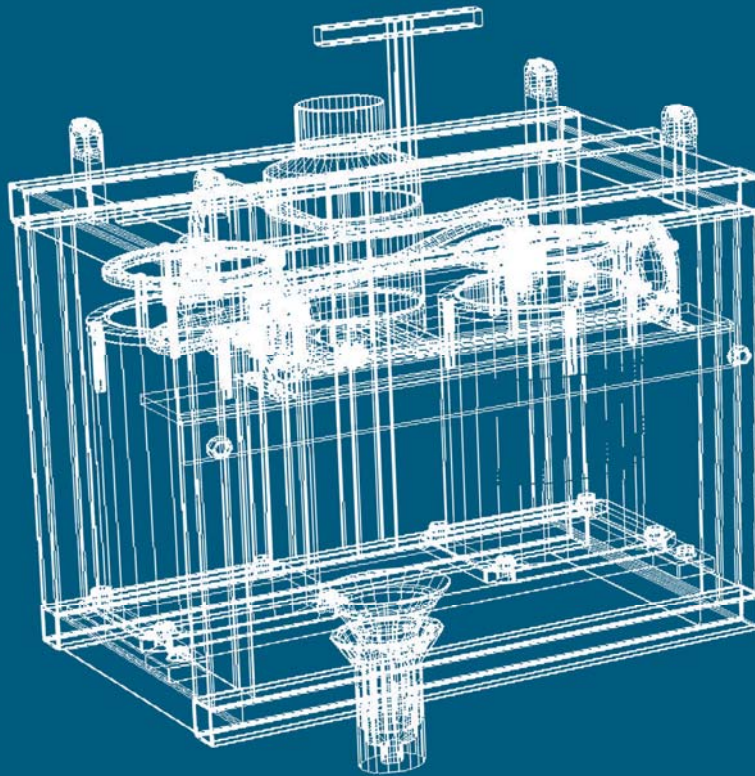




RemoteGyro

Technical Manual



CDL
Silverfield House
Claymore Drive
Aberdeen
AB23 8GD

Tel: +44 (0) 1224 706655
Fax: +44 (0) 1224 709840
Web: www.cd ltd.net
Email: info@cd ltd.net

Document Rev D

Contents






- 1. INTRODUCTION**
 - 1.1 General description
 - 1.2 Warranty
- 2. THE UNITS**
 - 2.1 The MiniRLG
 - 2.2 The DATUM
 - 2.3 The MiniTXT Subsea Display Unit
- 3. INSTALLATION**
 - 3.1 Unpacking and inspection
 - 3.2 Setup Procedure
- 4. OPERATION**
 - 4.1 Latitude & hemisphere setup
 - 4.2 Charging the batteries
- 5. PC SOFTWARE (Optional)**
 - 5.1 Introduction
 - 5.2 The MiniRLG Remote Gyro Software
 - 5.3 Setting up the comms ports
 - 5.4 The Attitude Displays
 - 5.5 Data Logging
 - 5.6 On/Off
- 6. CONTACTING CDL**
 - 6.1 By phone
 - 6.2 By email
 - 6.3 Out of hours

1. INTRODUCTION

1.1 General description

The CDL Remote Gyro system is a fully standalone gyrocompass system which can recover attitude signals from a remote location without the use of cabling to the surface.

The system comprises ...

-  CDL MiniRLG
-  CDL DATUM acoustic modem system and MiniTXT subsea display unit
-  Rechargeable battery pack
-  Protection frame
-  Subsea cables

1.2 Warranty

CDLtd UK warrants 'Remote Gyro' products to be free from defects in materials or workmanship for one year beginning on the date when the equipment was shipped from the CDL base or from their authorised distributor.

Units must be packaged with care when returning to the CDLtd base. CDLtd recommends that the original packing material is retained for this purpose.

The responsibility of CDLtd in respect of this warranty is limited solely to product replacement or repair at an authorised location only. Determination of replacement or repair will be made by CDLtd personnel or by personnel expressly authorised by CDLtd for this purpose.

This warranty will not extend to damage or failure resulting from misuse, neglect, accident, alteration, improper installation, non-approved cables or accessories, or operation in an environment other than intended.

In no event will CDLtd be liable for any indirect, incidental or consequential damages whether through tort, contract or otherwise. This warranty is expressly in lieu of all other warranties, expressed or implied, including without limitation the implied warranties of merchantability or fitness for a particular purpose. The foregoing states the entire liability of CDLtd with respect to the products described herein.

2. THE UNITS

2.1 The MiniRLG

The CDL MiniRLG is a solid state gyrocompass system based around the Kearfott T16-B monolithic ring laser gyro and a triad of MOD V1A accelerometers.

The monolithic triaxial design of the ring laser gives a significant size advantage over a triad of traditional uniaxial ring lasers with the same level of performance. This, combined with CDL's compact electronics, allows an overall package size of just 30cm x 18cm diameter.



The unit can be powered from an external 24Vdc. The subsea pod has data available in RS422 and RS232 formats for easy integration to ROV multiplexer systems.

At the topside, the MiniRLG is monitored and controlled by the custom PC Software package (optional).

2.2 The DATUM

DATUM is an acronym for Digital Acoustic Transponder & Underwater Modem. The CDL DATUM system uses state of the art spread spectrum and digital signal processing technology to offer a long range high speed device for use in ranging and data applications in deep water.

Purpose designed algorithms provide high reliability data communications with a bit error rate of $10 \text{ e-}6$ or better with very high immunity to noise, Doppler fading and multi-path effects.



Each unit is uniquely addressable and the system is networkable. Data can be sent or received from any DATUM network.

2.3 The Underwater Display Unit

This high quality underwater display unit can operate at depths of up to 3000 meters. And will be constantly updated with the Heading, Pitch and Roll readings from the MiniRLG. Please refer to the supplied MiniTXT manual for further information and instructions.



3. INSTALLATION

3.1 Unpacking and inspection

The system was shipped from CDL in a specially designed transit case(s) that contains cavities for each system component. This transit case should ensure that the equipment reaches its destination in perfect working order.

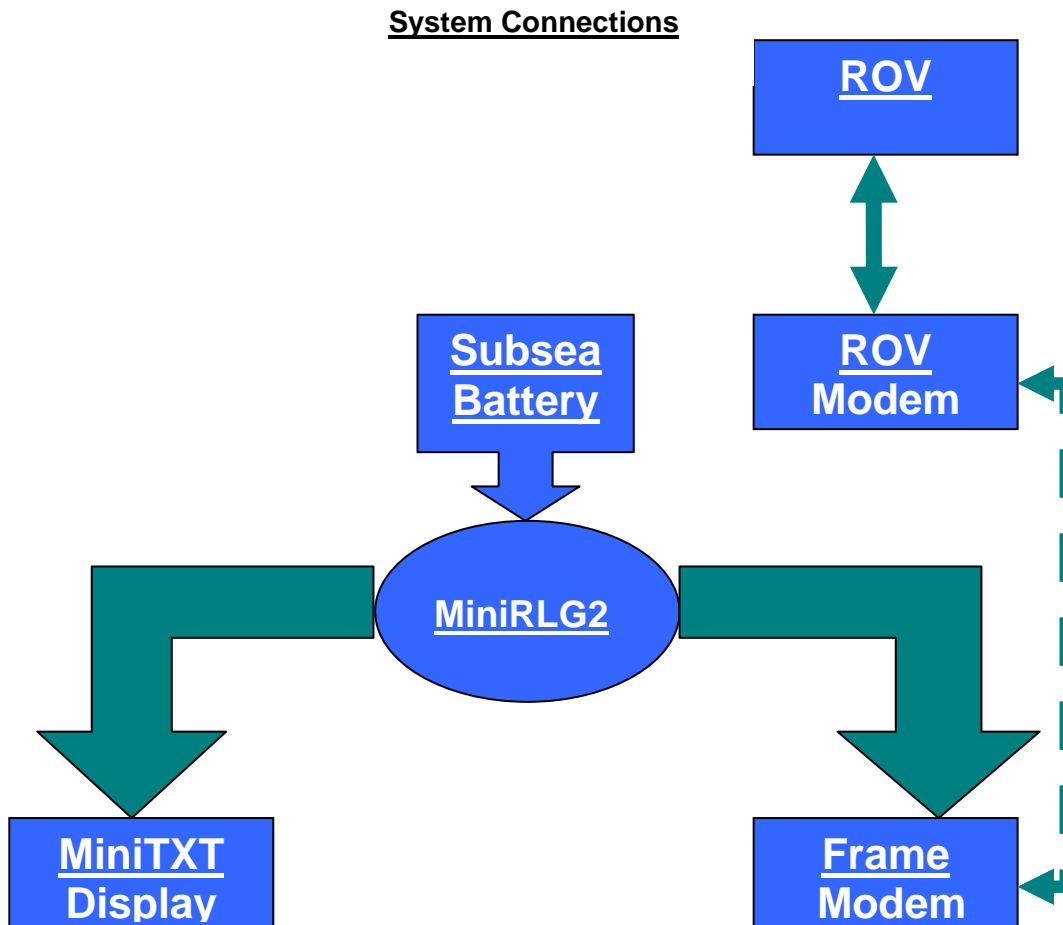
It is recommended that the original packing case be used for each subsequent transportation of the equipment.

On receipt of the equipment, the contents of the packing case should be carefully unpacked and checked against the items on the shipping documents for any errors or omissions.

3.2 Setup Procedure

Connect the supplied cables to the units.

Figure 3.1 below shows the electrical and data connective paths. The Battery feeds power, via the cable to the MiniRLG then from there on to the MiniTXT Display and Modem. The ROV sends data to, and receives commands from, a DATUM Modem which communicates with the "Frame" DATUM modem.



The remote Gyro comes supplied with custom made cables which handles both power and data connections. One of the cables connects the subsea battery pack to the MiniRLG, which then internally splits the power to cables which supply the MiniTXT Display and “Frame” Modem. A second cable connects the MiniRLG to the MiniTXT display providing the power and data and a third cable connects the MiniRLG to a “Frame” modem with power and data. The cable to the battery is a 2013 Burton connector while the connectors to the MiniRLG, MiniTXT display unit and “Frame” Modem have 2013 and 1608, 1608 and 1608 Burtons respectively. The cables and connectors are robust and will provide reliable connectivity during normal use.

Figure 3.2 below shows how the Remote Gyro Cables are wired.

Remote Gyro Wiring Diagrams

Cable No. 35

MiniRLG2 to MiniTXT

Total Length 1/2m Underwater Cable

MiniRLG2
Burton 55A1-1508

MiniTXT
Burton 55A1-1508
90 degree mould

1	-----+24V -----	1
2	-----GND -----	2
3	-----→ (Tx) RS232 data → -----	5
5	----- (Rx) RS232 data -----	3
6	-----RS232 Data GND -----	6

Cable No. 36

MiniRLG2 to Subsea Battery Pack

Total Length 1/2m Underwater Cable

MiniRLG2
Burton 55A1-2013
Female

Battery Pack
Burton 66A1-2013
Male

4	-----GND -----	13
9	-----+24v -----	12

4. OPERATION

4.1 Latitude & hemisphere setup

Ensure that the Gyro latitude and hemisphere are set correctly for the specific locality. The supplier of the MiniRLG may have already set this for you. If this is not the case please refer to the supplied MiniRLG manual for instruction on how to do this.

4.2 Charging the battery pack

1. Using the supplied charger cable connect the battery pod to the battery charger as follows.
2. Plug in the 12way Binder connector into the battery charger then plug the 2013 Burton male connector into the 2013 Burton female connector on the battery pack.
3. Switch on the battery charger – the 9 indicator LED's should all be lit up at this stage, if the pack requires recharging and the battery status LED flashing.
4. The indicator LED's will go out individually when the individual battery packs are fully charged. When all the LED's have gone out the battery status LED will be solidly on, the battery pack will then be fully charged and is ready for use.

IMPORTANT

The battery pack will get warm while charging so always charge the battery pack in an open space, away from direct sunlight.

There are internal thermal switches built into the battery pack, which will function if overheating occurs during charging.

5. PC SOFTWARE (Optional)

5.1 Introduction

The MiniRLG is at the forefront of underwater survey and navigational technology. In a tiny unit the MiniRLG houses an Attitude Sensor, three Ring Lasers and three Linear Accelerometers. These work together to produce accurate data for Heading, Pitch and Roll. Data from the MiniRLG is sent to a subsea display and to a DATUM acoustic modem which can transmit the data signal to a computer for monitoring and logging purposes.

5.2 The MiniRLG Remote Gyro Software

This software displays and logs the data sent from the MiniRLG and can transmit commands to the MiniRLG to shut it down or start it up. This is particularly useful for conserving battery life.

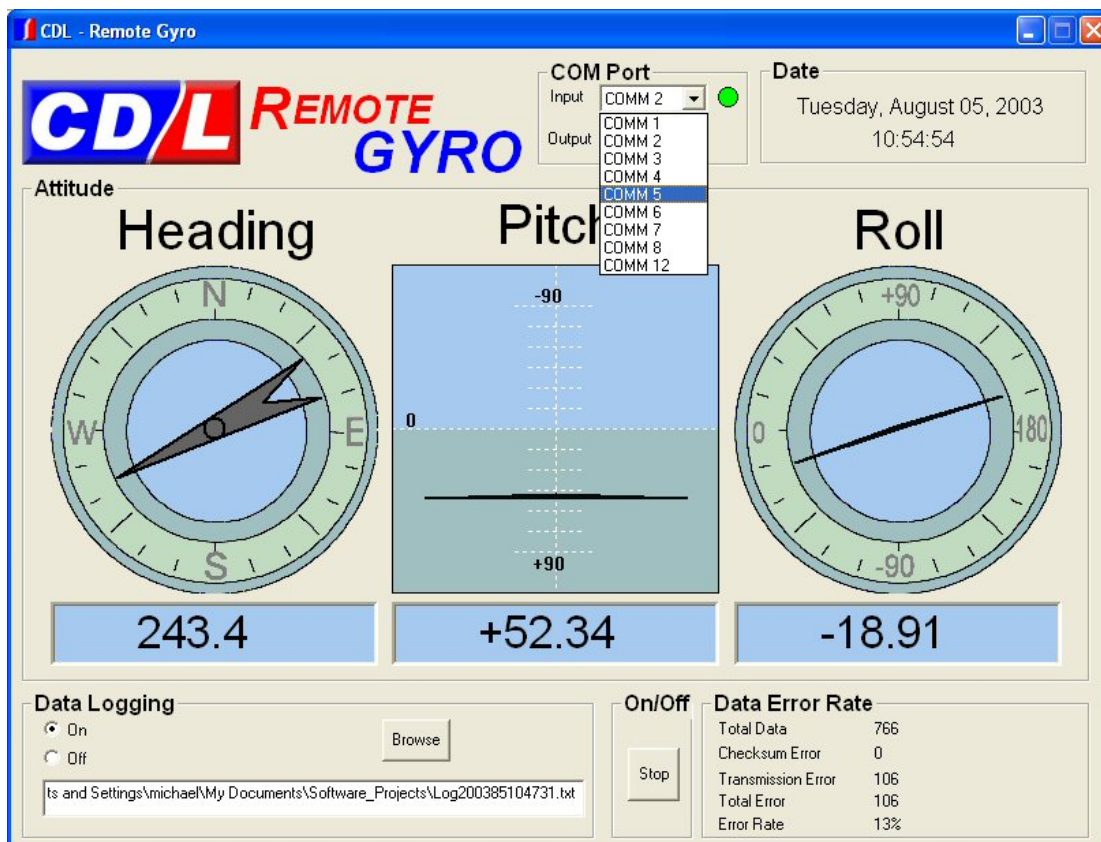


Figure 5.1

5.2.1 Setting up the comms ports

The software will automatically detect the available comm ports on your system (up to port 16). The comm ports will be listed in the drop-down listbox labelled "COM Port" near the top of the display. Select the comm port your receiving modem is connected to.

5.2.2 The Attitude Displays

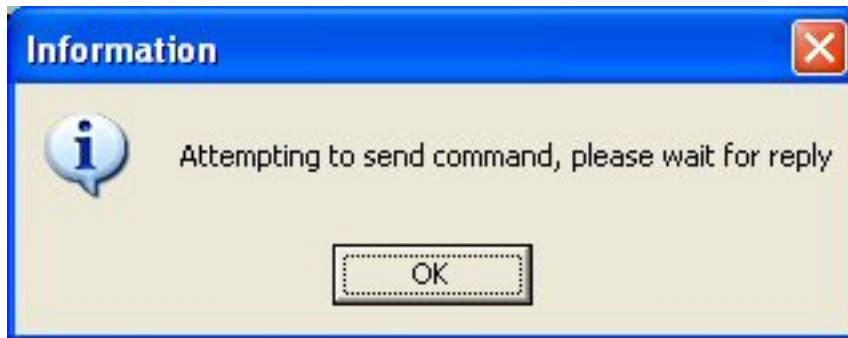
When data start flowing the three attitude displays will change to reflect Heading Pitch and Roll values and any changes in the values received will be immediately updated on the display.

5.2.3 Data Logging

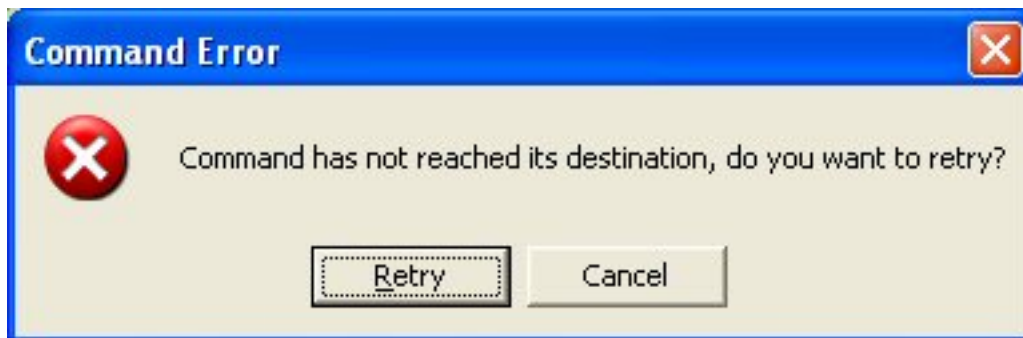
Data logging can be switched on or off with the “radio” buttons. If you do not input a file name and path in the edit window the software will automatically name and save the log file to the same folder (directory) the software is installed to. The automatically saved file will be named according to the current date and time.

5.2.4 On/Off

This button is used to start or stop the MiniRLG to conserve battery life. The button will change between “Start” and “Stop” according to the state of the MiniRLG. When a command has been sent the software will wait two minutes



If the command has not been echoed back within those two minutes the software will assume the command has not been received and will prompt the user to resend the command.



Click retry to send the “Stop” or “Start” message again.

6. CONTACTING CDL

6.1 BY PHONE

Tel: +44 (0) 1224 706655

Fax: +44 (0) 1224 709840

Web: www.cd ltd.net

6.2 BY EMAIL

Colin Crichton

cc@cd ltd.net

Gary Crichton

gc@cd ltd.net

Mads Fogh

mf@cd ltd.net

Nick Murray

nm@cd ltd.net

Murray Leys

ml@cd ltd.net

Craig Spy

cs@cd ltd.net

6.3 OUT OF HOURS

Out of hours contact numbers

Colin Crichton (CEO)	(mobile)	-	+44 (0) 7803 034261
Gary Crichton (Technical Director)	(mobile)	-	+44 (0) 7803 909128
Nick J. Murray (Production Director)	(mobile)	-	+44 (0) 7711 505805
Mads Fogh (Development Supervisor)	(mobile)	-	+44 (0) 7595 357197
Craig Spy (Development Engineer)	(mobile)	-	+44 (0) 7890 643243
Murray Leys (Production Manager)	(mobile)	-	+44 (0) 7801 431986

In case of faults or queries please contact the Development Engineers in the first instance.