

## W15 MEMS PIEZOMETER MODEM LOGGER

Datasheet W15



### Description

The MEMS Piezometer Modem Logger combines a high capacity GSM/GPRS enabled datalogger with a small diameter MEMS Piezometer for use in fully or partially saturated soil and rock.

Readings are stored on a local SD card and are transmitted in engineering units to any FTP site via the on-board Quad band GSM/GPRS modem. Logger settings are easily configured by the user making the device completely adaptable to site changes.

The Logger incorporates an intelligent 'passive' to 'active' alarm system with up to six user defined prioritisation thresholds, reducing battery consumption and an overload of needless data.

The sensor element prevents the inclusion of gases and contains hydrophilic properties that ensure the functionality of the sensor, ensuring low noise levels and excellent stability.

The addition of a rain gauge allows correlation between rainfall and ground water level changes.

The MEMS Piezometer Modem Logger provides high accuracy, barometric correction, automatic data transmission and active alarming in one simple device, making it an ideal solution for automatic pore pressure measurements.

### Features

- Integrated barometric sensor
- High grade sensor element & filter
- On-board GSM/GPRS modem
- Data delivered in engineering units
- Intelligent alarming with 5 user defined thresholds and alarm notification via SMS and FTP
- Optional alarm suppression
- Low power; requires one D-Cell Lithium battery
- Reads 2 channels; a 0-10V or 4-20mA sensor and a pulse sensor
- Integrated barometric pressure sensor
- Micro SD card
- Optional rain gauge

### Benefits

- Enables measurements of pore water pressure only
- Ensures low noise & excellent stability
- Data delivered direct to 'ARGUS' Software via FTP
- No post-processing of data required
- Swift notification of changes in site conditions, alerting multiple users
- Reduces the likelihood of false alarms
- Operates for up to 2 years without battery change
- Intelligent dual sensor capability
- Atmospheric pressure compensation
- Internal logging of millions of data points
- Integrated rainfall data



Comprehensive information about this product and our full range is available at [www.soilinstruments.com](http://www.soilinstruments.com)  
If you would like to speak with someone directly please call +44 (0)1825 765044 or email [sales@soilinstruments.com](mailto:sales@soilinstruments.com)

PRECISELY MEASURED

instrumentation and monitoring

## Operation

The logger is a high capacity two channel datalogger with an integrated barometric compensator. Channel one reads a MEMS 0-10V or 4-20mA piezometer and channel two reads a pulse sensor, such as a rain gauge.

The piezometer is suspended in a borehole or buried in fill and wired into the logger. The logger is attached to any suitable structure using appropriate fixings for the medium it is to be attached to.

The unit can either be programmed manually using a Field PC with a USB cable or remotely via the FTP server by changing the settings file.

The alarm system, SMS functions, reading intervals and schedules can be programmed or changed at any time, quickly and efficiently via the FTP site. The data can then be viewed by anyone at any time; all that is required is an internet connection and the log on details for the FTP server.

The multi layered 'passive' to 'active' alarm system incorporates up to six user defined prioritisation thresholds. Once setup, the Logger remains in 'passive' mode logging at user defined intervals, until any of the pre-set alarm levels are breached, at which point it will automatically switch to 'active' mode and initiate increased data transfer to the FTP site whilst simultaneously sending out multi-level SMS text alerts to multiple contacts.

## Applications

Piezometers are used in geotechnical, environmental and hydrological applications. They can be installed in boreholes and placed in fill materials or open wells to measure water levels or pore water pressures to enable engineers to verify design assumptions and control placement of fill.

Typical applications include:

- Environmental management
- Aquifers
- Tidal effects on coastal soils
- Dams
- Embankments
- Potential landslide sites
- Dewatering excavations
- Tailings lagoons
- Pumping tests
- Monitor seepage
- Control placement of fill

## Associated products

For details on:

Catalogue code:

Standpipe Piezometer

W1

'ARGUS' Monitoring Software

D4

View our full product range on [www.soilinstruments.com](http://www.soilinstruments.com)



THE TECHNICAL RATING FOR THIS PRODUCT:

INTERMEDIATE



As the correct installation of any monitoring sensor or system is vital to maximise performance and accuracy, Soil Instruments makes the following recommendations, for the skill level of the installation contractor.

ADDITIONAL SUPPORT

We offer installation and monitoring services to support this system. For more information please email : [sales@soilinstruments.com](mailto:sales@soilinstruments.com) or call : **+44 (0) 1825 765044**

ADVANCED



The installer is trained and experienced in the installation of this type of instrument or systems, and is ideally a specialist Instrumentation and Monitoring contractor.

INTERMEDIATE



The installer already has previous experience and/or training in the installation of this instrument or system.

BASIC



As a minimum the installer has read and fully comprehends the manual, and if possible has observed these instruments or systems being installed by others.

## Specifications

Piezometer	0-10V	4-20mA
Range (kPa)		250 (absolute)
Output	0-10V	4-20mA (2 wire)
Accuracy		±0.1% full scale
Resolution <sup>1</sup>		0.01 kPa
Over range		400% full scale
Diameter		18mm
Operating temperature		-20 to +80°C
Weight (excluding cable)		115g
Maximum recommended cable length	50m	500m

### Hermetic Sealing

Piezometer	Epoxy resin
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### Sensor Housing

Housing material	316 Stainless Steel
Filter element	Hydrophilic polyethylene
Ingress protection	IP68

### Power

Power supply	1 Lithium (e.g. LiSOCl <sub>2</sub> ) D-cell battery, 3.6V (not included)	
Current consumption	Typically 5mA while reading a sensor	Maximum 25mA while reading a sensor
Battery life <sup>2</sup>	Over 2 years @ 15 minute intervals and daily data transmission	

### GSM/GPRS

Frequency band	Quad band 850/900/1800/1900 MHz
Module	On-board GSM/GPRS modem
Antenna	Internal printed circuit board
SIM card	On-board, SIM lock free

### Datalogging

Logger resolution	12-bit A/D converter and over sampling	
Logging frequency range	User defined, up to 1 reading per second	
Sampling frequency	User defined, sampling typically every 1 second to every 10 seconds (to check against alarm levels)	
Data transfer	Every 24 hours as standard and immediately when user-defined alarm is triggered	

### Data Storage

Memory size	2GB micro SD, capable of storing millions of readings	
Format of reading set	Time stamp, readings in raw or engineering units, information including battery voltage	
Method of data transfer	Via GPRS/FTP and stored locally on the SD card	

### Enclosure

Housing material	Glass fibre, reinforced polyester, corrosion free	
Ingress protection	IP66	

### Physical Properties

Size	L 162mm x W 82mm x H 60mm	
Weight	1kg	

### Cable

Type	4 core Polyurethane (PUR) outer sheath	
Diameter	6.35mm	
Length	15m	
Weight (per metre)	70 grams	

<sup>1</sup>Dependant on readout.

<sup>2</sup>Battery life dependent on frequency of readings and data transmission rates.

## Ordering Information

### Battery and Mounting Brackets to be Ordered Separately

#### MEMS Piezometer and Modem Logger Set

W15 250 GPRS	MEMS Piezometer 250 kPa 0-10V, complete with 15 metres of cable and Modem Logger GSM/GPRS
W15 250 MA GPRS	MEMS Piezometer 250 kPa 4 20mA, complete with 15 metres of cable and Modem Logger GSM/GPRS

#### MEMS Piezometer

W15 250 15M	MEMS Piezometer 0 10V, 250kPa absolute pressure range, fitted with 15 metres of cable
W15 250 CSC	MEMS Piezometer 0 10V, 250kPa absolute pressure range, fitted with customers specified length of cable
W15 250 MA 15M	MEMS Piezometer 4 20mA, 250kPa absolute pressure range, fitted with 15 metres of cable
W15 250 MA CSC	MEMS Piezometer 4 20mA, 250kPa absolute pressure range, fitted with customers specified length of cable

#### Accessories

D8-Mount-Pole	Mounting Bracket for 50mm (2") Diameter pole
TL7-Mount	Wall Mounting Bracket Set
BATT-3.6-19	3.6V Lithium battery; 1 required per logger
W15-Rain-0.2mm	Professional rain gauge, 0.2mm resolution
W15-Rain-Pole	Rain Gauge Mounting Bracket for 50mm (2") Diameter pole

#### Instrument Cable

CA 3.1 4 20IC	Instrument Cable 4 core Screened 20AWG 6.35Ø (per metre)
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#### Manual

MAN-243	Modem Logger
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