

Choosing a location

Each compass is calibrated in the factory so the more careful you choose the location for the Compass sensor the better the result will be.

It is very important that the sensor is mounted away from any material that is likely to cause magnetic interference.

- Inside mounting.
- A safe distance from external magnetic interference: 3m/10ft from VHF, RDF, loudspeakers, depth sounders, engines, or power cables carrying heavy current.
- 3m/10ft from Radar and SSB equipment.
- Well protected from physical damage.
- Optimum positioning: As low as possible to minimise effect of pitching and rolling of boat.
- Do not mount the compass near magnets (card compass).

Should there be any doubt about the suitability of mounting the sensor due to magnetic interference, a hand compass may be used to determine any magnetic deviation at the proposed mounting place.

LCS specifications:

Resolution	: 0.1°
Repeatability	: 1°
Tilt compensated	: up to 35°
Output error	: 3° max.
Output change with tilt	: 3° max.
Interface	: NMEA 0183
Baudrate	: 4800
Parity	: N
Stopbits	: 1
Power supply	: 50mA @ 12V, 30mA @ 24V
Operating temp. Range	: -10 to +55 °C
Dimensions	: 33 X 17 X 89/110mm
Cable length	: 10m
Reverse battery protection	

Mounting (inside only)

The back side of the compass has two mounting holes to install the compass.

Use only non-magnetic fasteners to secure the compass.

The arrow on top of the LCS should point upwards and the printed side should point to the bow of the vessel.



Calibration of the LCS:

Magnetic deviation, caused by the vessel itself, results in incorrect compass readings. This magnetic deviation can be corrected by means of the calibration procedure.

Automatic calibration

The LCS compass has an automatic calibration procedure. Default "Auto Calibration" is "ON". The compass will calibrate itself everytime two full circles have been made within 1 to max. 4 minutes per circle.

If you have an ECI1 or ECI2 display you can switch this function OFF and use the manual calibration command.

Manual calibration for ECI1/2 owners

If you own an ECI1 or ECI2 display then you can do the following to start calibration:

To calibrate the ECS1/3 compass you need a calm day and a clear area. Start turning your boat in a large circle at a slow speed. Then select calibrate in the menu and press up and down buttons together for two seconds. Now the display shows the heading and 'In process'. The time to complete the circle (full 360°) should be at least 1 up to max. 4 minutes. When the calibration was successful the display shows "Done" and a short beep will be heard. Circles may be clockwise or counterclockwise.

If the circle was not in between the time limits, the old calibration is restored and you can see on the display if the circle was too fast or too slow.

NMEA0183 commands

Special calibration commands:

```

$IIELP,CAL,ECS,STRT*CC<13><10> // Start cal
$IIELP,CAL,ECS,STOP*CC<13><10> // Stop cal
$IIELP,CAL,ECS,AUTO*CC<13><10> // Auto cal on
$IIELP,CAL,ECS,MANU*CC<13><10> // Auto cal off
$IIELP,CAL,ECS,VARI,X.X*CC<13><10> // Variation(+/-45.0)
$IIELP,CAL,ECS,ALIG,X.X*CC<13><10> // Align (+/-99.9)
$IIELP,CAL,ECS,SFWR*CC<13><10> // Firmware version
    
```

NMEA0183 messages

Response message:

```

$IIELP,CAL,ECS,DONE*CC<13><10> // message "Done"
$IIELP,CAL,ECS,FAST*CC<13><10> // message "Fast"
$IIELP,CAL,ECS,SLOW*CC<13><10> // message "Slow"
$IIELP,CAL,ECS,STRT*CC<13><10> // message "Start"
$IIELP,CAL,ECS,STOP*CC<13><10> // message "Stop"
$IIELP,CAL,ECS,SFWR,X,Y,Z*CC<13><10> // Ver.
    
```

NMEA0183 messages

The LCS uses standard NMEA0183 messages but also some special calibration commands and messages. The messages are updated two times per second.

The serial interface is 4800 baud, no parity, 1 stopbit.

Heading: \$HCHDG,X.X,Y.Y,v,Z.Z,Q*CC<13><10>

X.X = compass heading.
 Y.Y,v = not used
 Z.Z = variation
 Q = variation "E"ast or "W"est
 CC = Checksum field
 <13> = carriage return
 <10> = line feed

Checksum = The checksum is the 8-bit exclusive OR (no start or stop bits) of all characters in the message, including ",", delimiters, between but not including the "\$" and the "*" delimiters.

Wire assignments

Wire number	Color	description
1	Blank shield	Shield GND
2	White	Not used
3	Yellow	Not used
4	Black	GND
5	Red	+12/24V Power input
6	Brown	NMEA0183-IN-
7	Purple	NMEA0183-IN+
8	Blue	NMEA0183-out (in combination with GND)

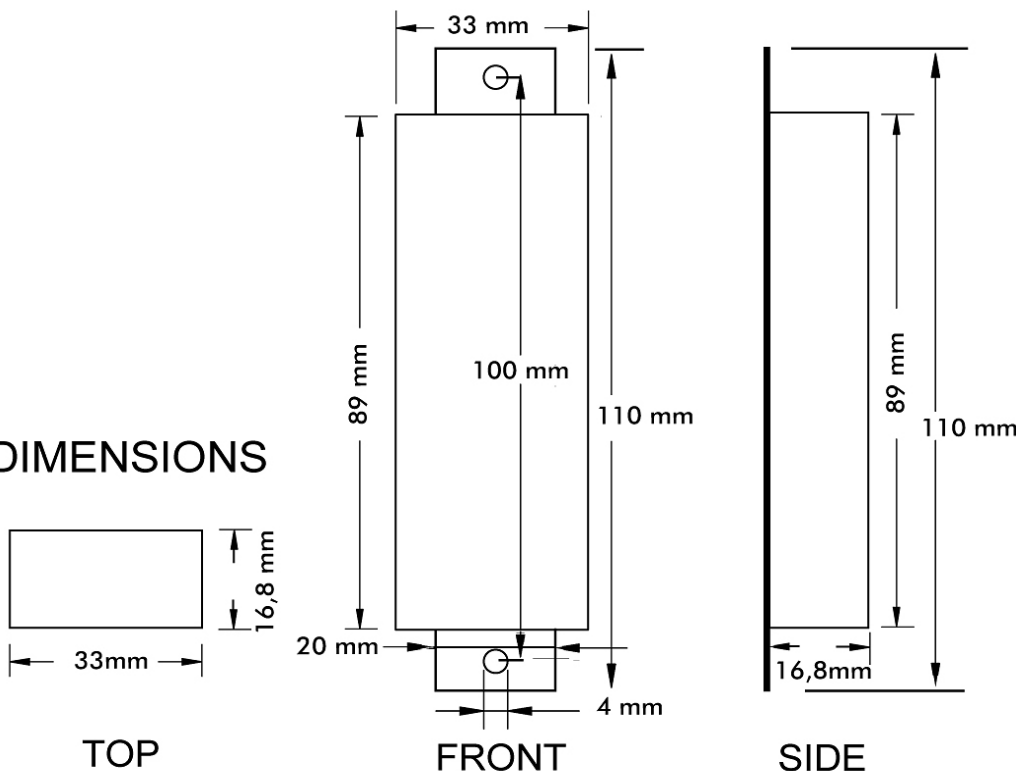
Certifications

Maritime Navigational and Radio communication Equipment & Systems according to IEC 60945

EMC : Conducted/Radiated Emmission : according to IEC 60945-9
 Conducted/Radiated Immunity : according to IEC 60945-10
 Safety :Dangerous voltage, etc. : according to IEC 60945-12



DIMENSIONS



For more information and a detailed manual, see:

www.elproma.com/compass

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Specifications are subject to change without notice