

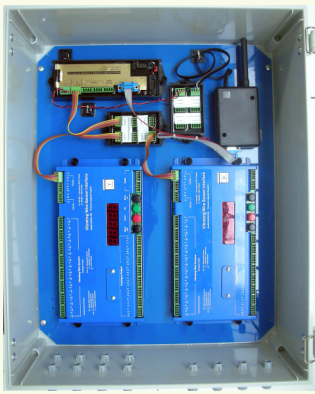
Ezi-LOG

Remote Data Acquisition & Reporting Systems

By Keynes Controls Ltd



- **Automatic Data Acquisition & Reporting Systems**
- **Low Cost Data Transfer - Standard Mobile Phone SIMM**
- **CSV Data File Format**
- **E-mail Alarms & Data Reports**
- **User Defined Formulae - Convert Data To Engineering Units**
- **Web Page Configuration**
- **Fully Integrated Hardware Solutions**
- **Third Party Sensor Support**
- **Free Windows Application Software Charts & Panel Meter Displays**

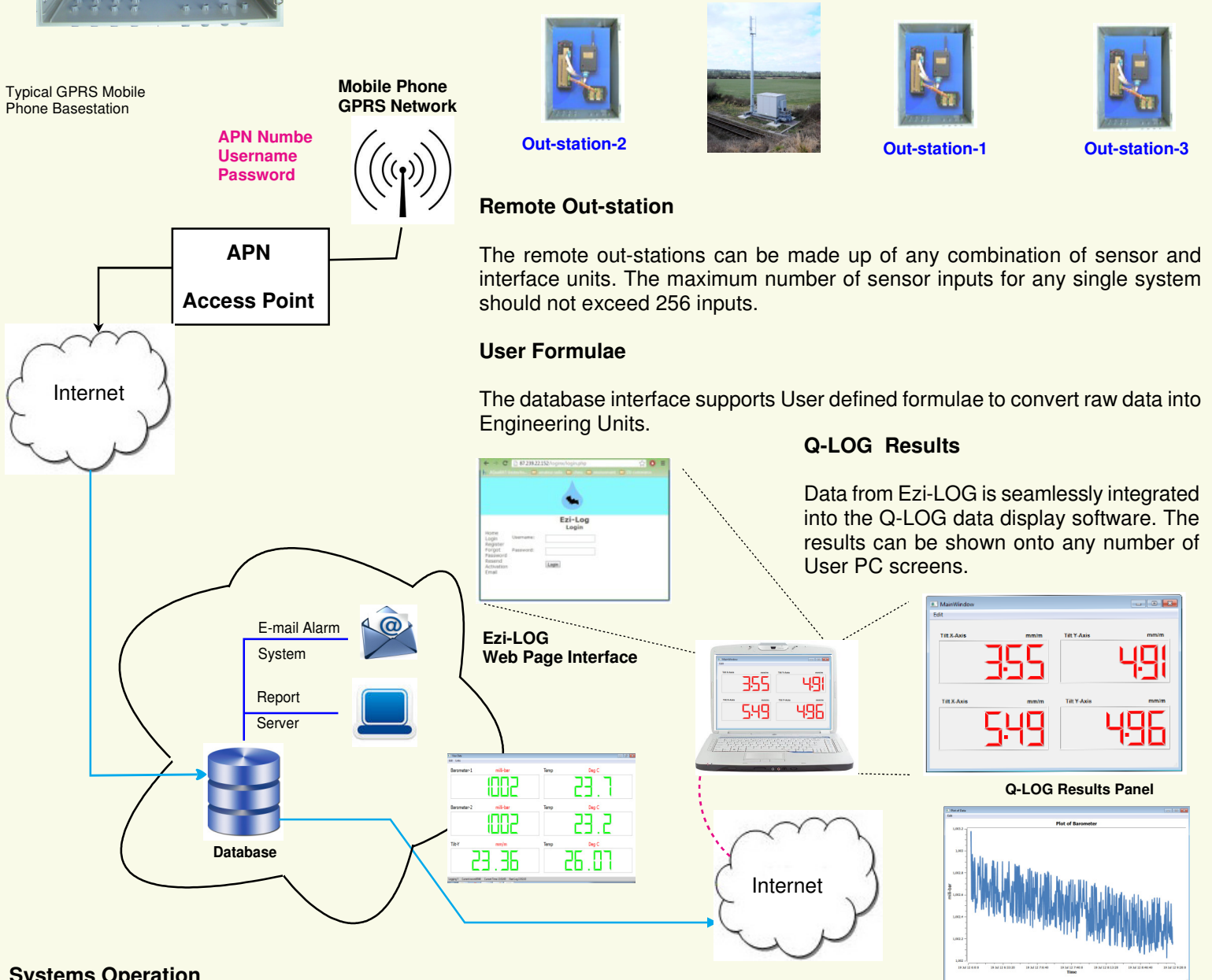


Typical GPRS Mobile Phone Basestation

Ezi-LOG Web Interface - Systems Overview

Ezi-LOG is the Keynes Controls remote data acquisition and reporting system designed to operate with the AquaLOG range of data loggers. The software uses a series of Web pages to setup and control any number of remote data acquisition systems.

There is no limit to the number of individual outstations that can be added to Ezi-LOG. Each system is individually configured and all data independently stored into a database. An E-mail alarm system instantly reports events that are shown to go outside a preset levels.



Systems Operation

The remote data recording is undertaken using the AquaLOG data logger with GPRS modem. The AquaLOG is used as the interface to all of the intelligent sensors and interfaces. Data is initially recorded by the AquaLOG and transmitted in blocks across the GPRS mobile phone network by the modem. Each block of data in the database is checked with the samples in the logger to make sure items are correct. Any errors are automatically corrected. The AquaLOG currently stores up to 250 x 8K records or 32 x 64K records so it is ideal for long term remote recording operations.

The monitoring systems can be made up of any combination of sensors and interfaces. The sensors can be any device supporting the SDI-12 digital network and industry standard commands, be they manufactured by Keynes Controls or third party.

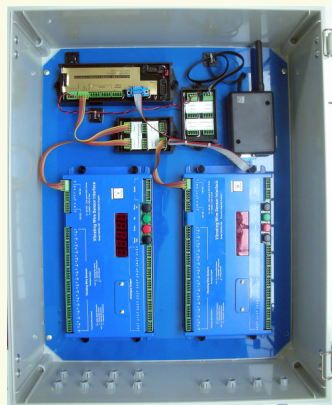
Data is gathered from each sensor and stored into a data-table within the logger. After a preset number of records have been stored, then the logger activates the modem and connects to the Internet via a Access Point. The new data values from within the logger are sent via the Internet to a database and stored into a dedicated database table unique for each logger system. The data stored into the external database will be an exact copy of that stored within the logger.

All of the features of the reporting system are set using the Ezi-LOG Web interface page. The Ezi-LOG Web interface can be accessed and used by any suitable device supporting a Web browser and with Internet access.

Data Operations

Once the data is stored into the database it can be processed by User defined formulae to convert raw data into engineering units. This makes systems perfect for applications such as water level recording when barometric conversion in real-time is required, and for vibrating wire sensor systems where the data from the sensors are converted into Engineering units.

An E-mail alarm system offers can be used to examine the incoming data and to send a series of alarm messages upon detecting events that exceed preset conditions. The E-mail alarm system is fully configured using the Ezi-LOG Web interface and can be re-configured at any time to suit changing project requirements.



Stand-alone Vibrating Wire Logger System used with Ezi-LOG Interface



GPRS Modem

Standard mobile phone SIMM

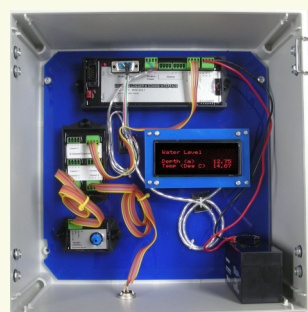


AquaLOG Data Logger & Communications Interface

Automatic Data Reporting

The main use of the Ezi-LOG software is to create a simple and automatic method to access remotely acquired data values from the data acquisition systems. Automatic data reports are sent to the User as a series of E-mails with the new data appearing as an attached file. The data is in CSV format. A free applications program is available that can be used to extract the data file attachments from the E-mails and when used collaboration with the Q-LOG applications program creates a single data file storing all the data being sent by the Logger.

Sending data by E-mail gets around nearly all Internet security systems without the User having to make any special arrangements to use the system. E-mails can be accesses by many different types of intelligent devices.



Applications

Water Level Recording with Automatic Barometric Correction

Structural Monitoring Systems

Silo Monitoring

Remote Weighing Systems

Environmental Monitoring Applications

Keynes Controls can supply complete off the shelf solutions ready for installation including software configuration for the creation of data directly into engineering units..

Hardware

The AquaLOG data logger and GPRS modem are the standard building blocks for the remote data acquisition systems that can be used with the Ezi-LOG Web Interface.

Up-to 250 Sensor Inputs

Advanced Power Management

Modem Power Cycling

User Formulae

SDI-12 Communications

Vibrating Wire Sensor Interfaces

Analog Sensor Inputs - Strain gauges, Load cells, thermocouples.

Third Party Sensor Support

Web Pages

After the User has logged in the Web page shown opposite will appear.

The Web page provides access to the system features for configuration and use.

For each reporting system that is sent out a unique data-table identifier is provided. The identifier number is assigned by Keynes Controls and cannot be adjusted by the User. The identifier number is used to maintain details for all the data from a specified remote data acquisition system that is stored into the database.

Timing

The real-time clock within the data-logger is re-set after each connection and download operation.

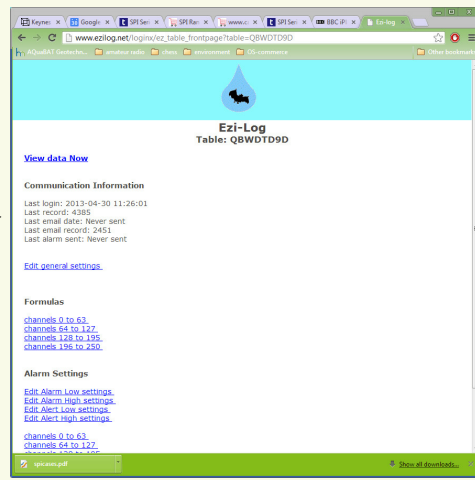


Data-table Identifier number

The number is unique for each remote out-system and is used to identify the which system create the data that has been stored

Systems Information

Details are updated automatically and shows the status of the database



Ezi-LOG Configuration Page

E-mail address for the User to receive alarm message

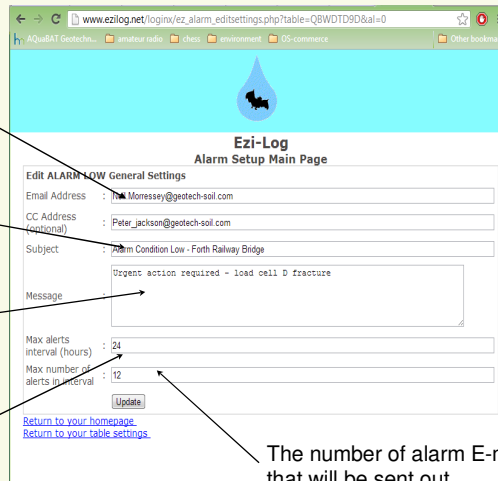
E-mail Alarm Subject

This is used to provide unique identification for the alarm condition

Message

Automatic message content sent out with each alarm. This can be used to provide additional system information.

Period of time in Hours over which the E-mail alarms are sent.



The number of alarm E-mails that will be sent out.

Systems Configuration

After completing the Login operation then the following Web page will appear.

The main systems configurations are carried out from this Web page.

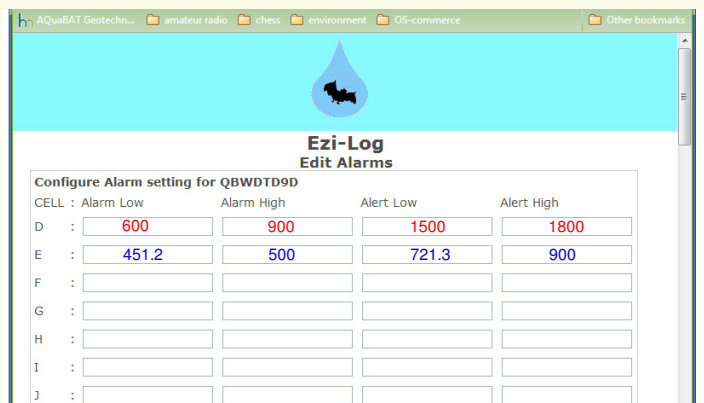
Select the operation to be undertaken.

E-mail Alarm Configuration

The image opposite shows the Ezi-LOG configuration Web page for the alarm system.

The alarm system is fully User configurable and is independently set for each remote outstation and data-table.

The alarm system can be identified by setting the 'Subject' and 'Message' menu items.



Ezi-LOG Alarm Configuration Page

Setting the Alarm System Levels

Configuring the alarm levels could not be easier.

There are 2 levels of alarm that can be set. Alert is generally used for the outer limits. Alarm is used for the higher level limits.

Using the spread sheet type table simply type the values for the alarm conditions into the cells.

Cell 'A' opposite shows an example of strain gauge levels in units of micro-strain. The data values already supplied in engineering units from the logger system. Strain gauge values being an optional parameter in the use of the AquaDAT interface.

Cell 'B' shows alarm level settings for a vibrating wire sensor in units of Hz.

Instant Data Access

Ezi-LOG offers instant data access to the recorded information from any location using a suitable Web browser. Data can be observed directly on a laptop or PC and even the more modern smart phones.

Data from the table can be copied from the screen and pasted directly into third party applications such as Microsoft Excel.

Q-LOG Applications Software

Q-LOG is the free Microsoft Windows application that runs on any modern PC and is used to create and automatically update, a single CSV format data file that contains all the data that has been gathered remotely. The data file will be a copy of the log file maintained in the remote logger units.

Record	Time	A	B	C	D	E	F	G	H	I	J	K	L	M
4354	2013-04-29 20:18:01	0	2.040	0.322	1.524	4.244	4.693	5.129	5.553	5.96	6.354	6.732	7.093	7.437
4355	2013-04-29 20:18:01	0	3.321	5.769	1.533	4.693	5.129	5.553	5.96	6.354	6.732	7.093	7.437	7.761
4356	2013-04-29 21:26:01	0	3.769	4.244	1.542	5.129	5.553	5.96	6.354	6.732	7.093	7.437	7.761	8.085
4357	2013-04-29 21:26:01	0	4.244	4.693	1.553	5.553	5.96	6.354	6.732	7.093	7.437	7.761	8.085	8.409
4358	2013-04-29 22:26:01	0	4.693	5.129	1.564	5.96	6.354	6.732	7.093	7.437	7.761	8.085	8.409	8.733
4359	2013-04-29 22:26:01	0	5.129	5.553	1.575	6.354	6.732	7.093	7.437	7.761	8.085	8.409	8.733	9.057
4360	2013-04-29 23:26:01	0	5.553	5.96	1.586	6.732	7.093	7.437	7.761	8.085	8.409	8.733	9.057	9.381
4361	2013-04-29 23:26:01	0	5.96	6.354	1.597	7.093	7.437	7.761	8.085	8.409	8.733	9.057	9.381	9.705
4362	2013-04-30 00:26:01	0	6.354	6.732	1.608	7.437	7.761	8.085	8.409	8.733	9.057	9.381	9.705	10.029
4363	2013-04-30 01:26:01	0	6.732	7.093	1.619	7.761	8.085	8.409	8.733	9.057	9.381	9.705	10.029	10.353
4364	2013-04-30 01:26:01	0	7.093	7.437	1.630	8.085	8.409	8.733	9.057	9.381	9.705	10.029	10.353	10.677
4365	2013-04-30 01:26:01	0	7.437	7.761	1.641	8.409	8.733	9.057	9.381	9.705	10.029	10.353	10.677	10.999
4366	2013-04-30 02:26:01	0	7.761	8.085	1.652	8.733	9.057	9.381	9.705	10.029	10.353	10.677	10.999	11.323
4367	2013-04-30 02:26:01	0	8.085	8.409	1.663	9.057	9.381	9.705	10.029	10.353	10.677	10.999	11.323	11.647
4368	2013-04-30 03:26:01	0	8.409	8.733	1.674	9.381	9.705	10.029	10.353	10.677	10.999	11.323	11.647	11.971
4369	2013-04-30 03:26:01	0	8.733	9.057	1.685	9.705	10.029	10.353	10.677	10.999	11.323	11.647	11.971	12.295
4370	2013-04-30 04:26:01	0	9.057	9.381	1.696	10.029	10.353	10.677	10.999	11.323	11.647	11.971	12.295	12.619
4371	2013-04-30 04:26:01	0	9.381	9.705	1.707	10.353	10.677	10.999	11.323	11.647	11.971	12.295	12.619	12.943
4372	2013-04-30 05:26:01	0	9.705	10.029	1.718	10.677	10.999	11.323	11.647	11.971	12.295	12.619	12.943	13.267

Ezi-LOG Data

User Formulae

There are many applications where customised data processing is required. An example where a large number of different calculations are required is in structural monitoring systems, Frequently applications use sensors from many different manufacturers, and each sensor requires its own specialised calculation to get data values into engineering units. Q-Log supports User defined formulae so that customised calculations can be used.

Ezi-LOG Formulae Web Page

Example Application

The Ezi-LOG User formulae are assigned in exactly the same format as used by the common spreadsheets such as Microsoft Excel.

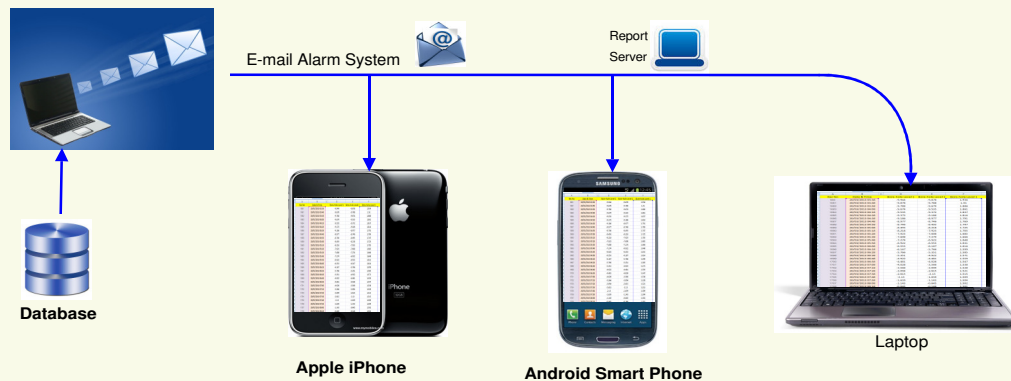
The example opposite demonstrates how easy it is to undertake barometric conversion for water level recording. A PEIZO-RM water level sensor is being used to monitor water local water for a river and a separate barometer module is recording the local barometric level, both of the sensors are reporting data for storage into datatable QBWDTD9D. The PIEZO-RM sensor reports water height in units of mH₂O [4 °C] and the barometer in units of milli-bars.

Cell G shows how the true water height is calculated after correction for local barometric levels in units of mH₂O [4 °C] .

Q-LOG Data Display & Recording Software

Q-Log is the Keynes Controls Data Recording and Display software that is used as the interface between the Ezi-LOG Web interface and computers running on the Microsoft operating systems. Q-LOG combines the data from the incoming E-mail file attachments to create a single CSV file for analysis in third party packages such as Microsoft Excel, Matlab and Maple.

This software has been developed by Keynes Controls with the aim of ensuring data integrity, remove where possible the users requirement to understand any programming techniques, and to give easy access to the remotely acquired results.



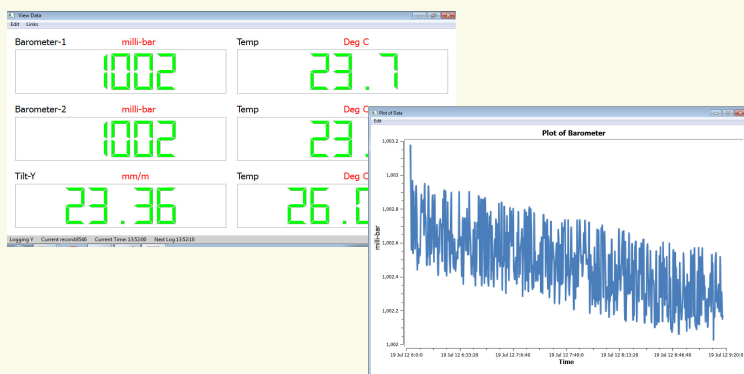
Multiple Devices

So long as a device can connect to the Internet then data can be sent out automatically. The information can be data for local analysis on a spreadsheet macro, or E-mail alarms to advise site engineers of potential problems.

The E-mail alarm system can be seen on devices such as the Android smart phones or the popular iPhones.

Results Screens

The main method of accessing and plotting the results from the remote data acquisition systems is by using the Q-LOG display software running on a laptop or desktop Windows PC. Information is shown as a series of panel meters or time history plots.



Systems Customisation

The Ezi-LOG software has been designed from the start to make data easily accessible and allow interfacing to third party applications.

The Ezi-LOG software can be customised to suit many different processes. The customisation can include dedicated charts and results screens or any web page based object.

Keynes Controls is a complete systems provider and manufactures all of the data acquisition hardware shown on the web site. The company also the author of the Ezi-LOG software so support for all applications is guaranteed.

Keynes Controls offers pre-configured ready to install systems to suit many different applications. Call for quotation or to discuss any requirements.