FUGRO-LCT

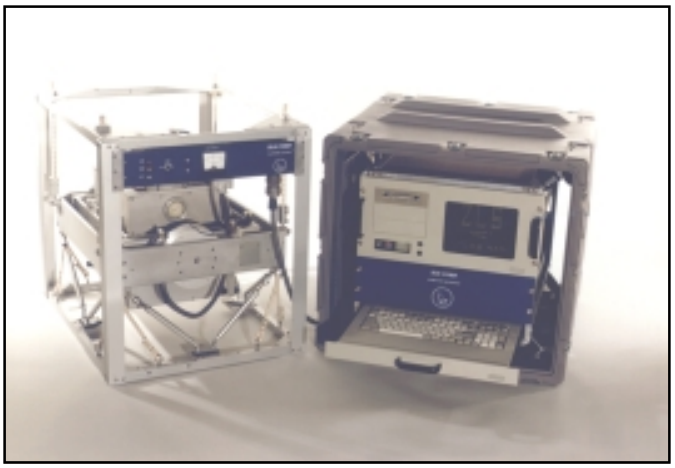
ZLS Control System

for Air/Sea Gravity Meters

The ZLS Control System is built around the proven QNX real-time multi-tasking operating system. The computer contains two expansion boards holding an analog-to-digital converter and a digital-to-analog converter. These boards control the stepping motor and provide digital I/O capability.

The computer digitizes and processes raw data from the accelerometers, gyros, and gravity sensor at the rate of 200Hz. The platform servo control loops update at 200 Hz. Cross-coupling monitors calculate at 25 Hz. It then filters data and computes final observed gravity (in counter units).

The system stores data on the hard disk. However, you can also simultaneously direct the data to display on the video monitor, or output using the serial port and printer in a variety of formats. Additionally, the ZLS system will accommodate up to six analog channels and 24 digital channels, allowing for appending of external data.



The above photo shows the complete ZLS Control System with the gravity platform and measuring element on the left and the electronics control package on the right.

Features:

- Advanced control system uses a true real-time multi-tasking environment
- Digital techniques replace analog hardware, eliminating electronic drift and enhancing system reliability
- Fully automatic system starts and functions unattended after a power interruption
- Full manual control during menu selections
- Simultaneous data output to video monitor, hard disk, serial port, and printer
- Printer output can be in graphic or digital format
- Self-contained transit case

Sampling:

- Two hundred Hertz data sample rate accurately digitizes sensor, gyro, and accelerometer signals, assuring no loss of signal information
- Twenty-five Hertz computation of cross-coupling monitors assures accuracy

Diagnostics:

- Alarm function that shuts down system and provides remote alarm signal in the event of a serious system malfunction
- Keyboard log that records all keyboard activity for review

Reliability:

- Complete testing and final adjustment at the ZLS test facility for vertical, horizontal, circular, and ramp testing
- Self-contained precision gyro power supply and servo amplifiers

ZLS Technical Specifications

Estimated Survey Resolution

Resolution of recorded data	0.1 mGal
Good operating conditions	Better than 0.2 mGal at 0.5 km wavelengths
Average operating conditions	Better than 0.5 mGal at 2 km wavelengths

ZLS System filtering:

Digital filter prior to 1-second sampling	200-point running average of 200 Hz samples

Stable platform:

Fully digital	Set to standard 4-minute period

Physical installation:

The gravity sensor and platform should be located at the center of pitch and roll of the vessel. The gravity element and electronics console may be installed with a standard separation distance of up to 30 ft.

Ancillary input:

Digital Input	24 Bit TTL Compatible Input
16 analog channels	2 bit digitization, ± 10 V max

Data recording:

Digital	Hourly files of 1-second data
Analog	Unison Analog Printout

Digital Recording Media:

Iomega zip disk (primary)
3.5 inch floppy diskette

Digital Output:

ZLS formatted data available
via RS-232 serial interface

Power requirements:

Standard State:	3 Amps @ 50-60 Hz, 117 VAC

Clock and gyro power source:

Frequency available:	200 Hz
Temperature stability:	5ppm -20C<T<+70C
Short term aging:	1×10^{-9}/sec
Adjustability:	Sufficient for five years of aging

Shipping Configuration:

The complete ZLS System nominally consists of 10 pieces at a gross weight of app 450 Kgs.

Specifications subject to change without notice.

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