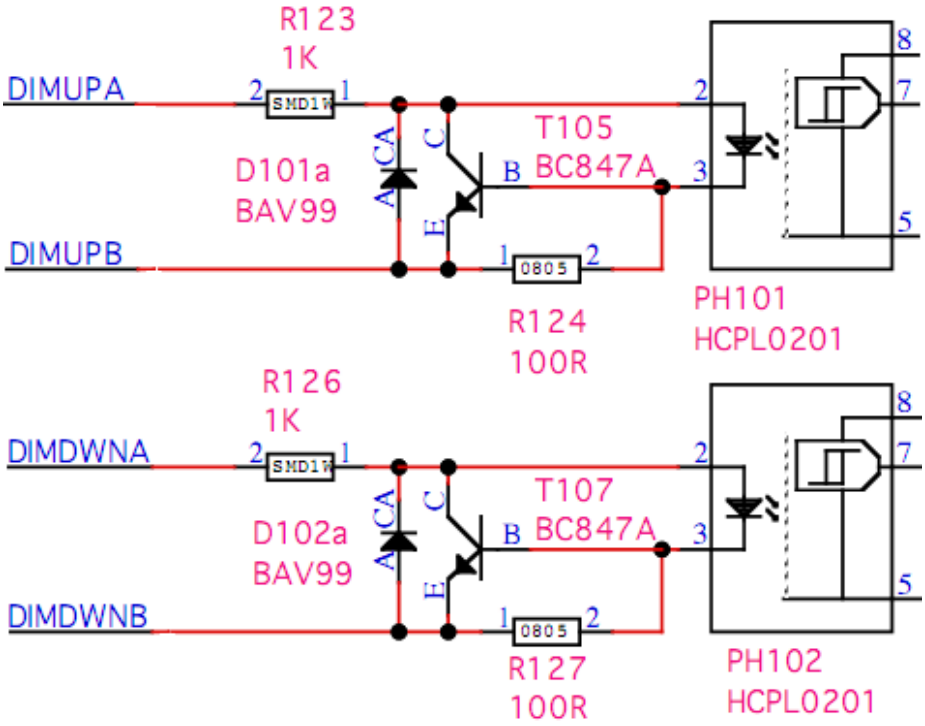
The Speed log repeater CD401LR is a stand alone unit and does not require additional circuitry. It should be supplied by a 24 V (18 V-36 V) 25 W DC supply and the cabling of the system is as per diagram below. The unit is supplied with 2 m of cable (12 core), this can be extended without problem. Only the wires in use need extending.



Color Codes	Pin no.	Signals
Grey	12	NMEA2 OUT B
Turquise	11	NMEA2 OUT A
Pink	10	NMEA1 OUT B
Orange	9	NMEA1 OUT A
Violet	8	DIM DWN B
Brown	7	DIM DWN A
Black	6	DIM UP B
White	5	DIM UP A
Yellow	4	NMEA IN B
Green	3	NMEA IN A
Blue	2	0V
Red	1	+24 V

THE DIMMING INPUTS

Pulses of at least 60ms on the dimming up and dimming down cables will cause the dimming to change by one level. The inputs are optocoupled and therefore require an external voltage to operate, (4 Volt -30 Volt (Typically 12/24 Volt)).



CHAPTER 2

Setting up the Compact Display

PRINCIPLES

The Compact Display is a flexible dot matrix LED display designed to display navigation data. The Speed log repeater can be user programmed to show most kinds of numerical data, from NMEA messages or self generated. It can also be used as a primary sensor display for speed logs showing the speed values produced by the sensor, or as a simple repeater. The Compact with its JB60CD box meets all the requirements of a primary device both functionally and electrically. On its own it meets the requirements as a repeater.

The Compact has three user definable alphanumeric displays, each allowing up to 4 parameters to be displayed. When the device is used as a primary device some of these screens will be fixed.

RUN SCREENS

The unit starts up in runtime mode. By pressing menu, the preset user screens can be selected. Some of the menu screens (i.e alarms) are also available in the runtime mode.

The unit can be dimmed in any of the runtime screens using the UP (↑) and DOWN (↓) buttons. If Trip/Total are selected as a displayed parameter, they can be toggled using the SET button.

MENU SCREENS

To change the setup of the Speead log repeater, the user must simultaneously press MENU and SET This will give access to a menu system allowing the user to scroll up and down the sub-menus and functions using UP (↑) and DOWN (↓), and SET to select. To move back up a menu, the MENU button must be pressed. The middle underlined line is the selected line. The other lines are dimmed.

The menu structure is shown in the diagram. The menus are product dependant, only the relevant menus are accessible. However, some menus are available in all setups.

ACTIVATING THE RUNTIME DISPLAYS

The system has three user preset screens, Screen 1 may be locked in some configurations. In addition the user can make the most common setup screens available. The Screens menu allows the user to choose which runtime screens to include. Using the SET button the user can enable, disable each individual screen. UP (↑) and DOWN (↓) will scroll to the available screens.

CONFIGURING OF DATA SCREENS

The 3 user programmable screens can be set up using the Config (CONFG) menu. This submenu allows the user to select one of the three displays, and on entering the config screen, the user can change the data type to be displayed in each of the 4 screen positions. Up and down will change the data type, SET will move to the next screen position. If text (TXT) is selected on one of the lines, the display will show 4 lines of data in 5 point font, otherwise 3 lines of 7 point font will be used.

Placing TXT in the bottom 4th line or 3rd and 4th line will cause the data to spread out showing fewer data points. The system will not allow you to mix speed data from different sources on the same screen. Having 2 TXT lines after each other will also rearrange the positioning.

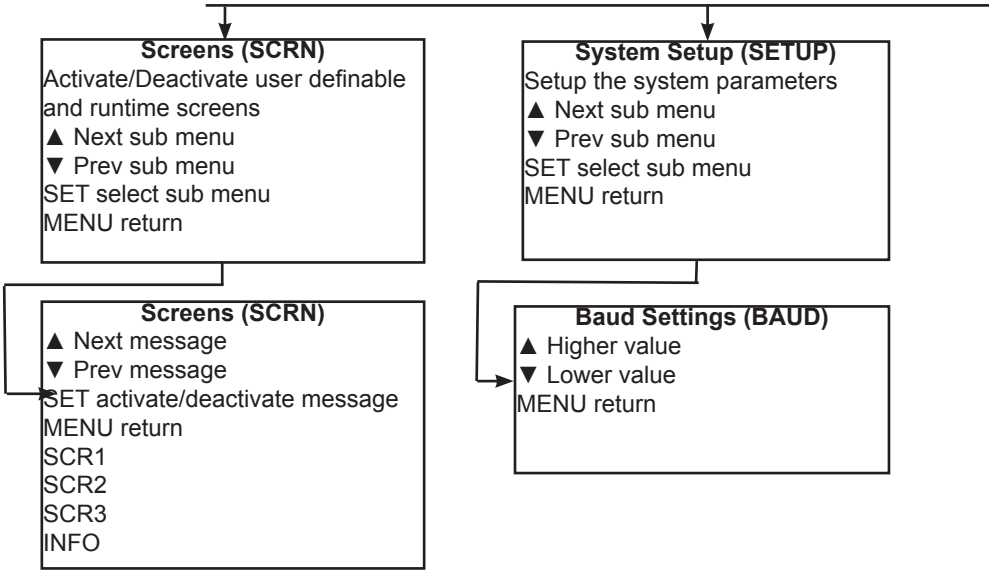
Note: The Speed log repeater have one screen which indicates just the primary data. This screen is fixed and cannot be adjusted.

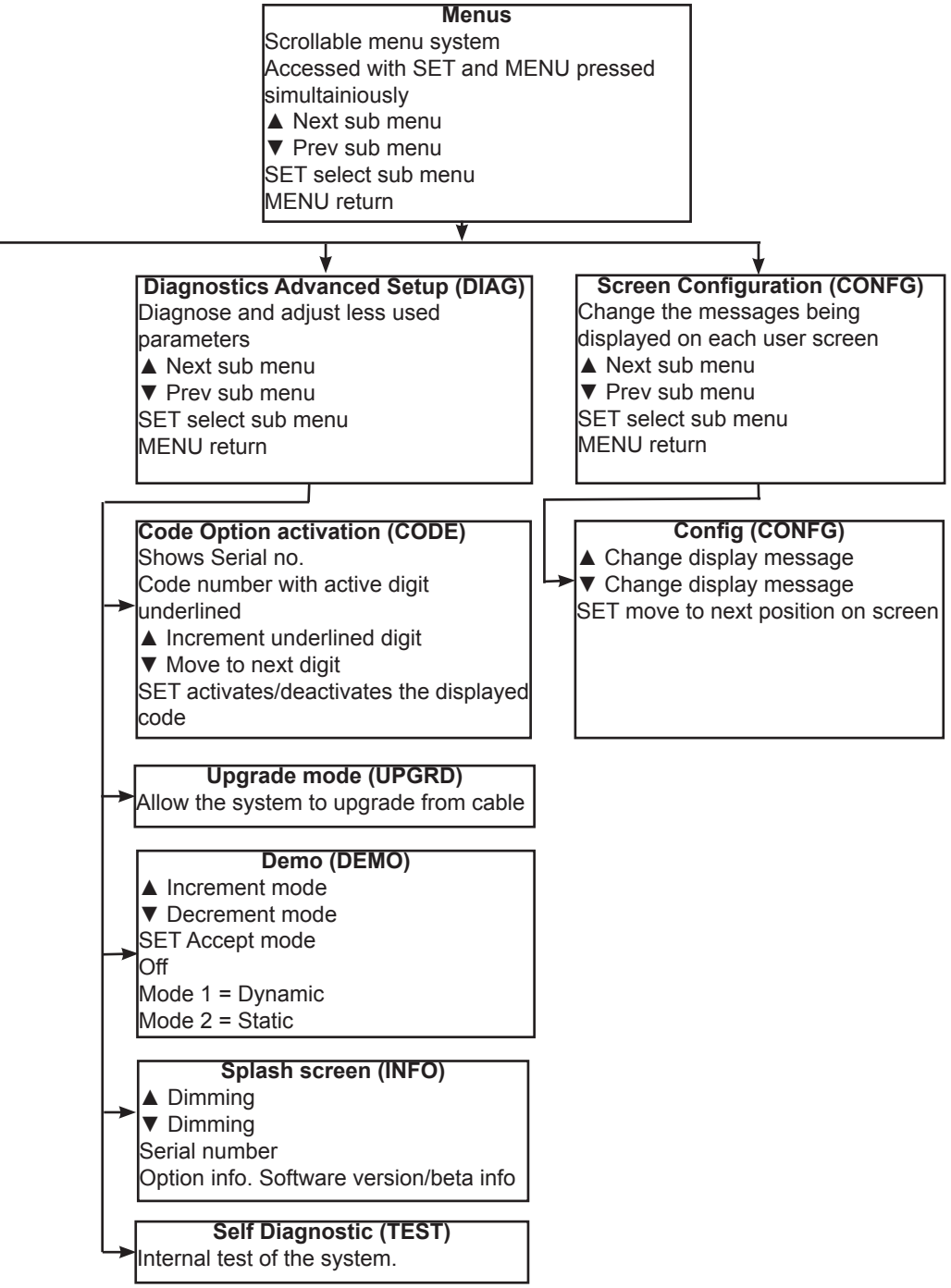
The non-active parameters will continue showing the dimmed present data, when not selected.

Example:

TXT	STW	TXT	STW	TXT	STW
STWL =	10,1 &	STW L =	10,1 &	STW L =	10,1
TXT		STW T	0,2	STW T	0,2
TXT		TXT		Trip	T_L 90683

Menu Diagram




Menus
Scrollable menu system
Accessed with SET and MENU pressed simultainiously
▲ Next sub menu
▼ Prev sub menu
SET select sub menu
MENU return
Diagnostics Advanced Setup (DIAG)
Diagnose and adjust less used parameters
▲ Next sub menu
▼ Prev sub menu
SET select sub menu
MENU return
Screen Configuration (CONFG)
Change the messages being displayed on each user screen
▲ Next sub menu
▼ Prev sub menu
SET select sub menu
MENU return
Code Option activation (CODE)
Shows Serial no.
Code number with active digit underlined
▲ Increment underlined digit
▼ Move to next digit
SET activates/deactivates the displayed code
Config (CONFG)
▲ Change display message
▼ Change display message
SET move to next position on screen
Upgrade mode (UPGRD)
Allow the system to upgrade from cable
Demo (DEMO)
▲ Increment mode
▼ Decrement mode
SET Accept mode
Off
Mode 1 = Dynamic
Mode 2 = Static
Splash screen (INFO)
▲ Dimming
▼ Dimming
Serial number
Option info. Software version/beta info
Self Diagnostic (TEST)
Internal test of the system.

ACCEPTED INPUTS

The system will allow many NMEA formats to be displayed. Version 1.02 of the software allows the following:

Speed long, trans, fore/aft water/bottom	VMVBW
Temperature (water)	VMMTW,
Trip/Total	VMVLW,

The system will automatically update recognized formats.

CHANGING OF THE BAUD RATE

The NMEA (IEC61162-1) standard is 4800 baud. Some vessels run with higher baud rates. 4800, 9600, 19200, 38400, 57600 and 115200 baud rates can be selected in the baud screen of the setup menu. It is recommended that the sensor is kept to 4800 as this speed is robust over longer cables. The baud rates become active as you leave the baud page.

DEMO MODE

A demo mode is available, and can be activated in the diagnostics menu. Two modes are available.

- **Mode 1** is a **dynamic** demo mode taking the present value as the start point and slowly varying all the available values.
- **Mode 2** is a **static** mode taking the present values and keeping them active.

When the demo mode is active, alarms will be disabled, and the screen will indicate the demo state with a solid red line at the top and bottom of the screen. The user can turn off the demo mode from the demo screen, or by recycling the power. The demo mode will turn off automatically after 10 hours.

CHAPTER 3
ROUTINE OPERATION

RUNTIME SCREENS

The unit starts up in runtime mode. By pressing menu, the preset runtime screens can be selected. Some of the menu screens (i.e alarms) are also available in the runtime mode.The unit can be dimmed in any of the runtime screens using the UP (↑) and DOWN (↓) buttons. If Trip/Total are selected as a displayed parameter, they can be toggled using the SET button.

CHAPTER 4

MAINTENANCE

ROUTINE MAINTENANCE

No maintenance is required. The screen can be cleaned with standard window cleaning solutions.

CHECKING YOUR VERSION

If the info screen is activated on the run screens, the System type and firmware version can be read from there. Otherwise the same screen can be obtained in the diagnostics menu. The System type will be one of the following:

CDE1	Compact display EML 1 axis
CDE2	Compact display EML 2 axis
CDLR	Compact display Log Repeater
CDMR	Compact display Multi Repeater

The system will be locked to one of these setups, but can be changed to one of the other systems (with an additional cost) using a code (see appendix 4).

FIRMWARE UPGRADE

The system is undergoing continuously improvements, and periodically new firmware will be released. A chip can be supplied (with an additional cost) with the new software. This is changed by removing the backplate of the Speed log repeater unit.

APPENDIX 1

Specification and mechanical drawings

To help planning and installation, the following diagrams are supplied.

1. System full specification
2. Compact CP401 mounting diagram

In addition further guides for mounting of your particular hull mounting can be found at www.skipper.no .

SYSTEM FULL SPECIFICATION

Name	CD401LR-xx Speed log repeater
Accepted parameters:	
Speed through water	(VBW) Longitudinal, Transversal and Transversal Aft
Speed over ground	(VBW) Longitudinal, Transversal and Transversal Aft
Water temperature	(MTW)
Trip and daily total	(VLW)

DISPLAY

Weight (display)	1.3 kg
Cable length display to patch	2 m, (max) 100 m
Compass safe distance (min)	30 cm
User adjustable screens	3
Parameters per display	2 with text, 3 with single text line

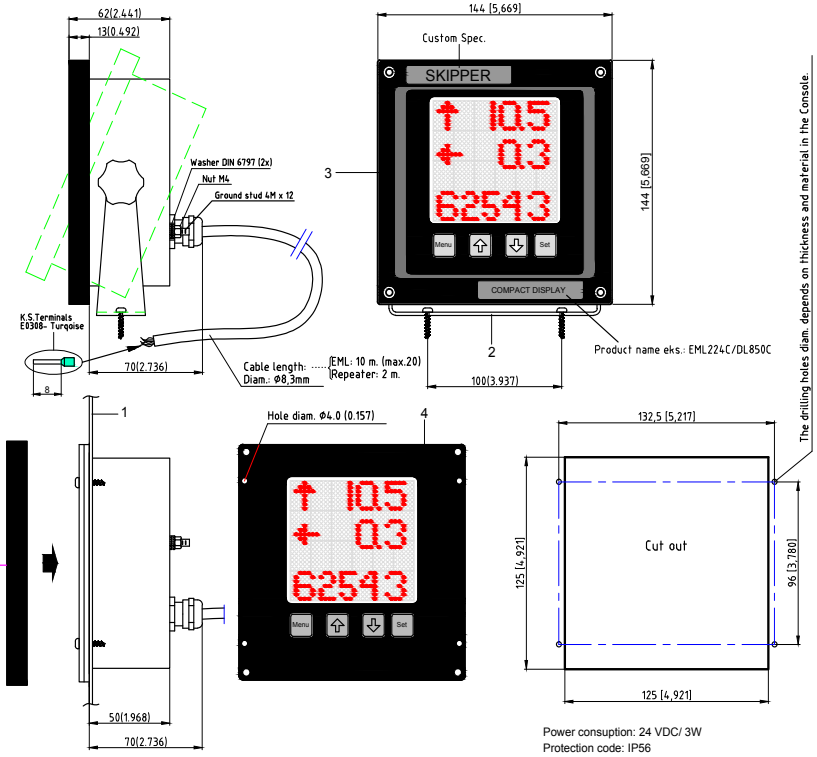
USER DEFINES INPUTS/OUTPUTS

Outputs	2 x NMEA (IEC61162-1) (buffered input)
Inputs	1 NMEA (OPTO isolated)
	External imming (pulse)

ACCEPTED NMEA (IEC61162-1) FORMATS

Inputs	
Speed	VBW
Distance	VLW
Others	MTW (temp)
Power Supply	DC: 24 V/25 Watt
Display	28 x 30 pixel alphanumeric LED (red).with dimming.
Languages	English.
Accessories	Dimming control
Classification	IMO MED B
Service	Available in most major harbours, world-wide through extensive dealer network. See www.skipper.no for further information.

RevNo	Revision note	Date	Signature	Checked



Console mounting order:

A. Make a cut out in the Console (1) 125 x 125 (4.921 x 4.921)

B. Remove the mountingbracket (2)

C. Unscrew the 4 screws in the frame (3) (one in each corner) and remove the frame.

D. Put the Monitor (4) in the cut out and mark the 4 centerpoints for the Drill in the Console (1) (The drilling holes diam. depends on thickness and material in the Console.)

E. Use Panh. screws DIN 7981 Diam. 2.9 (0.114). Length depends on the Console thickness.

F. Finally put on the frame (3). Make sure that the screwheads correspond with the cut outs in the frame.

Itemref	Quantity	Title/Name, designation, material, dimension etc		Article No./Reference	
Designed by A.Matre	Checked by	Approved by - date	File name	Date 2008.06.12	Scale
SKIPPER Electronics AS		Compact Display			
		TB-3016	Revision 01	Draw. Edition 100324	Sheet 01

APPENDIX 2

ACCEPTED FORMATS

ACCEPTED NMEA 0183 (IEC61162-1) MESSAGES

VBW	Multiple Speed Commands	$VMVBW,x.x,y.y,A,x.x,y.y,V,z.z,V,z.z,V *hh<CR><LF>	Where x.x is Longitudinal speed in knots, y.y is transversal speed in knots, y.y aft transversal speeds are also accepted
VLW	Distance Travelled through the Water	$VMVLW,x.x,N,y.y,N *hh<CR><LF>	x.x is Daily Trip, y.y is total trip in NM
MTW	Temperature	$VMMTW,x.x,C, *hh<CR><LF>	x.x is temperature in Celsius

All data fields are free format. Values will be preceeded with sign as needed. (e.g “-“ = Astern, Port) *hh = Checksum

Some proprietry sentences beginning with $PSKP can be accepted to allow configuration and system diagnostics. Contact skipper@skipper.no for more details

APPENDIX 3

Sending the system for repair

In the unlikely chance that a system fails, it may be necessary to send a part of the system back for repair. Make contact with your local dealer for warranty case (list available on www.skipper.no.)

On contact with SKIPPER, the case will be given a SKIPPERid number. This should be quoted on all correspondace, and marked clearly on all parts returned.

For normal service/support please contact SKIPPER Electronics AS on mail support@skipper.no or our local dealer (list available on www.skipper.no.)

APPENDIX 4

OTHER OPTIONS WITH THE COMPACT DISPLAY

COMPACT OPTIONS

The Compact display unit can be used in the following modes:

Speed repeater	CD401LR
Multi repeater	CD401MR
Single axis EML	CD401E1 with JB60CD connection box
Dual axis EML	CD401E2 with JB60CD connection box

In these modes the following options are available

Speed repeater:	A simple repeater for speed in 1 or 2 axis and trip. Limited functionality
Multi repeater:	A comprehensive reopeater for many of the normal NMEA messages, also functions for user defined messages.
EML 224 Single axis speed repeater.	As above but with just longitudinal value.
EML 224 Dual axis speed repeater.	As above

The software for all these systems is stored in the system and the system configuration can be changed using a security code. This code can be obtained from www.skipper.no. By sending an order to SKIPPER together with the systems serial number. (Obtained by opening the code screen in diagnostics). On entering the supplied code number, the system options will be set. Please note that the cabling is different for repeaters and speed logs and so these are not compatible without replacing the back plate.

CHANGING THE SYSTEM/ ADDING OPTIONS

The Compact display unit is being developed as a low cost display alternative to full graphics displays already available. Most extra features are available for the Compact and these can be activated using the CODE page in the setup menu. On this menu, the systems unique ID is displayed, and the new options can be purchased from the SKIPPER retailer to add extra functions. You will receive a code to be entered in the codes screen.

NOTE: It is important to note that pay option codes are unique for each individual unit and will not work on other units.


SKIPPER
SER N
082102
CODE
519C8
Menu
Set
EML 224


SKIPPER
CODE
UPGRD
DEMO
Menu
Set
EML 224