

# LC-2 Series Dataloggers

## Applications

The LC-2 series dataloggers are used to read all Geokon vibrating wire instruments. Sensors that can be read and monitored include...

- Piezometers
- Precision water level sensors
- Crackmeters
- Settlement systems
- Temperature sensors



• Model 8002-1A-1 (LC-2A) Single-Channel Datalogger (10-pin transducer connector option and RS-232 data connection).



• Model 8002-1-1 (LC-2) Single-Channel Datalogger (internal hard wired transducer connection and RS-232 data connection).

## Operating Principle

The Model 8002 LC-2 Series Dataloggers are designed to read both the vibrating wire element and the integral thermistor of any Geokon vibrating wire sensor.

The LC-2 (internal hard wired transducer connection) and LC-2A (10-pin transducer connector option) are designed to be standalone, single-channel dataloggers, which makes them especially useful for the remote and continuous monitoring of isolated sensors.

The LC-2×4 is a self-contained, 4-channel version (vibrating wire with thermistor) of the LC-2, and the LC-2×16 is a 16-channel (vibrating wire with thermistor) version.

All LC-2 Series Dataloggers are housed inside Fiberglass NEMA 4X enclosures, which makes them very robust, weather-proof and particularly well-suited to operation in harsh environments. Low power consumption provides long battery life. The condition of the main batteries is reported as an element in the data array.

Data memory consists of 320K bytes of EEPROM. This translates into a memory storage capacity of 16,000 arrays for the LC-2 and LC-2A\*, 10,666 arrays for the LC-2×4 and 3,555 arrays for the LC-2×16. Each array consists of the datalogger ID, day (Julian or month/day format), time (HHMM), seconds, main battery voltage, datalogger temperature, vibrating wire sensor reading (in engineering units) and the sensor temperature.

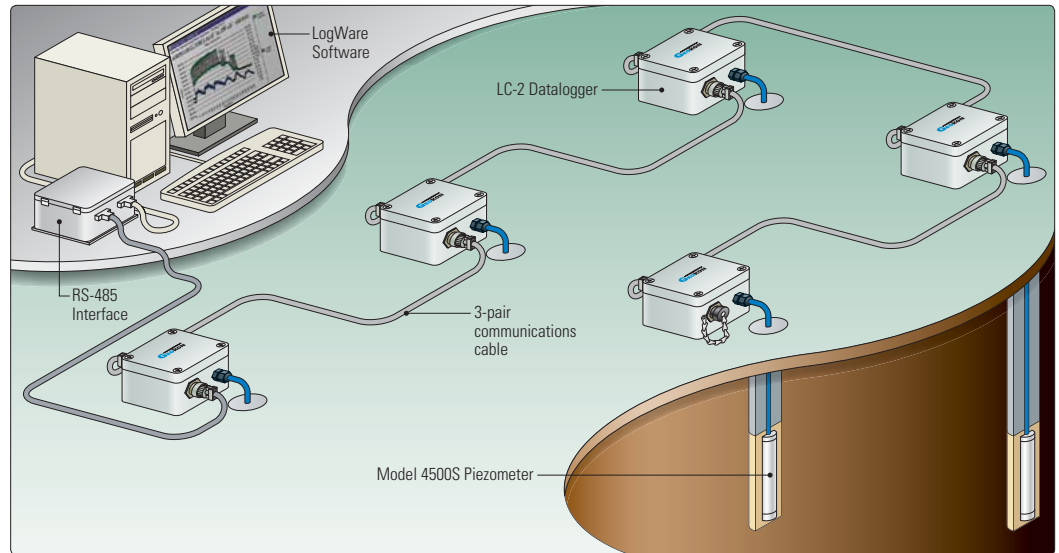
The array transmission is in comma delineated ASCII text, for easy importation into popular spreadsheet programs.

The measurement interval is programmable between 2 and 99,999 seconds (27.7 hours). For the LC-2 and LC-2A, up to 6 intervals may be specified from a logarithmic table, with a maximum of 2555 iterations. The programmed intervals can be started or stopped once at preset times of the day.

\*8,000 arrays when used with LogWare software. **Please note:** LogWare cannot be used with the LC-2×4 or LC-2×16 (a terminal emulator program is required—see the section labeled "Software (LC-2×4, LC-2×16)").



● Two Single-Channel, LC-2 Dataloggers monitoring Vibrating Wire Piezometers.



● Typical RS-485 datalogger network.



● Single-Channel, LC-2 Datalogger, used in conjunction with Model 4675LV Vibrating Wire Weir Monitor, to measure seepage in dam gallery.



● Model 8002-4-1 (LC-2x4) 4-Channel Datalogger with cover removed to show interior detail.

### Power

The LC-2, LC-2A and LC-2x4 are powered by two, easily accessible, alkaline D cells, and the LC-2x16 by 4 alkaline D cells (or from an external 12 V source). Battery life can be as long as one year depending on the reading interval. For extended battery life a solar panel can be connected to rechargeable batteries.

### Communications

The Model 8002 LC-2 Series Dataloggers are available with a standard RS-232 Serial Interface or with a direct

USB 2.0 connection to a laptop computer; patch cords are supplied for this purpose.

Battery powered modems are available for the LC-2 Series, which allows remote programming and interrogation. The LC-2 Series also supports an optional RS-485 system, allowing up to 256 dataloggers to share a single 3-pair communications cable. An adaptor is available to interface the host computer, or phone modem, to the RS-485 network. Radio transmission systems are available as well (please contact Geokon for details).



● Model 8002-4-1 (LC-2x4) 4-Channel Datalogger.



● Model 8002-16-1 (LC-2x16) 16-Channel Datalogger opened to show interior detail.



● Model 8002-16-1 (LC-2x16) 16-Channel Datalogger.

### Software: LC-2, LC-2A

LogWare Software simplifies the task of configuration, communication, monitoring, data collection and data reduction using the Geokon LC-2 or LC-2A. The software is a multiple document interface (MDI) type application designed for Windows® (compatible with Windows® 95, 98, NT, XP, XP Pro and Vista).

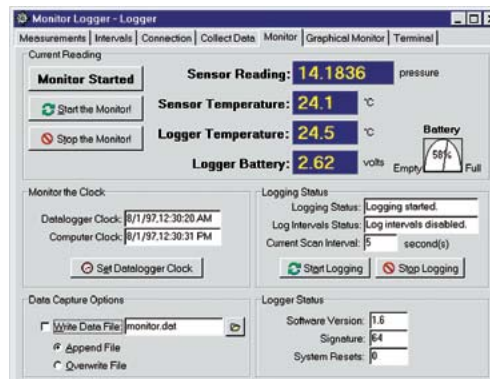
The configuration, data collection and monitoring form includes a screen for measurements, intervals, connection and data collection configuration, a real-time text based monitor, a graphical monitor and terminal emulator. The data reduction form includes a data file editor, Excel® compatible spreadsheet and charting component.

The spreadsheet can load and save Excel® files as well as create HTML tables for use on the Web. The charting component includes over 40 different types and varieties of charts.

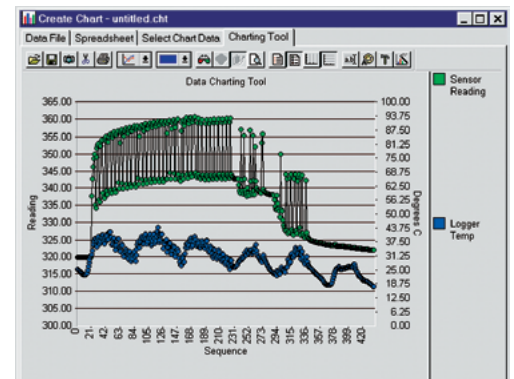
The charting and spreadsheet components are Windows® OLE compliant allowing easy "cut-and-paste" operations between the screens of LogWare and other applications such as spreadsheet and word processing software.

### Software: LC-2x4, LC-2x16

For the LC-2x4 and LC-2x16, datalogger configuration and control is accomplished through a simple terminal emulator program such as HyperTerminal for Windows®, or equivalent. Stored data is easily formatted for spreadsheet analysis.



● LogWare screen: "Monitor Logger."



● LogWare screen: "Create Chart."

## Technical Specifications

	Single-Channel	4-Channel	16-Channel
	LC-2, LC-2A	LC-2x4	LC-2x16
Measurement Accuracy	0.05% F.S. (450-4000 Hz)	0.05% F.S. (450-4000 Hz)	0.05% F.S. (450-4000 Hz)
Measurement Resolution	1 part in 20,000	1 part in 20,000	1 part in 20,000
Program Memory	24K FLASH	24K FLASH	24K FLASH
Data Memory	320K EEPROM	320K EEPROM	320K EEPROM
Data Connection	RS-232, USB or RS-485	RS-232, USB or RS-485	RS-232, USB or RS-485
Storage Capacity (Arrays)	16,000 <sup>1</sup>	10,666	3,555
Temperature Range	-40°C to +60°C	-40°C to +60°C	-40°C to +60°C
Temperature Measurement	(accuracy) 2.0% F.S. (resolution) 0.1°C	(accuracy) 2.0% F.S. (resolution) 0.1°C	(accuracy) 2.0% F.S. (resolution) 0.1°C
Communication Speed	9600 bps	9600 bps	9600 bps
Communication Parameters	8 data bits, no parity, 1 stop bit	8 data bits, no parity, 1 stop bit	8 data bits, no parity, 1 stop bit
Power Supply	3 VDC (2 Alkaline 'D' cells)	3 VDC (2 Alkaline 'D' cells)	3 VDC (4 Alkaline 'D' cells)
Communication Current	< 100 mA	< 100 mA	< 100 mA
Measurement Current	< 200 mA	< 200 mA	< 200 mA
Quiescent Current	< 500 µA	< 500 µA	< 500 µA
Operating Time	10 days - 3 years	10 days - 3 years	10 days - 3 years
Sensor Connection	(LC-2) Hard wired (LC-2A) 10-pin Connector	Hard wired	Hard wired
L × W × H	122 × 120 × 91 mm	260 × 160 × 91 mm	318 × 277 × 159 mm <sup>2</sup>

<sup>1</sup>8,000 arrays when used with LogWare software.

<sup>2</sup>Does not include mounting feet.

## Ordering Information

	Single-Channel	4-Channel	16-Channel
Data Connection	LC-2, LC-2A	LC-2x4	LC-2x16
RS-232	Model 8002-1-1, Model 8002-1A-1	Model 8002-4-1	Model 8002-16-1
USB	Model 8002-1-2, Model 8002-1A-2	Model 8002-4-2	Model 8002-16-2
RS-485	Model 8002-1-3, Model 8002-1A-3	Model 8002-4-3	Model 8002-16-3

## System Requirements

	LogWare Software (for use with LC-2 and LC-2A only)
Processor Requirements	486 running at 25 MHz (minimum) Pentium®/Pentium Pro/Pentium II (or equivalent) or higher running at 166 MHz or better (recommended)
Memory Requirements	8 MB (minimum), 32 MB or more (recommended)
Hard Disk Requirements	12 MB (minimum), 20 MB or more (recommended)



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