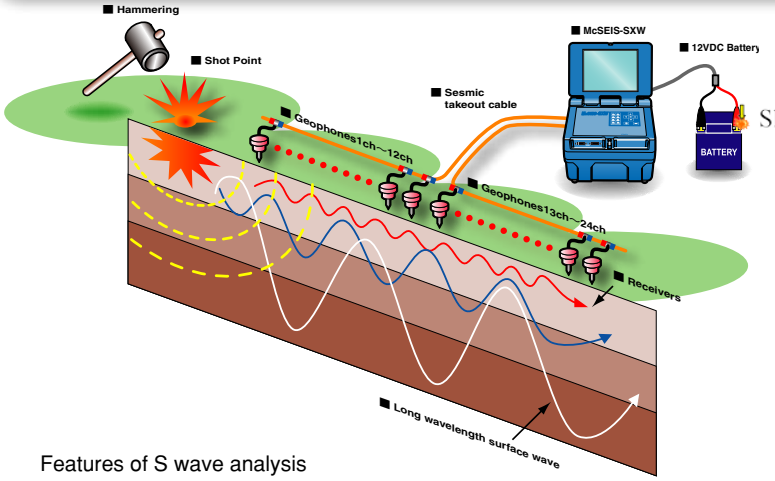
OYO INSTRUMENTS 2010

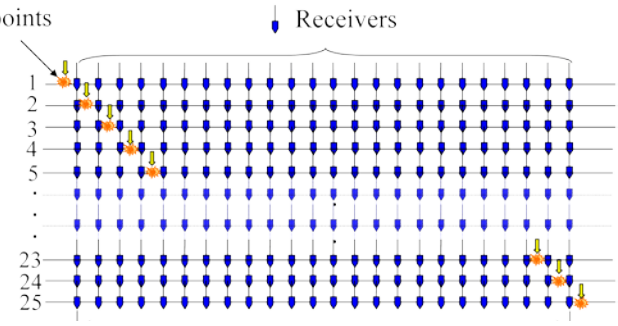
OYO GEOINSTRUMENTS & SECURITY

GEOLOGICAL, GEOPHYSICAL AND GEOTECHNICAL SERVICES AND INSTRUMENTS

Surface Wave Analysis System : McSEIS-SXW

The OYO McSEIS – SXW seismograph has been developed for surface wave analysis and shallow microtremor array measurement, and made it possible to investigate the ground stability on proposed new building developments, for embankment stability and determination of S wave velocities in areas where earthquake disaster prevention measures have been implemented.



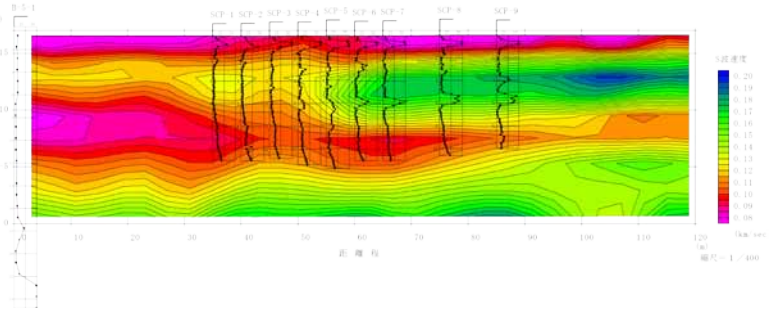


Features of S wave analysis

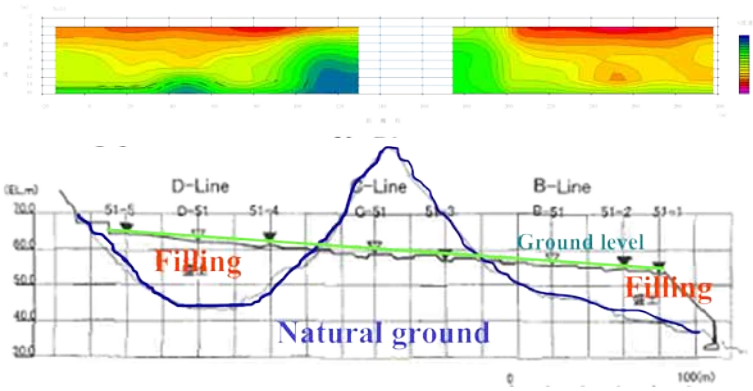
- Using a drop-weight or a sledge hammer as the seismic source then investigation depths of 20m can be achieved.
- CMP analysis with 24ch data makes it possible to improve velocity accuracy and improve the lateral resolution.
- Data acquisition is made easier by the on-screen help menus and addition of the interactive analysis program SeisImager/SW.
- 1D and 2D surface wave analysis as well as 1D micro tremor analysis programs are installed in the McSEIS-SXW.

The propagation speed of the surface wave reflects the S wave velocity of the ground structure. If other frequencies are generated by the seismic source, then surface waves will be at a shorter wavelength represents the S wave velocity in the shallow layers while in deeper ground conditions will give a longer wavelength.

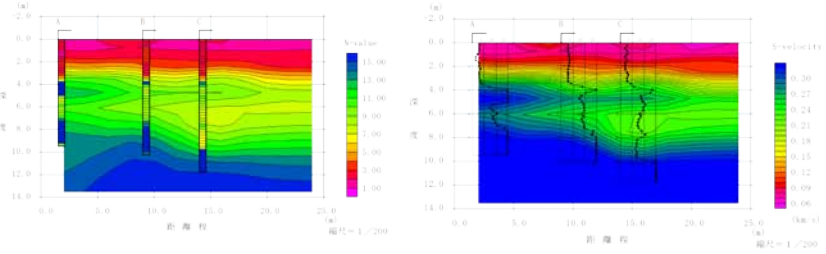
Data acquisition is performed by changing the shot location point step by step along the 24 channel spread line which would be spaced at 1 or 2 m intervals. By acquiring the data from a 24 - 48 m spread line then the investigation depth will be approximately 20m. This feature is different from conventional refraction surveying where you have long survey lines and a large offset to achieve greater depth of investigation.



For land development projects - the S wave velocity distribution can discriminate between the cut and fill of the ground under investigation.



For existing ground structure - the ground condition can be confirmed by seeing the distribution of the S wave velocity.

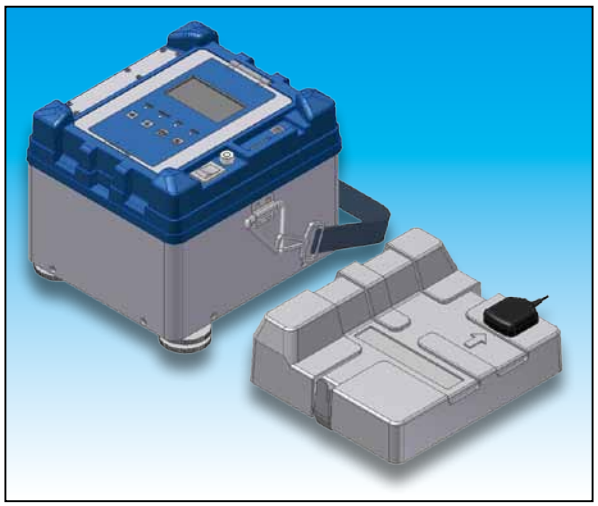


For housing developments - the SeisImager/SW has the function to convert S wave velocity into N value for SPT.

Microtremor Data Acquisition Station: McSEIS-MT Neo

The OYO McSEIS-SXW seismograph enables to investigate up to approx. 20m in depth by 4.5Hz geophones, hammering or weight dropping method to produce two dimensional S-wave velocities (Vs) cross section. The same product also makes it possible to do the microtremor array measurement with 2Hz geophones for deeper investigation with the special seismic take-out cables.
Now you can investigate deeper with McSEIS-MT Neo stations to 50 m or more.

McSEIS-MT Neo



Features:

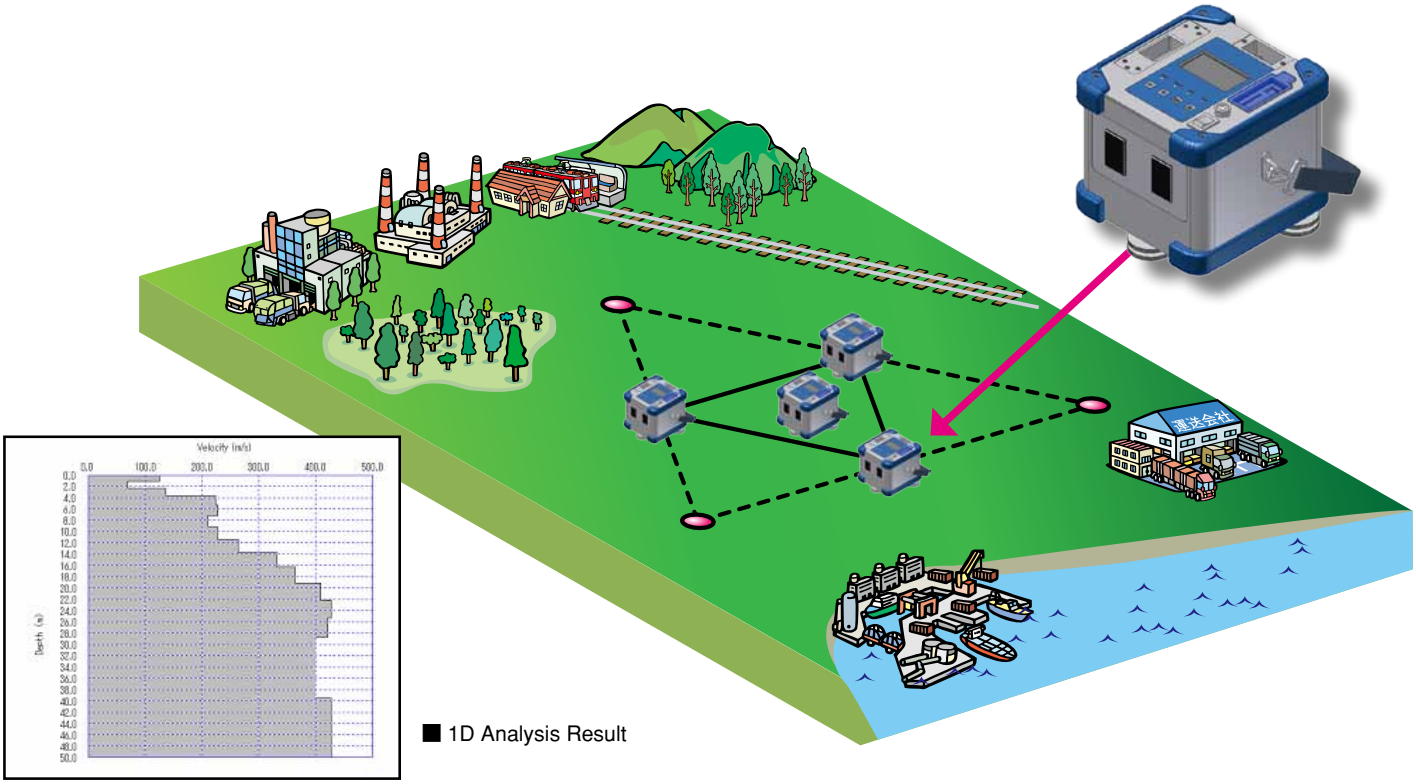
- Four (4) units of McSEIS-MT Neo allow Vs measurement with triangle array for a different depth.
- The measurement is possible without using artificial seismic source at noisy sites where the human activity is overcrowded.
- The Vs structural survey is possible for the depth of several ten meters to several thousand meters.
- Uploading of measurement parameters from the SD memory card makes it possible to start recording without any difficulties.
- GPS clock in each station allows synchronizing all recordings.
- The data processing software for microtremor array measurement is available.

McSEIS-MT Neo is the data acquisition station with the 3-component-accelerometer sensor and GPS clock receiver having the function of continuous recording and time synchronization for microtremor array measurement and vibration monitoring.

McSEIS-MT Neo does not require any artificial seismic source such as hammering or weight dropping but records vibration propagated in the surface of ground, that is surface wave, generated by traffic noises and industrial vibration, natural phenomena such as ocean waves at seashore and winds, then analyze its phase velocity to produce S-wave velocity structure of the ground.

The investigation from several ten meters to several thousand meters is possible by the triangle microtremor array with four(4) McSEIS-MT Neo or more. Therefore, in order to secure the earthquake-proof security of an important structure such as nuclear power plants, the microtremor array measurement has been applied. The vibration characteristics derived by earthquake has been thought that it was strongly influenced by the ground structure of several ten meters. But now the strong participation of deeper structure to the bed rock is pointed out by many Japanese reports, and as a result this investigation method is being widely used for the study of countermeasures against earthquake disaster in cities.

This McSEIS-MT Neo is also used for the study of vibration characteristics of the ground and structures.



■ 1D Analysis Result

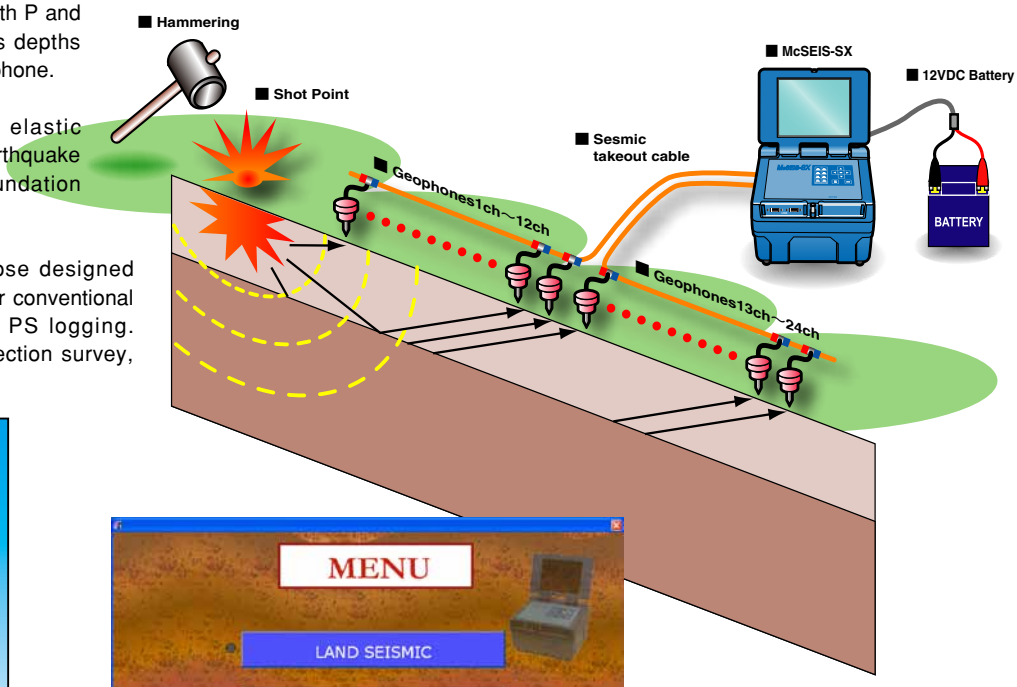
Engineering Seismograph : McSEIS-SX24XP/SX48XP

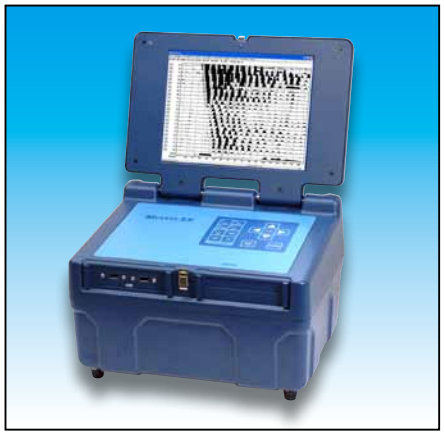
McSEIS-SX24XP & SX48XP are portable engineering seismographs for refraction and simple reflection surveying. They are useful for investigating a number of underground structures for the likes of proposed railways, highways and future dam locations. P wave velocity measurements using a sledge hammer or dynamite at mining sites would allow better selection of the appropriate ripper method.

The seismograph has the function to record both P and S wave velocity of the ground and at various depths with the use of our 3-component clamping geophone.

This allows us to calculate the dynamic elastic coefficient which is an important factor in earthquake resistance design and also for detailed foundation analysis.

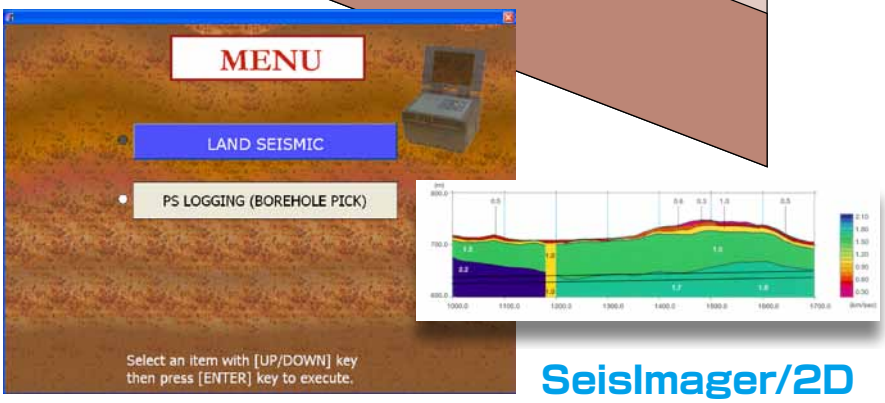
The McSEIS-SX series incorporates purpose designed hardware and menu driven data acquisition for conventional seismic refraction surveys, and borehole PS logging. This series can also be used for simple reflection survey, downhole seismics and vibration monitoring.





McSEIS-SX24(XP)

Model-1125T



SeisImager/2D

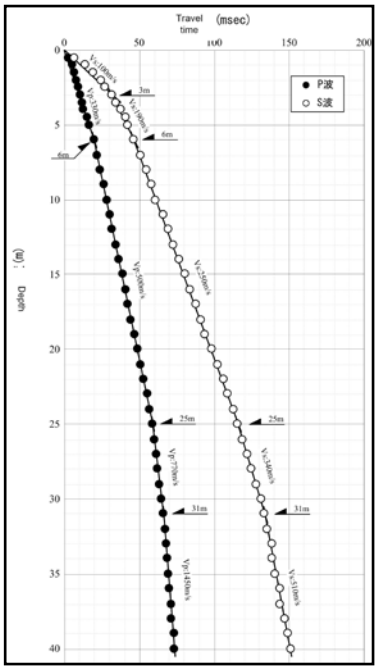
SonicViewer-SX(XP) Model-5251

The SonicViewer-SX is an instrument for the ultrasonic wave velocity measurement of rock samples.
It is possible to measure the P and S wave propagation with high accuracy with using a core sample which is taken out from the drilled borehole.
These OYO transducers are available.
P-wave transducer:200KHz, 500kHz
S-wave transducer:100KHz

BoreholePick3315

Model-3315

PS Logging:
The SX24XP/SX48XP incorporates a PS logging menu in addition to the land seismic refraction survey software. The data acquisition source can be a simple sledge-hammer giving P and S wave tracing via the keyboard operation.



Resistivity Survey/ Borehole Logging

Resistivity surveys are widely used for exploring aquifer layers, cavities and for landslide investigations; detecting fault fracture and alteration zones as well as the understanding of underground water table. The vertical electric sounding, where a set of electrodes moves from one spacing to another, will give a 1D resistivity distribution. The program to interpret 1D data and 2D imaging is also available. Resistivity image profiling where a 2D cross section can be represented has become very popular where the use of automatic switching of electrodes and electrode spacing has been applied.

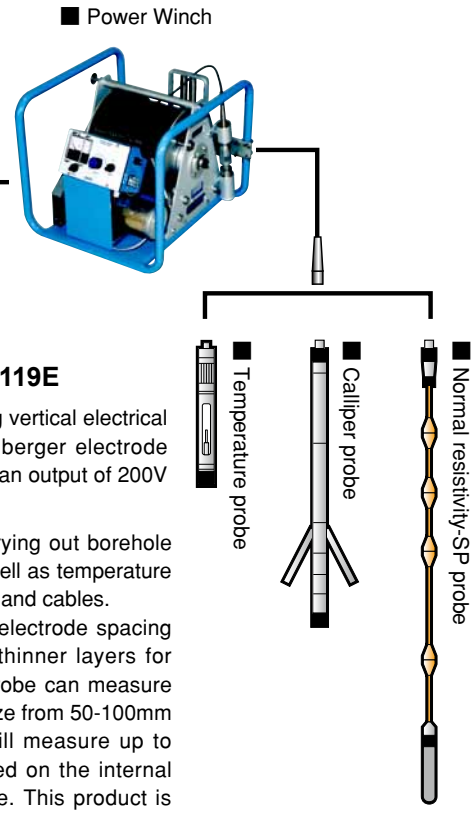
McOHM Profiler-4 is specifically designed for shallow investigation where resisitivity imaging profiles using the pole-pole electrode array are used in addition to conventional vertical electrical soundings.

The unit has a 32 electrode switching function, a 4 channel receiver with 24bit Sigma delta A/D converter, a power supply capable of 400V (800V p-p)/120mA, and the latest PC based controller technology.

McOHM Profiler-4 Model-2140

Features

- Resistivity image profiling using the pole-pole electrode array function
- Decay curve plotting function for the pole-pole array to determine data quality of the site.
- Various electrode selections (pole-pole, pole-dipole, dipole-dipole, etc) for vertical soundings.
- Simultaneous 4 channel measurements to reduce data acquisition time.
- Capable of internally switching 32 electrodes which can be externally expanded up to 288 electrodes for larger surveys.
- Available Power booster to increase the maximum output to 200W



McOHM-EL Model-2119E

McOHM-EL is designed for conducting vertical electrical soundings with Wenner and Schlumberger electrode array patterns for shallow depth using an output of 200V (400Vp-p) at 120mA.

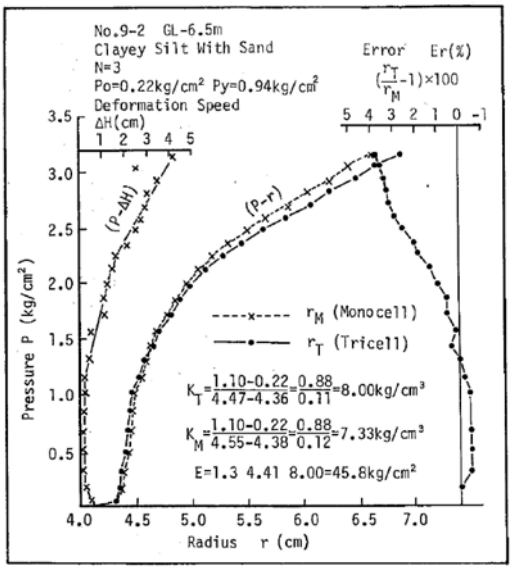
The McOHM-EL can be used for carrying out borehole electrical logging, calliper logging as well as temperature logging using an assortment of probes and cables.
The normal resistivity-SP probe has electrode spacing of 25-50-100 cm in order to detect thinner layers for engineering purposes. The calliper probe can measure the variation of boreholes ranging in size from 50-100mm diameter. The temperature probe will measure up to 70 degC. Logging data can be plotted on the internal thermal printer in real time at the site. This product is ideally suited for engineering applications.

Geologger-GWS Model-3630

Geologger-GWS is a portable borehole logger for shallow depth investigations in particular for ground water exploration and aquifer layers in wells. Measurements are made using the GW Combination probe which has 16" -64" resistivity spacing, SP and natural gamma detection. All this data is collected real time when the probe is deployed in the borehole and can simultaneously print the parameters on the logging chart.
A urethane logging cable is used to connect to the probe for lowering into the borehole which is simpler than using conventional amour cable which may become corroded or kinked. Logging data in CSV format can be transferred to a USB memory stick for further processing on a PC.

Pressure Meter

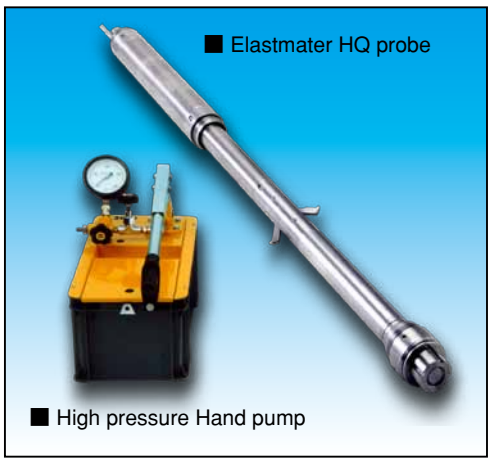
Since 1966 when OYO developed the pressure meter, we have been manufacturing and supplying products to measure soil reaction coefficient K-value, deformation modulus D and elastic modulus E from the pressure meter curve obtained by lateral loading tests at various depths in drilled holes. We adopted a probe with a rubber packer (monocell type) and supply two kinds of pressure meter. The LLT model measures the lateral displacement of the ground, derived from the injected water volume into the probe. The Elastmeter-2 acquires the load pressure and displacement directly by using a pressure transducer and LVDT. Up till now more than 1850 pressure meters have been supplied for utilization in various investigation and construction sites. The monocell type is superior to the handlingness.



LLT-M Model-4189

Measurement of horizontal subgrade reaction coefficient — K value and deformation coefficient for pile designing
Max. loading pressure: 2.45MPa
The displacement of ground is calculated by injected water volume.
Simple structure of the packer probe

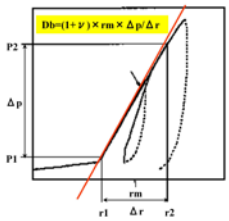
The maximum load pressure for this pressure meter is 2.45MPa with a probe diameter of 70mm (NX). Probe diameters of 60mm and 80mm are also available.
As a result of experimental testing at the early stages of development, it is confirmed that there is very little difference between the monocle and tricell types up to the yield point of the load.

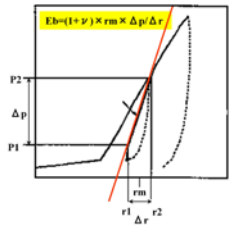


Elast Logger2 (Elastmeter-2)

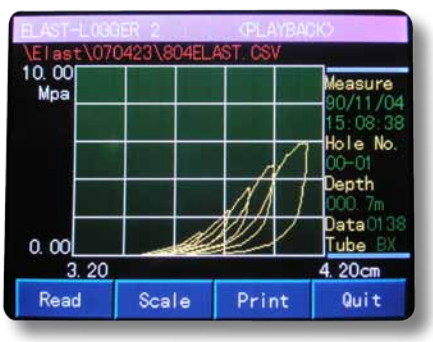
Model-4022 (Model-4180)

The Elastmeter-2 pressure meter is for soft rocks and has a maximum load of 20MPa. The Elast Logger-2 calculates the load pressure and displacement data with correction and displays the pressure meter curve on the screen. This can also be printed on the internal printer. The data is stored in CSV format and can be transferred to a computer using a USB memory stick. These improved functions allow greater efficiency over that of a conventional digital indicator.





Measurement of deformation coefficient and elastic modulus
Max. loading pressure: 20MPa
Direct measurement of displacement and pressure with sensors in the probe
Various calibration functions, data display and data storage as CSV format, CE marked



OYO Monitoring Sensors

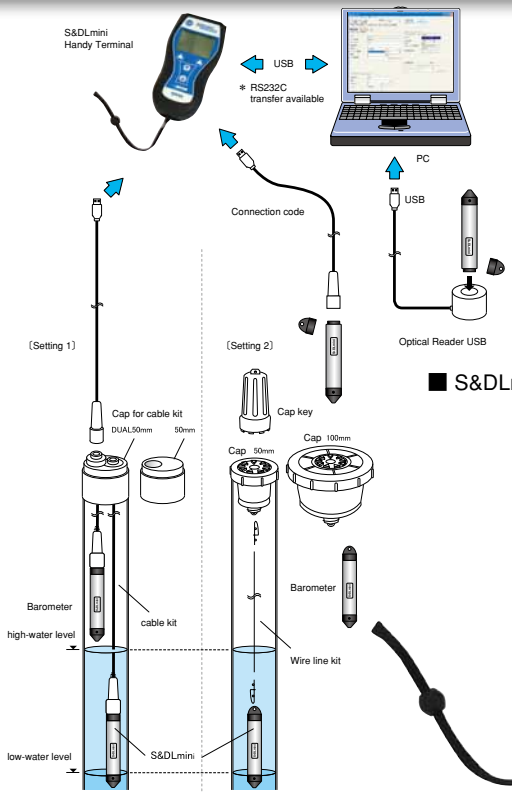
OYO provides the water level sensors and the digital extensometers.
The water level sensors are widely used to evaluate the fluctuation in underground water levels. They are used to see the influence of construction works on underground water tables, levels in monitoring well during and after rainfalls, water level distribution at dam sites, and variations in water wells.
The extensometer is used to monitor the landslide.

S&DL mini Sensor Model-4800

S&DL mini is a very cost effective water level sensor. It has an integral data logger, battery, pressure transducer, temperature sensor and all housed in a small stainless steel (SUS316L) housing. The cable is not vented and desiccants are not necessary. The high performance S&DL mini sensor is accurate and compensates for barometric variations.

Features

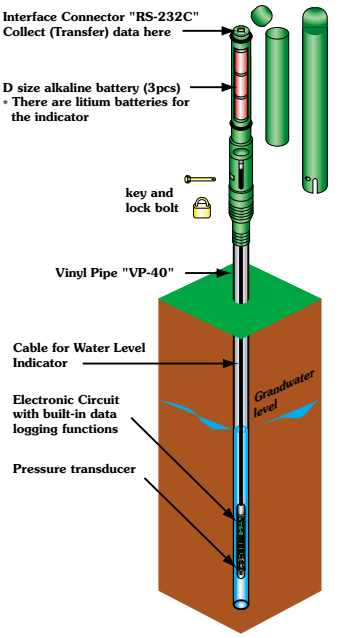
- A cost effective and compact instrument 22mm dia x 150mm (L)
- Available ranges 5, 10, 20, 30, 100m
- Large memory store, 30,000 readings
- Highly reliable



■ S&DLmini Handy Terminal

S&DL Water Level Sensor Model-4677 ／ 4640A

The vented cable water level sensors have a battery holder and RS-232C port at top side, and come in different models for various site conditions. Model-4677 is the standard model with a SUS316 body, to be used in fresh water wells and model 4640A has an anti-corrosion titanium body for use in other wells.
The operator can easily access the data from the internal memory of up to 57,000 records using RS-232C port to a notebook PC. Battery replacement is very simple as it is at the well head. The depth range is dependant on the model and ranges from 5m to 100m.



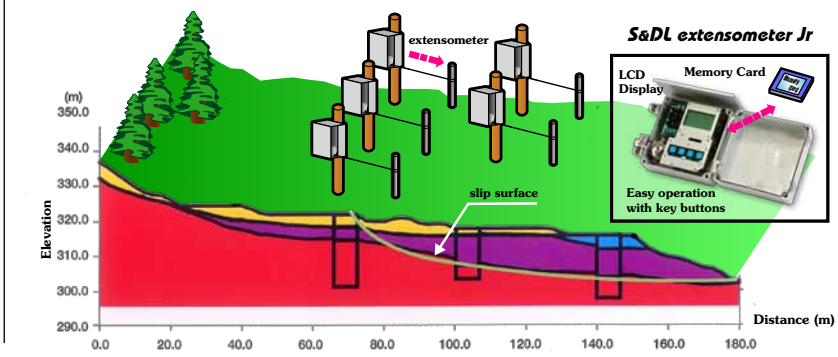
Features

- High quality and compact in size 29mm x 290mm(L).
- Available range: 10, 20, 35, 50 and 100m
- Large memory store 57,000 readings

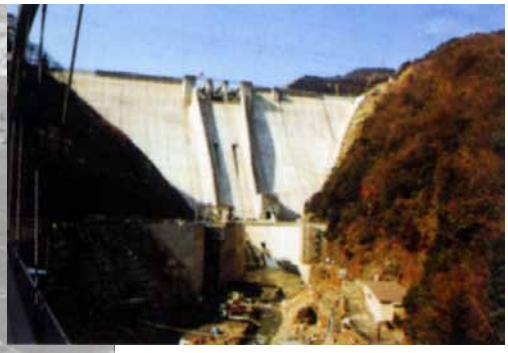
S&DL Extensometer Jr

Model-4737

S&DL extensometer Jr. is a stand-alone sensor to monitor the displacement of lateral movement of the ground at the land sliding area. It provides reliable and high resolution result during the long time monitoring.



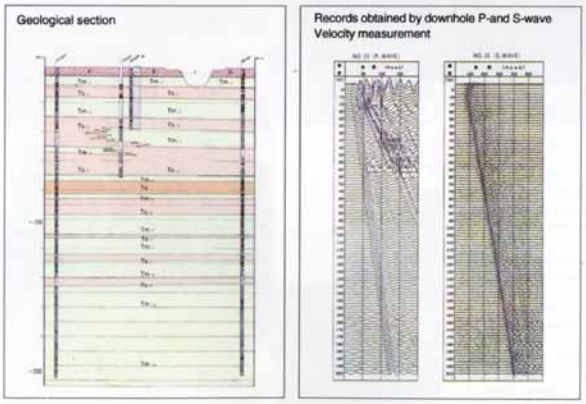
OYO Corporation was established in 1957. Since then we have been conducting various geological site investigations and site construction management relating to projects covering highway, bridge and railway construction as well as skyscrapers and electric power facilities. We have been manufacturing and supplying state-of-the art measuring instruments such as engineering seismographs, resistivity meters, borehole logging systems, lateral load testers (pressure meters) and many other advanced instruments. OYO' s technical skill and instruments are used all over the world.



Miyagase Dam
Geophysical investigations and various in-situ tests were done at the dam site.

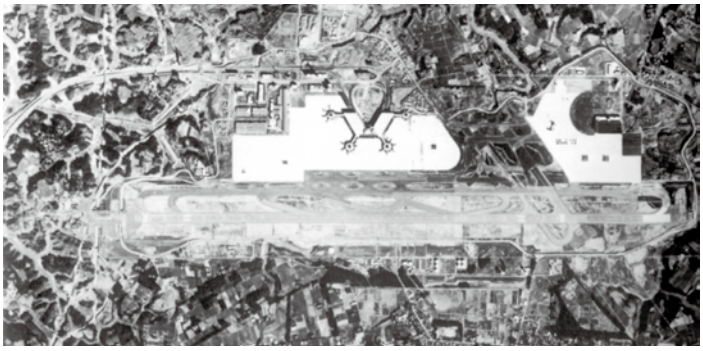
Rainbow Bridge
Various in-site testing instruments were used at site.

Meishin Expressway and Shinkansen in 1959
The site investigation was done by OYO.



Landmark Tower-296m high
OYO handled the site investigations such as PS logging for the construction.

Kansai Airport
We were involved in the project, conducting preliminary sea-floor soils investigations.



New Tokyo International Airport
We conducted the exploration and foundation engineering study of the airport structures,connecting highway and adjoining railway structures.

OYO
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