We communicate the voices of the earth.

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COMPANY PROFILE

PRODUCTS CATALOGUE

MEASUREMENT SYSTEM FOR DISASTER PREVENTION

OSASI TECHNOS INC.

WE PASS ON VOICES OF THE EARTH

Osasi Technos offers “measurement systems for disaster prevention” that contribute toward social safety, based on reliable information.

In 1986, Osasi Technos released a water level gauge, which came to be used for water level measurement in rivers and wells at various places throughout Japan.
Since then, our company has developed diverse measuring instruments such as rain gauges, extensometers, and pipe strain gauges. In 2002, our company developed a communication device for networking these instruments.
Furthermore, our company has realized automatic remote monitoring and continuously improved the performance of our products, exemplified by power-saving technologies not offered by any of our competitors.
Today, we propose measuring instruments to suit the site situations and budgets, ranging from semi-automatic monitoring to remote monitoring systems. These systems are being utilized at diverse sites and purposes, for disaster risk reduction, maintenance, natural disaster countermeasures, and exploration.
We at Osasi Technos are determined to continue developing new products and making improvements, so as to offer products that prove to be useful on sites.

Total support offered by Osasi Technos

Designing and manufacturing devices Designing measuring systems

We design and propose measuring systems that suit the customer’s needs. One of our advantages is that we can customize measuring devices to suit the situations at the site and the usage environment, because these devices are designed in-house.

Installation

We solve various issues we face at the time of equipment installation, which issues differ depending on the usage environment, drawing on our highly reliable technologies we have cultivated over long years and abundant experiences. We install devices taking into consideration the situations of users, so that optimum monitoring system may be established.

Cloud services

We also offer cloud services that are indispensable for efficient and effective monitoring and observation systems. Our services enable customers to start monitoring in a short period of time and with small burdens.

Maintenance

Service life of monitoring devices is prolonged if the devices are inspected regularly.
We possess inspection and repair facilities in our factories in Japan, and offer total support for monitoring tasks that cover maintenance and inspection of devices we have delivered.

Natural Disaster Countermeasures

Flood
Landslide
Debris flow
Slope collapse
Landslide dam

Responding promptly to frequently occurring landslide disasters, drawing on our NETIS-registered technologies
Osasi Technos' immediately deployable automatic monitoring systems that suit the specific local needs

Large-scale landslide disasters have taken place very often in recent years, in line with the growing intensity of typhoons and more frequent occurrences of torrential rainfall. Once a landslide disaster occurs, risks of secondary and tertiary damages rise to an extremely high possibility. In order to protect human lives at the disaster sites, a monitoring system needs to be established immediately for widely disseminating risk information to residents and relevant persons, on a 24-hour basis.
Thus, Osasi Technos developed packet communication devices that utilize mobile phone networks, and commercialized an immediately deployable automatic monitoring system that suits the specific local needs by connecting measuring instruments at the site for transferring observation data to a remote location. The technology has been registered with NETIS (New Technology Information System) of the Ministry of Land, Infrastructure, Transport and Tourism, as a remote monitoring system that may be installed readily and start operation right away.

The system, designed with a high degree of freedom, may be installed at any location

The network product group of Osasi Technos is provided with the unique on-site network technology OSNET as a standard, and does not require a special communication device such as a modem for communications among instruments.
Up to 64 units of related devices, including about 50 units of measuring instruments, may be connected to and managed by a single communication device operated by lithium batteries. Up to 1 km of extension is possible for connection between instruments. Wireless network equipment may also be selected.
There is no limitation regarding the place of installation of measuring instruments at the site, and network equipment may be added flexibly.

Landslide dam

A landslide dam (natural dam) refers to a dam formed naturally at a time of natural disaster such as torrential rainfall, earthquake, or volcanic eruption, as large volumes of sediment and driftwood flow into a river in a mountain area and trap water that flows in from the upstream side.
Landslide dams that are formed suddenly and unexpectedly are structurally vulnerable and unstable. When the trapped portion collapses due to overflowing water, tremendous damages result in the downstream areas.
In order to prevent these secondary damages, measures are provided such as installing water level gauges for monitoring rise in water level, building temporary drainage channels, and removing clods that form the landslide dam.

Debris flow

Debris flow is known as a phenomenon in which unstable sediments that accumulated on a mountainside or in a mountain stream are fluidized due to flooding caused by torrential rain and moved to flow down at once. The power of debris flow is tremendous, and serious damages sometimes result in the downstream regions.
Debris flow is monitored generally by installing wire sensors along streams that could pose risks. The wire sensors are combined with alarms that notify the danger when the wire sensors in the upstream region are broken by impacts of debris flow that has occurred.

Landslide

A landslide is a slope movement phenomenon, whose affected range is relatively large. As a result, daily lives of residents in the area are hindered greatly.
When a landslide occurs due to heavy rain, etc., extensometers, rain gauges, and alarms are installed to keep vigilant at the site and help the residents evacuate. Furthermore, water level gauges, pipe strain meters, clinometers, and other instruments are installed for monitoring, with purposes of clarifying the mechanism of landslide, conducting stability analysis and designing countermeasure structures, and assessing the stability after constructing the countermeasure structures.

Volcanic eruption

A volcanic eruption generates cinders, pyroclastic flow, lava flows, volcanic ash, and volcanic gases, sometimes bringing about huge disasters over a wide area. Furthermore, debris flows and mud flows could take place when heavy rain falls on the spewed rocks and volcanic ash that have accumulated. Such a situation aggravates disaster risks for residents in the downstream regions.
In order to detect a rise in disaster risks caused by increased volcanic activities, continuous measurements are performed using monitoring cameras and gas sensors. Communication devices and alarms are used in addition for promptly notifying the danger to neighboring municipalities and residents in the downstream regions.

Exploration

Landslide
Hydrological survey
Water quality survey
Meteorological survey

Realizes stable operation over long time with commercially available lithium batteries

Thorough power-saving design, which is the most distinctive technology of Osasi Technos, has realized excellent specifications and performances that are unequaled in the industry. Our thinking started with the fact that no power source is available outdoors and batteries wear out eventually. The technology is derived from our design philosophy that places emphasis on continuous data acquisition and storage, offering not only the power-saving features but also the power source back-up function realized by switching between the main- and sub-power sources, and the function to protect the internal data even when the two power sources have been interrupted.
We have also accumulated diverse know-how on weather-proof performances of instruments that are used outdoors where the temperature and humidity conditions are stringent, and have fed back the know-how into product development.
Our efforts have realized stable operation of our product groups over long time, enabling us to win trust of our customers on the products used at sites without a power source.

Osasi Technos continues to meet challenges for improving our products that are used over a long time at outdoor sites

In landslide and hydrological surveys, which are among the areas in which Osasi Technos excels, it is necessary to realize the reliability of measurements so that accurate data may be obtained, operability for facilitating installation and promptly collecting the data, and stability for saving maintenance labor and operating instruments continuously over a long period of time. As a measuring instrument manufacturer, Osasi Technos continues developing and delivering superb-quality products that meet these requirements for certain.

Released in 1988

Released in 1997

Released in
2002 to 2009

Released in
2014 and thereafter

Landslide survey

Extensometer

When measuring the amount of movement of ground surface at the site of a landslide, a pile is installed in each of the mobile and immobile points on both sides of a crack and a wire (invar wire) is spanned between the piles, for measuring changes in the distance. Extensometers of Osasi Technos are also equipped with a function to output an alarm output point when a set amount of displacement has been exceeded while continuously monitoring extension and contraction of the wire. Also, the bending situation of a borehole may be observed by stretching a wire in the vertical direction in the hole (with a vertical-type extensometer). Our extensometers have the resolution of 0.1 mm, so they may be used for monitoring collapse in a bedrock, monitoring displacement of a temporary structure, or other purposes, besides landslide surveys.

Rain gauge

Rainfall is uniform only in a limited area, and precipitation data measured by a neighboring observation station do not always reflect the precipitation at the site of survey. Therefore, it is important to actually measure the precipitation at the site of survey.
Our company offers two types of tipping-bucket rain gauges: 0.5 mm and 1 mm per tip. A heater is also available for use in a cold area. A data logger, which receives contact signals from the tipping bucket and accumulates the data, may also be used as a pulse logger by connecting with a sensor that outputs the contact signals, in addition to being used with the rain gauge. The data logger is also equipped with a function to output an alarm contact.

Pipe strain gauge

A pipe strain gauge comprises a pipe attached with strain gauges at equal intervals; it is installed in an exploration borehole at a landslide site. It is used for estimating the depth of a slip plane, taking into consideration also the results of analyses on boring cores, etc. Our company offers a pipe strain data recorder compatible with the strain gauges (up to 90 channels when an extension unit is attached). There is also a built-in single-channel water level gauge, for measuring the groundwater level in a borehole.

Inclinometer and load cell

Devices like clinometers, anchor load cells, pore pressure gauges, and earth pressure gauges, which are used primarily in civil engineering, are strain gauge transducers with an I/O resistance of 350 ohms. Therefore, our company offers a range of four-gauge strain data loggers. With connection units, our recorders support up to 60 channels of signals from other devices. Thermocouples may also be used. There is also a model with a built-in single-channel water level gauge.

Hydrological survey

Water level gauge

Road, river, dam, and other construction works could affect groundwater, because they change the topography. For this reason, the groundwater levels are monitored continuously in the neighboring areas for surveying the influences, from before the start of construction to a while after its completion. Hydraulic water level sensors of Osasi Technos feature an atmospheric release pipe, which enables accurate water level measurement without being affected by changes in atmospheric pressure caused by varying meteorological conditions. The sensors are available in a wide variety: a voltage output-type, current output-type, titanium made-type, and small diameter-type for narrow areas.
Two types of data loggers are available: a network-type networked with several instruments and provided with a function for centralized management; and a waterproof-type for standalone uses.

Maintenance and Management

Slope monitoring
Reservoir and irrigation channel management
Civil engineering structure monitoring

Computerization improves the labor shortage situations in maintenance and management

Information systems of Osasi Technos realize highly accurate maintenance and management at a lower cost

Deterioration by aging has been a concern for road bridges, tunnels, river structures, sewerage systems, ports and harbors, and other structures constructed during the period of rapid economic growth and thereafter. Shortage of labor and budget for maintenance and management has posed serious problems, due to the vast range of managed structures as well as damages caused by unpredictable and more frequently occurring natural disasters such as earthquakes and torrential rainfall, in addition to the deterioration by aging. Osasi Technos possesses technologies for establishing monitoring systems in a short period of time at low cost, by combining measuring instruments with software to suit the site situations. Drawing on these technologies, we have been making proposals for improving the labor shortage situations for maintenance and management, through computerization.

Our technologies support customers in addressing a wide range of problems in areas

including agriculture, not to mention management of slopes and river embankments
Our information systems enable highly accurate management on a real-time basis, when used for monitoring of minute displacements of slopes, river embankments, etc.
Problems associated with population aging, which have surfaced noticeably especially in the area of agriculture, are extremely serious as the workforce that has been relied upon is gradually diminishing. However, if our information systems are used for water level management of reservoirs and irrigation channels, they will not only save labor but also save resources by offering minutely tailored solutions.

Accurately and constantly monitoring the safety of slopes

Slope management system

Slope protection works such as anchors gradually decline in their degree of safety due to rainfalls and aging after completion. Visual inspections alone are not sufficient for fully clarifying the conditions of these structures.
In view of the situation, Osasi Technos proposes a system for remote centralized management that enables viewing of the conditions of slopes at a glance for an entire route, by installing measuring instruments for measuring the displacement of each slope.
Our devices may be installed readily at any location, regardless of whether power sources and communication devices are available. The feature makes our system an optimum one for continuously monitoring dangerous locations and places of protection works. When an excessive displacement has been observed, the system notifies the risk using an alarm e-mail. Since this function may be operated on a real-time basis and independently from the remote monitoring, it significantly mitigates delay in issuance of risk information, which helps greatly to prevent occurrence of a disaster.

Survey on impacts of horticultural facility operation

Groundwater monitoring system for agriculture

In order to develop protected horticulture of Japan for the future generations of agriculture, future-generation protected horticultural bases are being developed that utilize local resources as energy, with an aim to reduce costs through large-scale collective operation of facilities and planned production that involves advanced environmental controlling technologies utilizing ICT.
However, it should be noted that large volumes of water are used for operating such horticultural facilities. Thus, Osasi Technos has been conducting impact surveys to check whether the volumes of well water taken in by households in the neighborhood are being affected, while the facilities are being operated.

Deterioration monitoring on aging structure

Deterioration monitoring on bridge pier

The bridge pier portion of a bridge spanned across a river is damaged over long years due to scouring caused by the river flow and rising of the river at the time of torrential rain. Even though the safety of the bridge itself could be seriously affected, the deterioration is hard to see because the damaged portion is underwater. Thus, Osasi Technos proposes a monitoring system in which clinometers are installed on the bridge pier portion and an abnormal condition is detected and notified based on the angle of inclination.

Realizing detailed water management through remote monitoring of precipitation and water level

Water level monitoring system for water channel in reservoir

Adjustment of discharged water volume is indispensable for agricultural reservoirs located in upstream regions of rivers. However, in many cases daily management activities have become difficult as aging progresses among farmers. The situation has prevented proper performance of detailed management activities, disabling effective use of the precious agricultural water resources.
In view of the situation, Osasi Technos has developed a system that mitigates management burdens, in which an electric winding machine and a control panel are installed on an existing sloped water intake pipe and the sloped water intake pipe is controlled remotely using communication equipment. The system enables: monitoring of the daily water-level situations on a personal computer at a remote location, utilizing water level gauges and still cameras that have been installed; remote control of the sloped water intake pipe on the personal computer at a time of discharged water volume adjustment; and sending an alarm e-mail at the time of abnormal flooding, for notifying the danger to the reservoir administrator.

Advanced Disaster Prevention

River water level monitoring
Road flooding countermeasures
Reservoir water level monitoring
Tsunami and high tide countermeasures
Facility disaster prevention

Natural disasters cannot be totally prevented. But damages may be mitigated through disaster risk reduction efforts!

No problem at places without a power source. Our emergency disaster monitoring system may be configured right away at the site of disaster.

Intensification of typhoons and more frequent occurrence of torrential rainfall in recent years not only induce large-scale landslide disasters but also cause various problems in maintenance and management of water-related facilities. Prediction of sudden and local torrential rainfalls is extremely difficult, and they have not been properly addressed by today's social systems. Sufficient workers cannot be assigned to wide range of maintenance and management tasks for slopes, road flooding, river embankments, reservoir water level, irrigation channels, etc. As a result, countermeasures could be delayed. The emergency disaster monitoring system commercialized by Osasi Technos may be configured and operated promptly at the site of disaster. This is made possible by the simple networking system utilizing compact measuring instruments. If the technology was used with an on-site information system to be operated over a long period, in addition to being utilized for temporary measures at a time of emergency, a high-performance disaster information system may be configured at a low cost.

Damage minimization by clarifying the risk level and sharing the information!

Using a monitoring system for water level management of reservoirs and irrigation channels, for example, will help not only in saving energy but also in clarifying the risk levels on a real-time basis. The system may be utilized for structures and factors for which the risk level needs to be assessed and measures need to be implemented while clarifying the situations, such as slopes, river embankments, river water level, reservoir water level, irrigation channels, and road flooding.

Promptly detecting flooding and shutting off the traffic

Flood monitoring (for underpasses)

Underpasses are among the places along roads that are difficult to manage. An underpass is a structure built at an intersection between a road and a railway or another road that leads one of them underground, so as to prevent their intersection on the same plane. Many underpasses have been built in urban areas where traffic is heavy.
At a time of torrential rainfall, road flooding takes place suddenly in underpasses due to rapid inflow of rain water from the surrounding areas. Being a topographical structure of a form that retains water, an underpass could witness sudden rise in the flooding water level that in many cases leaves automobiles in the flooding water.
Since it is almost impossible to deal with sudden changes in road conditions at many locations with a limited number of personnel, a system with a water level detection sensor and a notification apparatus, which promptly detects flooding and shuts off the traffic, has proven to be effective.

Tsunami and high tide countermeasures

Tide level information provision system

Osasi Technos proposes an information system through which tide level data necessary for port and harbor management are obtained and the situations of tide level observation are made open to the public using graphs and images, for urging the residents in lowlands and along the coast to evacuate promptly when a flood is anticipated due to tsunami and high tide and thus minimizing damages.

Flood damage

Increase in the occurrences of local torrential rainfalls and gigantic typhoons, which stems from global warming, has aggravated disaster risks each year. Especially on small and medium rivers with relatively small river basin areas, the flow volume increases rapidly even at the time of relatively short torrential rainfall. Since prediction of sudden changes in the water level is difficult, it is not always easy to notify the residents of the risk without delay.
Thus, attempts are being made to enhance the accuracy of flood prediction by installing a large number of simple water level gauges along a river, thereby raising the density of water level measurements of the river.

For preventing reservoir collapse

Reservoir water level prediction system to be used at times of torrential rainfall

Reservoirs have collapsed in an increasing number of cases due to frequent torrential rainfalls. Collapsing of a reservoir could bring about tremendous damages in downstream regions.
In view of the situation, Osasi Technos has, in collaboration with the National Agriculture and Food Research Organization, developed a reservoir water level prediction system capable of judging whether a dam body could collapse at times of torrential rainfall, and how much the water level needs to be lowered in order to ensure safety. The system predicts collapse of a reservoir at a time of torrential rainfall beforehand or on a real-time basis and calculates the necessary prior water discharging volume and the amount of reservoir water level lowering, for preventing the reservoir collapse.

Lineup of water levelgauge products

Water level gauges of Osasi Technos are compact and lightweight and may be installed readily, enabling measurement to start at any location.
The most distinguished feature is that the water level gauges, of thoroughly energy-saving designs, may be used for measurement over a long period using commercially available batteries.
Drawing on the technologies and know-how accumulated in the 30 years since the launch of our first water level gauge, the water level gauges have continued recording the data reliably even in the most demanding outdoor environment.





Water level sensors

■DS-1

Measurements in units of cm (Made of SUS)
Precision: +/-0.1%
*Measurement range:
10 to 100 m

■DS-7

Measurements in units of mm (Made of SUS)
Precision: +/-0.13%
*Measurement range:
0 to 750 mm

■MS-2L

Measurements in units of cm (Made of SUS)
Precision: +/-0.25%
*Measurement range:
10 to 50 m

■PDCR-1830

Made of titanium
Small-diameter
(Sensor diameter: ø17.5)
Precision: +/-0.1%

■その他

Output: 4 to 20 mA
Small-diameter
(Sensor diameter: ø10)
Fit for use in cold areas, and more

Water level data loggers

■WLG-01N

With liquid crystal screen for displaying graphs
Supports networking
With alarm function
Supports SD cards

■ITC-01

With built-in web server function
Internet-connected water level gauge

■WP-1

Waterproof-type
No storage box needed

***Under development**

■NetMAIL-WR

With liquid crystal graph display
With built-in packet communication function
Single channel for water level measurement/ single channel for rainfall measurement
Supports networking

***Under development**

■SFLG-01

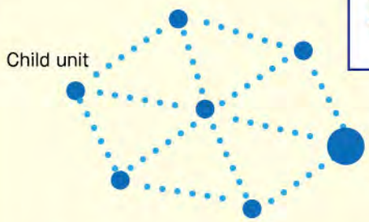
With liquid crystal graph display
With built-in Sigfox communication function
Single channel for water level measurement/ single channel for rainfall measurement

■NetLG-001N

Supports networking
With alarm function

■NetAW-01L・S

Ad-hoc wireless-type
Supports networking



WRM series risk management-type water level gauges


Installation example of ultrasonic wave gauge


Display on the cloud of Ministry of Land, Infrastructure, Transport and Tourism

The water level measurement method may be selected from among the hydraulic, ultrasonic wave, and electric wave types.

Monitoring of small and medium-sized rivers, whose flood risks have heightened due to more frequent occurrences of torrential rainfall, may be realized in a short delivery time at low cost.





Osasi Technos offers wide range of monitoring systems for disaster prevention.

Waterworks and sewerage systems

-Water level management at water purification plants
-Water level monitoring inside manholes
-Water level management at regulating reservoirs
-Water level management at irrigation channels

Slopes

-Monitoring of collapsing of slopes
-Monitoring of landslide
-Monitoring of debris flow
-Monitoring of landslide dams

Dams

-Water level management at water intake port
-Slope monitoring around dam lake (landslide)

Agriculture

-Water level management at reservoirs
-Agricultural water level management
-Irrigation management (groundwater)
-Measures against damages by birds and animals

Bridges

-Bridge monitoring
-Monitoring on cracks on steel bridges

Roads

-Flood information management
-Underpasses
-Slope management
-Safety monitoring during construction
-Hydrological survey
-Road regulation in mountain areas

Energy

-Groundwater level management at power stations
-Water channel water level management at small hydropower stations
-Safety management of solar power stations

Ports and harbors

-Tide level management (tsunami, high tide)
-Sluice management
-Floodwall gate management

Rivers

-River water level monitoring
-Sluice gate management
-Water level management at regulating reservoirs
-Water level monitoring in dam body

OSNET Network System

Measurement System

Communications through OSNET

Networks of telecommunication carriers

Specified low-power radio

Measuring instruments

[Multi-Point Inclinometer]
- ◉Data logger
  Multi-Point Inclinometer NetBC-30L
- ◉Sensor
  Multi-Point Inclinometer NetBC-30S

NetBC-30L NetBC-30S

[Water level gauge]
- ◉Ad-hoc wireless-type water level gauge
  -Ad-hoc wireless-type water level gauges NetAW-01L/NetAW-01S

NetAW-01L NetAW-01S

- ◉Data logger
  -Water level data logger NetLG-001N
  -Water level gauge with graph display WLG-01N

NetLG-001N WLG-01N

- ◉Hydraulic water level sensors
  -DS-1 (FS +/-0.1%)
  -DS-7/measurements in mm (FS +/-0.13%)
  -MS-2L (FS +/-0.25%)

DS-1

[Extensometer]
- ◉Data logger
  -Extension data logger NetLG-501
  -Extensometer with graph display SLG-100A

NetLG-501 SLG-100A

[Pipe strain gauge]
- ◉Data loggers
  -Strain and water level data loggers NetLG-301N, 301N+
  -The hydraulic water level sensor used is in common with the above water level gauges.

NetLG-301N 301N+

[Rain gauge]
- ◉Data logger
  -Rainfall data logger Net LG-201
- ◉Rainfall data transmitter -Tripping bucket rainfall data transmitter RS2

NetLG-201 RS-2

[Four-gauge strain meter]
- ◉Data loggers
  -Single-channel four-gauge strain data logger NetLG-104
  -Four-gauge strain and water level data loggers NetLG-401N, 401N+
- ◉Supported sensors (350 ohm-gauge strain sensors)
  For anchor load cells, ground clinometers, multi-stage borehole clinometers, and more

NetLG-104 NetLG-401N 401N+

[Analog ammeter/voltmeter]
- ◉Data logger
  -Single-channel analog data logger NetLG-102
- ◉Supported sensors (current and voltage output sensors)

NetLG-102

[Still camera]
- ◉Data logger
  -Image data logger NetCM-1
- ◉Camera section
  -Camera set (lenses, camera, housing, and arm)
  *Cannot be connected to wireless equipment

NetCM-1 Camera set

Wireless extension unit NetMI-3T

Used as relaying equipment

Wireless extension unit NetMI-3T

Six-port hub NetHB-1

Six-port hub NetHB-1

Six-port hub NetHB-1

Wireless extension unit NetMI-3T

Six-port hub NetHB-1

Radio waves

Wireless base unit NetMI-3T

RS232C converter NetGW-1

Semi-automatic measuring instruments

To measuring instruments

To six-port hubs

Data collection and instrument setting

To RS232C converters

Instrument settings are made and data are collected using a personal computer.

Setting and collection software OSNET Supporter 2

Network controller NetCT-1 (CF)

CF card SD card

Alarm devices

◉Alarm output device
NetAL-1

◉Alarm unit
AL-TypeC

◉LED flashlight
- AC100V LRMZL-100
- DC12V LRMZL-12

◉Electronic horn
- AC100V ST-25AM-100
- DC12V ST-25AM-12

Communication devices

◉Packet communication device
·NetMAIL-N

Internet
Ethernet converter ADSL modem/router

Optical fiber
Ethernet converter Media converter

Packet communication network

Optical fiber network

Data center

Internet

Remote observation and monitoring system

System using cloud service

Field information service

Web monitoring

Example of field information screen

Data may also be viewed on a mobile phone

Rainfall data

高知市本宮町雨量計
2015年08月26日

時間	時間	連続(mm)
00:00	0	0
01:00	0	0
02:00	2	2
03:00	1	3

Alarm e-mail

雨量計R-1
2015年08月26日
本宮地区時間雨量が警戒値を越えました。
警戒値は10mm/hです。

Example of screen on a mobile phone

System using automatic observation software OSNET OBSERVER

①System using packet communication network of au
A graph is drawn automatically based on the delivered e-mail.

Example of OBSERVER screen

Alarm e-mail

#06 SLG-100
時間移動量
警報値に達しました
設定±2.0mm/hour
測定データ
04/27 16:26
正時 +44.4mm
平均 +44.3mm
最小 +44.3mm

Alarm e-mails are sent to up to 20 destinations

②When Internet and optical fiber network are used
Data are collected at a set interval, and a graph is drawn automatically based on the delivered data.

Example of OBSERVER screen

There is also a model that converts the automatic observation data into tables and graphs and uploads them automatically to any web server. (OBSERVER-WEB version)

Products

OSNET ····· Supports networking

Water Level Gauge

Ad-hoc wireless water level gauges NetAW-01L, NetAW-01S

OSNET

Data logger

Portable terminal

Sensor terminal

Multi-point water level observation is realized with a mesh network using a specified low-power radio

■Common specifications
Frequency channel ····· 10 channels
Communication distance ····· 500 m or more when in an unobstructed view (antenna height: 3 m)
*Differs depending on the installation environment

■Data logger
Power source ····· outside power source DC12 V (5 V to 15 V)
lithium batteries CR123A (one each of main and sub batteries)
Outer dimensions ····· 165(H) x 144(W) x 95(D) (Dimensional tolerance: +/-1 mm)
Weight ····· approx. 1.0 kg
Alarm types ····· total of four upper limit and lower limit alarms (may be set for each sensor terminal)
Alarm contact output ····· one (non-voltage A or B contact)

■Sensor terminal
Power source ····· lithium batteries CR123A (two each of main and sub batteries)
compact solar power generator (optional)
Outer dimensions ····· 271(H) x 125(W) x 94(D) *Excluding protrusions (Dimensional tolerance: +/-1 mm)
Weight ····· approx. 900 g
Resolution ····· 1cm
Water level measurement precision ····· +/-0.1% F.S. (includes temperature drift in the entire operation temperature range)

*When recorded at intervals of one hour
Number of days of data accumulation: 1.2 years
Number of days of main battery operation: 2.7 months for data logger
6.7 months for sensor *When relayed in three stages

Water level data logger NetLG-001N

OSNET

Water level data logger with improved alarm function and supporting automatic observation

Power source ····· outside power source DC12 V (5 V to 15 V)
lithium batteries CR123A (one each of main and sub batteries)
Outer dimensions ····· 100(H) x 120(W) x 92(D) Weight: approx. 500 g

Compatible sensor ····· our hydraulic water level sensors
Resolution ····· 1 cm or 1 mm
Water level measurement precision ····· ±0.1%F.S.
Alarm type ····· total of four upper limit and lower limit alarms
Alarm contact output ····· one (non-voltage A or B contact)

*When recorded at intervals of one hour
Number of days of data accumulation: 6.9 years
Number of days of main battery operation: 11.2 months

Water level gauge with graph display WLG-01N

OSNET

Water level gauge with liquid crystal display and SD card slot
*Not requiring network controller NetCT-1

Power source ····· outside power source DC12 V (5 V to 15 V)
Lithium batteries CR123A (one each of main and sub batteries)
Outer dimensions ····· 165(H) x 144(W) x 100(D) Weight: approx. 1,000 g
Compatible sensor ····· Compatible sensor: our hydraulic water level sensors
Resolution ····· 1 cm or 1 mm
Measurement precision ····· +/-0.1% F.S.
Liquid crystal display ····· 128 dots in horizontal and 64 dots in vertical directions
Water level fluctuation graph, list of measurement values, current value monitoring, equipment settings, alarm settings, network settings, maintenance situations
Alarm type ····· total of four upper limit and lower limit alarms
Alarm contact output ····· one (non-voltage A or B contact)

*When recorded at intervals of one hour
Number of days of data accumulation: 6.9 years
Number of days of main battery operation: 11.2 months

Waterproof water level gauge WP-1

Dustproof and waterproof water level gauge
No storage box is needed

Power source ····· lithium batteries CR123A
(one each of main and sub batteries)
Outer dimensions ····· 141(H) x 90(W) x 62(H) Weight: approx. 350 g
Compatible sensors ····· our hydraulic water level sensors
Resolution ····· 1 mm or 1 cm
Measurement precision ····· +/-0.1% F.S.
Recording interval ····· 1 sec to 1 day
Protection class ····· equivalent to IP67

*When recorded at intervals of one hour
Number of days of data accumulation: 6.9 years
Number of days of main battery operation: 10.8 months

Hydraulic water level sensor DS-1 DS-7

■DS-1
Measurement range ····· 0 to 10 m, 0 to 20 m, 0 to 50 m, 0 to 100 m
Measurement precision ····· +/-0.1% F.S.
(non-linearity + hysteresis + reproducibility)

■DS-7
Measurement range ····· 0 to 750 mm (with 10 m-long cable)
Measurement precision ····· +/-0.13% F.S.
(non-linearity + hysteresis + reproducibility)

■Common specifications
Material of the sensor ····· SUS316L
Outer dimensions ····· ø25x127 mm Weight: 120 g

*Water level sensors with output of 4 to 20 mA are also available.
Please feel free to contact our sales personnel for details.

Hydraulic water level sensor MS-2L

■MS-2L
Measurement range ····· 0 to 10 m, 0 to 20 m, 0 to 50 m
Measurement precision ····· +/-0.25% F.S.
(non-linearity + hysteresis + reproducibility)
Material of the sensor ····· SUS316L
Outer dimensions ····· ø25x120 mm Weight: 140 g

Hydraulic water level sensor PDCR-1830

■PDCR-1830
Measurement range ····· 0 to 10 m, 0 to 20 m, 0 to 50 m
Measurement precision ····· +/-0.1% F.S. (non-linearity + hysteresis + reproducibility)
Material of the sensor ····· titanium
Outer dimensions ····· ø17.5x105 mm Weight: 100 g

*Lightning arrester is available as an option

Cable bracket

Material ····· polyvinyl chloride
Inner diameter ····· ø75 and more

*For fixing our hydraulic water level sensors

Extensometer

Extensometer data logger NetLG-501

OSNET

High-performance extensometer with built-in network communication port

Measurement range ····· +/-3,276.7 mm (the liquid crystal display range on the main body is +/-1,999.9 mm)
Resolution ····· 0.1 mm
Drawn-out wire length ····· 1 m
Recording interval ····· double recording every 1 min and every 5 min to 1 day
Recorded values ····· every hour on the hour, average value, minimum value, maximum value
Alarm type ····· hourly displacement, daily displacement, displacement with time x 4
Alarm contact output ····· one (non-voltage A or B contact)

Power source ····· outside power source DC12 V (5 V to 15 V)
lithium batteries CR123A (one each of main and sub batteries)
Outer dimensions ····· 148(H) x 180(W) x 208(D) Weight: approx. 2.6 kg

*When recorded at intervals of one hour
Number of days of data accumulation: 10.4 months
Number of days of main battery operation: 3.8 months

Extensometer with graph display SLG-100A

OSNET

Extensometer capable of displaying graphs of chronological data at site
*Data collection is possible with SD card

Measurement range ····· 0 to 1,000 mm
Resolution ····· 0.1 mm
Drawn-out wire length ····· approx. 1.2 m
Recording interval ····· double recording every minute and every hour
Recorded values ····· value at every hour on the hour, average value, minimum value, maximum value
Alarm type ····· hourly displacement, daily displacement, total displacement, displacement with time
Alarm contact output ····· one (non-voltage A or B contact)

Liquid crystal display ····· number of displayed dots: 128 in horizontal x 64 in vertical directions
Displayed data ····· total displacement graphs (weekly, daily, hourly); list of measurement values (daily, hourly); alarm setting values; monitored current values; equipment settings; alarm settings; and alarm history
Power source ····· lithium batteries CR123A (one each of main and sub batteries)
Outer dimensions ····· 130(H) x 130(W) x 216(D) Weight: approx. 1.7 kg

*When recorded at intervals of one hour
Number of days of data accumulation: 10.4 months
Number of days of main battery operation: 3.5 months

Visual underground extensometer MTS-10

Multi-layer displacement gauge for determining the depth of underground slip plane and detecting displacement on the slip plane

Number of measurements ····· up to 10
Measurement range ····· 300 mm
Outer dimensions ····· 486(H) x 566(W) x 85(D)
Weight: approx. 9 kg

Super invar wire

Size: 30 m coil or 100 m coil ø0.5 mm
Thermal expansion coefficient: 0.5 x 10-6/℃ (30 to 100℃)
Urethane-coated

Container for extensometers

Material: wood
Dimensions: 267(H) x 285(W) x 425(D)

Strain and Water Level Gauge

Strain and waterlevel data logger NetLG-301N

OSNET

Supports OSNET and extension
Data collection is possible using SD card

■General specifications
Power source ····· outside power source DC12 V (5 V to 15 V)
lithium batteries CR123A
(one each of main and sub batteries)
Alarm contact output ····· one (non-voltage A or B contact)

■Water level sensor specifications
Compatible sensors ····· our hydraulic water level sensors
Resolution ····· 1 cm or 1 mm
Measurement precision ····· +/-0.1%F.S.
Alarm type ····· total of four upper limit and lower limit alarms

■Strain sensor specifications
Compatible sensor ····· two-gauge three-wire 120-ohm strain gauge sensor
Sensor power source ····· constant DC5.00 mA +/-0.4%
Resolution ····· 1μ strain
Measurement precision ····· within +/- 100μ strain
Alarm type ····· total of four cumulative displacement alarms and chronological displacement alarms

*When recording interval is one day for strain and one hour for water level
Number of days of data accumulation: 17.2 years for strain, 3.4 years for water level
Number of days of operation of main battery: 10 months

Outer dimensions ····· 223(H) x 355(W) x 90.5(D)
Weight ····· approx. 2.5 kg
Number of channels ····· one for water level, 30 for strain

Extension unit 301N+

OSNET

Outer dimensions ····· 223(H) x 95(W) x 82.5(D)
Weight ····· approx. 0.9 kg
Number of channels ····· 10 for strain

*Up to six extension units may be connected.

Pipe strain gauge VP40/50

VP40 ····· one-direction two-gauge (with a sleeve of outer diameter of 48ø)
VP40 ····· two-direction four-gauge (with a sleeve of outer diameter of 48ø)
VP50 ····· one-direction two-gauge (with a sleeve of outer diameter of 60ø)

*Used by connecting with NetLG-301N, portable strain gauges, and other types of data loggers for pipe strain measurement.

Products

OSNET ····· Supports networking

Multi-point ground-level clinometer

NETIS registration No: SK-160012-A

Multi-Point Inclinometer NetBC-30L, NetBC-30S

OSNET

Data logger

Sensor (radio section)

Sensor (detection section)

Solar power source unit (optional)

External antenna (optional)

Multi-Point Inclinometer that planarly captures disturbances on a slope
Equipped with mesh-type radio transmitter with which communication is hardly interrupted

■Data logger specifications
Power source ····· outside power source DC12 V (5 V to 15 V)
Lithium batteries CR123A (one each of main and sub batteries)
Outer dimensions ····· Body part: 158.5(H) x 144(W) x 120(D) (without antenna)
Weight ····· approx. 1 kg
Container: 416(H) x 275(W) x 160(D) Weight: approx. 2 kg
Alarm types ····· alarms on cumulative and chronological composite inclination angles
Alarm contact output ····· one (no-voltage A or B contact)
■Sensor specifications
Power source ····· lithium batteries (two each of main and sub batteries)
compact solar power generator (optional)
Outer dimensions ····· radio section: 411(H) x 125(W) x 102(D) (including rear panel)
Weight: approx. 1.3 kg
Detection section: 55(H) x 90(W) x 30(D) Weight: approx. 500 g
Resolution ····· 0.01°
Measurement precision ····· within +/-0.2°
■Radio specifications
Frequency channels ····· 10 (920 MHz band)
Communication distance ····· 400 m or more when in an unobstructed view
100 m or more in woods

*When recorded at intervals of one hour
Number of days of data accumulation: 1.2 years
Number of days of main battery operation: 2.6 months for data loggers; 6.4 months for sensors

Load and Inclination Gauge

Four-gauge strain and water level data logger NetLG-401N

OSNET

Supports OSNET and extension
Data collection is possible using SD card

■General specifications
Power sources ····· Outside power source DC12 V (5 V to 15 V)
Lithium batteries CR123A (one each of main and sub batteries)
■Water level sensor specifications
Compatible sensors ····· our hydraulic water level sensors
Resolution ····· 1 cm or 1 mm
Measurement precision ····· +/-0.1% F.S.
■Strain sensor specifications
Compatible sensors ····· four-gauge 350-ohm strain gauge-type converters
Sensor power source ····· constant DC5.00 mA +/- 0.4%
Resolution ····· 1μ strain
Measurement precision ····· within +/-100μ strain
■Thermocouple specifications
Compatible sensors ····· K-, N-, J-, T-types
Resolution ····· 0.1°C
Measurement precision ····· within +/-0.7°C +/- 2°C (internal contact compensation)
+/-0.7°C (external contact compensation)

*When recorded at intervals of one hour
Number of days of data accumulation: 1.4 years for four-gauge strain, 3.4 years for water level
Number of days of main battery operation: 6.1 months

Outer dimensions ····· 261(H) x 189(W) x 90.5(D)
Weight ····· approx. 1.6 kg
Number of channels ····· one for water level, 10 for strain

Extension unit 401N+

Outer dimensions ····· 261(H) x 95(W) x 81(D)
Weight ····· approx. 1 kg
Number of channels ····· 10 for strain

*Up to five extension units may be connected.

Four-gauge strain data logger NetLG-104

OSNET

Single-channel strain data logger with built-in network communication port

Sensor power source ····· DC2.00 V
Measurement range ····· +/-15,000μ strain
Resolution ····· 1μ strain
Measurement precision ····· +/-0.04%F.S.
Alarm types ····· total of four upper limit and lower limit alarms
Alarm contact output ····· one (no-voltage A or B contact)

Compatible sensors ····· four-gauge 350-ohm strain gauge-type converters
Power source ····· outside power source DC12 V (5 V to 15 V)
lithium batteries CR123A (one each of main and sub batteries)
Outer dimensions ····· 100(H) x 120(W) x 62(D) Weight: approx. 500 g

*When recorded at intervals of one hour
Number of days of data accumulation: 5.7 years
Number of days of main battery operation:
9 months (with the settings at the time of factory shipment)

●Supported sensors (350 ohm-gauge strain sensors)
For anchor load cells, ground clinometers, multi-stage borehole clinometers, etc.

Rain Gauge

Rainfall data logger NetLG-201

OSNET

Rain gauge with built-in network communication port

Input signal ····· 0.5 mm or 1 mm/pulse (no-voltage contact)
Recording period ····· up to 7,620 mm of cumulative rainfall
Alarm types ····· hourly rainfall, daily rainfall, continuous rainfall,
effective rainfall, chronological rainfall
Alarm contact output ····· one (no-voltage A or B contact)

Compatible sensor ····· tipping-bucket rainfall transmitter
Power sources ····· outside power source DC12 V (5 V to 15 V)
lithium batteries CR123A (one each of main and sub batteries)
Outer dimensions ····· 100(H) x 120(W) x 60.9(D) Weight: approx. 500 g

*When recorded at intervals of one hour
Greatest value of cumulative rainfall: 7,620 mm
Number of days of main battery operation: 11.7 months
(when the average monthly rainfall is 500 mm)

Tipping-bucket rainfall transmitter RS-2

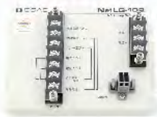
Sensor that outputs a rainfall pulse signal each time a rainfall of 0.5 mm is reached

Detection method ····· tipping-bucket
Measurement unit ····· 0.5 mm/tipping (pulse)
Output signal ····· no-voltage make contact output
(main and sub contacts)
Precision ····· within +/-0.5 mm when the rainfall is 20 mm or less
Within +/-3% when the rainfall is more than 20 mm
Materials Outer cylinder ····· SUS304 Drainage cylinder and filter: resin
Tipping bucket: brass-plated
Inlet diameter ····· 200 mm
Outer dimensions ····· approx. ø210 x 450 mm

Analog Gauge

Single-channel analog data logger NetLG-102

OSNET



Analog data logger with built-in network communication port

Sensor power source ····· selectable from among insulated DC12 V, insulated DC24 V,
and outside power source through-output
(ON/OFF control available)
Measurement range ····· 4 to 20 mA, 0 to 1 V, 0 to 5 V, 0 to 10 mV
Measurement precision ····· +/-0.1% F.S. (+/-0.2% F.S. for the 0 to 10mV range)
Sensor pre-heating time ····· 0 to 60 sec
Average data time ····· 0 to 10 min
Recording interval ····· 1 sec to 1 day
Alarm types ····· total of four upper limit, lower limit,
Power source ····· chronological fluctuation alarms
Outer dimensions ····· outside power source DC10 V to 15 V
113(H) x 164(W) x 61(D) Weight: approx. 600 g

*When recorded at intervals of one hour
The number of days of data accumulation: 6.9 years

●Connectible sensors: current/voltage output sensors

Communication Equipment

Packet communication device NetMAIL-N

OSNET

NetMAIL-N

NetMAIL-NBOX-S
*Power source equipment set for NetMAIL-N

*Stainless steel box
(with built-in 17AH battery)

Distributes the data and alarms in OSNET devices via e-mails through NTT's packet communication network

Power source voltage ····· outside power source DC10 V to 15 V
Current consumption ····· up to 20 mA (when standing-by for reception)
160 mA (when emitting radio waves) (Depending on the conditions)
Outer dimensions ····· 55(W) x 207(H) x 110(D) mm (excluding protrusions)
Usage temperature range ····· -20℃ to +55℃ (No dew condensation should develop)
Observation interval ····· 5 min to 1 day (may be set in two patterns)

Compatible services ····· NTTDoCoMo3G (FOMA) or LTE (Xi)
Usage frequency ····· 800 MHz band/2.1 GHz band
Communication speed ····· up to 5 Mbps (outgoing)/up to 10 Mbps (incoming)
Compatible standards ····· conforming to the ARIB STD-T53
Input contacts ····· nine; input current: approx. 1.3 mA
Output contacts ····· four; output capacity: DC60 V/200 mA

Antenna specifications ····· outer dimension (height): 323 mm

Network wireless equipment NetMI-3T

OSNET

OSNET network equipment utilizing specified low-power radio

■General specifications
Power source ····· outside power source DC12 V (5 V to 15 V)
lithium batteries CR123A (two each of main and sub batteries)
when emitting radio waves: 20 mA or less (when operated by outside power source);
Current consumption ····· 35 mA or less (when operated by lithium batteries)
When standing-by for reception: 200 μA or less

■Radio section specifications
Outer dimensions ····· ø95 x 382(H) (excluding protrusions) Weight: approx. 850 g
Frequency channels ····· two channels (429 MHz band)
Communication distance ····· 1,000 m or more (in an unobstructed view)
100 m or more (in woods)
Number of relaying stages ····· up to 22

■Operation section specifications
Outer dimensions ····· 125(W) x 162(H) x 62.8(D) Weight: approx. 630 g
Alarm contact output ····· one (no-voltage A or B contact)

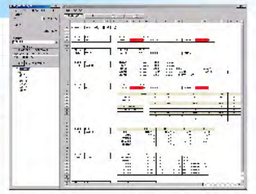
Software

■Automatic observation software OSNET OBSERVER OSNET

The software is for making automatic observations with OSNET network devices, from a remote location. Automatic observations are made at set observation intervals (5 min to 1 day), and graphs of the observation data may be viewed on personal computers.

■Automatic observation software OSNET OBSERVER Web-version OSNET

The software is for creating a website page showing tables and graphs of data collected by OSNET OBSERVER, and uploading the page to any server. The latest situations at the site may be confirmed on the Internet environment, from any location.



Latest measurement value screen of OBSERVER

■Setting assistance software OSNET Supporter 2 OSNET

The software enables, from a remote location, display of a tree form of OSNET network devices, detection of address duplication, loop connection and other network disturbances, confirmation and changing of equipment settings, displaying of data (recording data and alarm issuance situations), recorded data collection (Logger.dat), and other tasks.

■Data processing software D-Station

The software is for creating forms by loading the logger data collected using a CF card or other media and creating diagrams, tables, etc. It may be used in combination with the automatic observation software.

■Rainfall data processing software R-Station

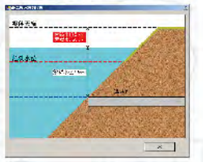
The software is for creating forms by loading the rainfall logger data collected using a CF card or other media and creating diagrams, tables, etc.

■WISEF-supporting data processing software W-Station

The software is for loading the water level logger data collected using a CF card or other media, creating forms, and outputting text files of WISEF format.

■Reservoir water level prediction system OSNET DAM-HAZARD to be used at times of torrential rainfall

The system predicts the reservoir water level at a time of torrential rainfall, by inputting the specifications/parameters of the reservoir and hyetographs (the chronological rainfall data). The software may also be used by connecting to the Internet and automatically downloading the predicted rainfall data of the Meteorological Agency, for predicting the rise in reservoir water level from the present time to up to six hours in the future.
*The software has been developed through joint research and development with the Institute for Rural Engineering, National Agriculture and Food Research Organization.



■Automatic water level and rainfall observation software D-COLLECT OSNET

The software is for acquiring the water level gauge and rain gauge data in the OSNET network at the site using the packet communication device NetMail-1 and NetMail-2, enabling automatic data collection from a remote location.
*The software may be linked with DAM-HAZARD when the real-time analysis function is activated, for enhancing the precision of reservoir water level prediction.

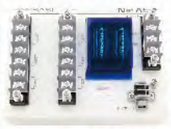
Products

OSNET ····· Supports networking

Alarm Device

Alarm output device NetAL-1

OSNET



Outputs an alarm when an alarm signal is received Monitors network disturbances such as cable disconnection

Power source	lithium batteries CR123A (one each of main and sub batteries)
Outer dimensions	113(H) x 164(W) x 60.3(D) Weight: approx. 700 g
Applications	Applications: vigilance and evacuation warning output at site, warning output to remote locations, notification on network disturbances one OSNET-compatible port
Communications port	six (no-voltage A or B contact)
Alarm contact output	DC30 V/500 mA (maximum); AC100 V/150 mA (maximum)
Alarm contact capacity	Outside power source DC12 V (5 V to 15 V)

Alarm unit AL-TypeC

Setting ON/OFF of alarm devices and alarm output timing

*Equipped with two alarm output channels

Power source	AC100 V (connected to terminal base) or DC12 V
Outer dimensions	165(H) x 180(W) x 75(D) (including protrusions)
Alarm output timing	OFF, 30 sec, 1 min, 2 min, 5 min, 10 min, 30 min, 1 hour, 6 hours, continuous
Alarm contact input	two (no-voltage A or B contacts)
Alarm contact output	two (AC100 V), two (DC12 V, two outputs interlocked with timer, or continuous), one (relay output contact, no-voltage A or B contact)
Output capacity	10 A under resistance load, 5 A under inductive load

Installation on a tripod

LED flashlight

[With AC power source]

Rated power source voltage	AC100 V
Operating voltage range	90 to 110 V
Rush current	0.4 A
Power consumption	12 W

[With DC power source]

Rated power source voltage	DC12 V
Operating voltage range	10 to 15 V
Rush current	2.5 A
Power consumption	6 W

Electronic horn

[With AC power source]

Rated voltage	AC110 V/220 V (switchable)
Operating voltage range	90 to 120 V 180 to 220 V
Power consumption	11 W
Sound pressure level	105 dB (at 1 m in front)

[With DC power source]

Rated voltage	DC12 V/24 V (switchable)
Operating voltage range	10 to 15 V/19 to 29 V
Power consumption	3 W/8.5 W
Noise pressure level	105 dB (at 1 m in front)

Motor siren

Rated voltage	AC100 V
Capacity	100 W
Power consumption	95 W

Wire sensor

For detecting falling rocks and debris flow Used by connecting to alarm devices

Size	1.2 x 0.8 x 1P
Color	light blue
Conductor resistance	38 ohm/km (20℃)
Length	200 m/roll
Weight	approx. 8.6 kg

Tripod

Tripod for LED flashlight

Model	SZ-009
Pitch for fitting the flashlight	120 to 140
Size	approx. 1,113 mm in total length
Height adjustment range	1,295 mm to 2,285 mm
Surface treatment	electrodeposition (black)
Weight	4.5 kg

Tripod adapter

Adapter for fitting an electronic horn and other equipment on the tripod for LED flashlight

Size	120(H) x 120(W) x 190(D)
Pipe inner diameter	ø27.6
Material	SS400 steel (coated in dark brown)
Applications	installing a motor siren or an electronic horn

OSNET is a registered trademark of Osasi Technos Inc.

OSNET Low Power & Flexible Network System

OSNET is the generic name for the network based on the specifications of Osasi Technos. OSNET enables formation of a network by connecting up to 64 units of devices with a distance between them of up to 1 km (with a single-wire twisted pair cable of 0.9 mm or larger). The most distinguished feature is the use of lithium batteries that enable the network to be used in mountains and other areas where power sources are not available. With additional devices, OSNET also enables data collection from remote locations and output of alarms.

Camera

OSNET camera (Image data logger and NetCM-1 camera)

OSNET

■General specifications

Rated voltage	outside power source DC10 V to 15 V
Power consumption	1.5 mA (average; when standing-by); 250 mA or less (when photographing)
Usage temperature range	-20℃ to +55℃ (No dew condensation should develop)

■Control section specifications

Photographed image size	VGA (640x480)
Photographing interval	5 min to 12 hours
Photographing functions	interval and event photographing
Contact input	two (no-voltage A or B contacts)
Contact output	two (no-voltage A contacts)
Outer dimensions	80(W) x 188(H) x 135.2(D) mm Weight: approx. 820 g
Accessory	one industrial-use SD card (capacity: 2 GB)

■Camera section specifications

Number of pixels	410,000 (with night vision function)
Zoom	optical 11 times magnification zoom
Start-up time when photographing	up to 15 sec
Waterproof performance	IP66 waterproof housing
Weight	approx. 6 kg (including housing)

Peripheral Equipment

Six-port hub NetHB-1

OSNET

Switching hub with six built-in communications ports

Applications	communication between network devices, expansion of OSNET network, data relay, cable extension
Communications port	six OSNET ports
Power source	outside power source DC12 V (5 V to 15 V) lithium batteries CR123A (one each of main and sub batteries)
Outer dimensions	123(H) x 174(W) x 60.9(D) Weight: approx. 800 g

RS-232C converter NetGW-1

OSNET

Outside devices may be connected to the network via RS-233C

Applications	data collection on PC, remote control, centralized management system, etc.
Communications port	one OSNET port
RS-232C	conforming to the RS-232C standards
Power source	outside power source DC12 V (5 V to 15 V)
Outer dimensions	100(H) x 120(W) x 60.9(D) Weight: approx. 450 g

Network controller NetCT-1 (CF)

OSNET

Settings and data collection for OSNET devices

Applications	data collection by CF card, setting and data confirmation on OSNET devices, network set-up
Communications port	one OSNET port
Power source	one lithium battery CR123A
Operation temperature range	-10℃ to +55℃ (no dew condensation should develop)
Outer dimensions	92(H) x 135(W) x 29(D) Weight: approx. 500 g

Lightning arrester for power sources and communication lines NetSP-1

OSNET

Protects network devices from lightning surges

Supported circuit	communications port (x1) DC12 V power source (x1)
Surge tolerance	7,000 A (8/20 μs)
Outer dimensions	102(H) x 78(W) x 64.3(D) Weight: approx. 370 g

Lightning arrester for communication lines NetSP-2

OSNET

Protects network devices from lightning surges

Supported circuit	communications port (x2)
Surge tolerance	7,000 A (8/20 μs)
Outer dimensions	102(H) x 78(W) x 64.3(D) Weight: approx. 370 g

Solar cell panel

Power source for driving network devices

Output	10 W, 20 W, 30 W, 50 W
Panel adjustment angles	0℃, 20℃, 40℃, 60℃
Solar cell element	polycrystalline silicon cell
Bracket	for single pipe or pole SUS304 (The single-pipe clamp is made of SS, plated and coated)
Cable length	5 m

Plastic boxes

Protective box for network devices

Material	AAS resin
Color	whitish grey
Bracket	for single-pipe or pole

*Available in various sizes

SD card

Highly reliable and durable industrial model to be used in a wide temperature range between -40℃ and +85℃

Interface	conforming to the SD memory card specifications Ver.3.0
Memory capacity	2 GB
Memory type	SLC
Outer dimensions	24.0(W) x 32.0(H) x 2.1(D)
Operation temperature range	-40℃ to +85℃ (no dew condensation should develop)

CF card

Highly reliable and durable industrial model to be used in a wide temperature range between -20℃ and +55℃

Interface	conforming to the CFA3.0 specifications
Memory capacity	256 MB
Memory type	SLC
Outer dimensions	42.8(W) x 36.4(L) x 3.3(T) (CF card of Type I form)
Operation temperature range	-20℃ to +55℃ (no dew condensation should develop)

Transducer for water level gauge

Transducer for hydraulic water level gauge PMC-90

Data are displayed on the screen and transmitted to external devices

Number of input channels	one or two
Compatible sensor	hydraulic water level sensor
Sensor input range	+/-75 mV (voltage input type) DC4 to 20 mA (current input type)
Sensor power source output voltage	DC3.75 V +/-0.1 V (voltage input type) DC24 V +/-1.2 V (current input type)
Water level display resolution	1 cm or 1 mm
Measurement precision	+/-0.1%F.S.
Display	character LCD, 20 digits x 2 rows
Smoothing	automatic smoothing by a digital low-pass filter or the moving average
Recording interval	1 sec to 1 day
Output specifications	1 or 2 quantities (BCD or 4 to 20 mA)
Output update interval	1 sec or when an external start contact is made
Power source	outside power source DC12 V (10 V to 15 V) *AC100 V available as an optional outside power source
Outer dimensions	480(W) x 320(D) x 99(H) *Excluding protrusions Weight: approx. 4.5 kg

Rental

OSNET ····· Supports networking

Osasi Technos offers rental services of some of the products, which may be used conveniently to suit your needs such as making observations for a short period. The service may reduce management burdens and costs.

Water Level Gauge

Water level data logger NetLG-001
OSNET

Water level gauge with graph display WLG-01N
OSNET

Water Level Sensor

Hydraulic water level sensor DS-1 (in cm) DS-7 (in mm)

Multi-point ground-level clinometer

NETIS registration No: SK-160012-A

Multi-Point Inclinometer NetBC-30L・NetBC-30S
OSNET

Data logger

Sensor (radio section)

Sensor (detector section)

Strain and Water Level Gauge

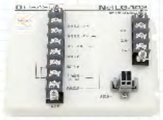
Strain and water level data logger NetLG-301
OSNET

Strain and water level data logger NetLG-301N
OSNET

Extension unit 301N+
OSNET

Analog Gauge

Single-channel analog data logger NetLG-102
OSNET



Communication Equipment

Packet communication device NetMAIL-2
OSNET

NetMAIL-2

NetMAIL-2BOX
*Power source set for NetMAIL-2BOX

*Steel plate construction (with built-in 17AH battery)

Wireless parent unit NetMI-P
OSNET

Wireless child unit NetMI-C
OSNET

Extensometer

Extension data logger NetLG-501
OSNET

Extensometer with graph display SLG-100
OSNET

Load and Inclination Gauge

Four-gauge strain data logger NetLG-401
OSNET

Peripheral Equipment

Six-port hub NetHB-1
OSNET

RS-232C converter NetGW-1
OSNET

Network controller NetCT-1
OSNET

CF card set

SD card

Rain Gauge

Rainfall data logger NetLG-201
OSNET

Tipping-bucket rainfall transmitter RS-2, RS-1

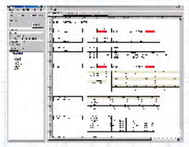
Alarm Device

Alarm output device NetAL-1
OSNET

Safety system for preventing workplace accidents
NetLG-201, RS-1 (or RS-2), NetCT-1 and CF card set

Software

Automatic observation software OSNET OBSERVER
OSNET



Camera

OSNET camera (Image data logger, NetCM-1 camera)
OSNET

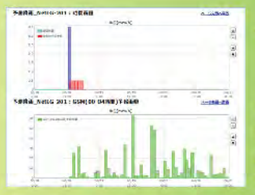
Osasi Technos' cloud service

Field Information Service

Our Field Information Service enables the observation data of devices installed at the site to be viewed at any time via the Internet on the client's PC and mobile equipment.
We offer a highly flexible service that proves effective not only for routine observations, but also for observation organizations to deal with emergency disaster situations.

Observation data

Function to make the predicted rainfall visible



*Data provided by Meteorological Agency are displayed as the predicted rainfall.

Alarm e-mail

Internet

Internet

Osasi Technos

Cloud

Data transmission

Exploration

Groundwater level

Rainfall

Inclination

Natural disasters

Landslide

Debris flow

Rockfall

Maintenance and management

Slope maintenance and management

Reservoir water level management

Bridge maintenance and management

Advanced Disaster Prevention

Tide level monitoring

Flood monitoring

River monitoring

OSNET network secures the observation data of devices at the site for certain and transmits them to remote locations, even in the severe outdoor environment.

Features of the service

◉Observation can be started with a short lead time

The service is available once the observation devices are installed at the site. You can start observations in a short period of time (3 days to one week) even at a time of emergency disaster.

◉Observation and monitoring are possible at your office and while you are out

The data and chronological graphs may be confirmed at any time and any place, if the Internet environment and a PC or a mobile device are at your hand.

●Function is also available to make the predicted rainfall visible

Predicted rainfall may also be shown as a graph, in addition to the observation values of devices at the site. Also, the predicted rainfall data may be downloaded from the website.

◉The system may be introduced with a small burden

Clients may introduce the system at a small burden, because no server management or exclusive software is needed.

◉Alarms are sent on a real-time basis

Since the alarm function and automatic observation function are independent of each other, alarms may be issued right away regardless of the automatic observation interval.

Only the information that you want to show or see is displayed

Screen composition

Two separate screens are available, one each for the administrator's side and the viewer's side. The administrator not only can register a plurality of viewers for each site, but also can make settings that fit the needs of each viewer.

Administrator's side

On-site management website

The administrator configures the site information and allocates privileges to individual user IDs.

User's side

User website

Mobile phone website

Users log-in using the user ID and password to which privileges have been allocated, for viewing the data.

Web-based Measurement System

The observation unit/data logger is equipped with a web server and a built-in Ethernet interface, enabling real-time monitoring on an Internet browser at a remote location.

- Low cost web-based monitoring
- Real-time alarm monitoring

Web-based water level gauge ITC-01, 02

Water level monitoring screen

The water level gauge has two sets of observation intervals (1 sec to 1 hour) and smoothing frequency, for normal times and emergency times. The observation interval and smoothing frequency may be varied continuously, in accordance with the issuance/cancellation of alarms in five alert levels.

Number of input channels	one for water level
Supported sensor	DS-1 and other hydraulic water level sensors (0 to 40 mV) of Osasi Technos for ITC-01 Current/voltage output sensors of 4 to 20 mA, 0 to 5 V, 0 to 1 V for ITC-02
Sensor power source	4 V (compatible with DS-1 and others) for ITC-01 Selectable from among 24 V, 12 V and thru power source for ITC-02
Measurement precision	within +/-0.1% F.S. (including temperature drift in the entire operation temperature range)
Power consumption	1 W (at normal times and when taking measurements) for ITC-1 1 W (at normal times) and 2 W (when taking measurements; variable depending on the sensor connected) for ITC-2

Web-based rain gauge ITC-21

Rainfall monitoring screen

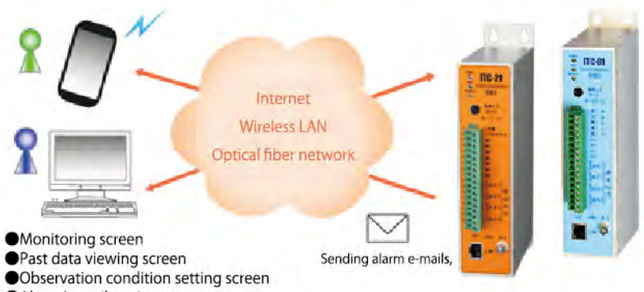
The rain gauge calculates and stores the hourly rainfall, daily rainfall, continuous rainfall, N-hour rainfall (10 min to 3 days), and effective rainfall, every minute. According to the five alert levels, the rain gauge conducts real-time monitoring and issues alarms.

Input signal	0.5 mm or 1 mm/pulse (no-voltage contact)
Power consumption	1 W (at normal times and when making measurements)

Common specifications of ITC devices

Alert settings	five levels
Alarm contact output	four contacts
E-mail transmission	12 alarm e-mails, two observation e-mails
Operation temperature range	-20℃ to +55℃ (no dew condensation should develop)
Measures against instantaneous power failure	the back-up capacitor saves the data stored on devices and prevents damages, even at a time of instantaneous power failure. (Measurements are cancelled during power outage.)
Outer dimensions	50(W) mm x 216(H) mm x 145(D) mm
Weight: approx	approx. 860 g
Power source voltage	DC12 V (10.5 to 15 V)

The system may be connected to the existing LAN infrastructures including optical cables and wireless LAN, without the need for a special data center, for sharing, viewing, and using information on the network. The costs for system introduction and operation may be reduced.



- Monitoring screen
- Past data viewing screen
- Observation condition setting screen
- Alarm/e-mail setting screen

*Communication equipment (router) is necessary for connecting to the Internet.

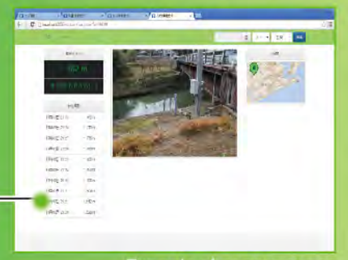
Disaster prevention solution by Osasi Technos

Simple server system 「Local Disaster Prevention」

Network camera capturing the ongoing situations at remote locations

Image monitoring

The river water level and surrounding conditions are monitored based not only on data but also on images. Integrated monitoring is possible by combining water level and rainfall gauges. Visual monitoring may be conducted during daytime based on images, and numeric monitoring during nighttime using the observation data. At times of disaster, the camera may be remote-operated for monitoring the conditions that keep on changing every moment.



Example of camera screen

Integrated ITC server

Disaster prevention monitoring on localized torrential downpour

Rainfall monitoring

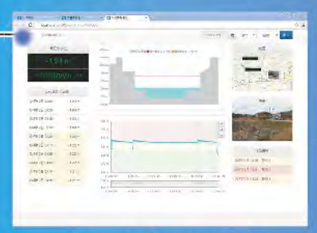
With built-in ITC-21

Example of rainfall screen

By combining observation and communication devices in one box, installation at the site and relocation are facilitated and web-based remote monitoring may be started on the day of installation.
The system is equipped with the alarm notification function utilizing e-mails and contacts, as a standard. Observation and alert monitoring are conducted every minute at all times, enabling real-time monitoring and studies on issuance of evacuation instructions at an early stage.

Disaster prevention monitoring of rivers, tsunami, flooding, and inundation

Water level monitoring



Example of water level screen

With built-in ITC-01, 02

The water level observation devices may be operated in alert mode, which is our unique function. When the set alarm standard value has been reached, the system automatically shortens the observation and disaster monitoring intervals (to 1 sec at the shortest), for monitoring of signs of disasters.
The detailed data obtained in the alert mode may be utilized for formulating future disaster prevention measures.

Company Profile

Management philosophy

Osasi Technos is determined to contribute toward society through company-wide efforts to enhance customer satisfaction by constantly offering the market with high-quality products and services that are satisfactory and credible to customers.

Company outline

Name / Osasi Technos Inc.
Address / 65-3 Motomiya-cho, Kochi City, Kochi, Japan
Offices / Head office (Kochi City)
Tokyo Main Office
Kyushu Branch
Established on / June 10, 1972
Capital / 350 million yen
Representative / Maki Yano, Representative Director
Scope of business / Design, development, manufacture, and sale of measuring instruments, rental and cloud services, installation and maintenance services
Main banks / Shikoku Bank, Shoko Chukin Bank

Brief history

1972 Osasi Products was established.

1977 The capital was increased from 3 million yen to 7 million yen.

1978 Approved as a general constructor by the Governor of Kochi Prefecture.

1985 Developed a memory card-type data logger under guidance by Civil Engineering Laboratory of Ministry of Construction.

1988 The memory card-type data logger was given a Local Industry Award of Kochi Prefecture.

1992 The capital was increased from 7 million yen to 10 million yen.

1993 The company name was changed to Osasi Technos Inc.

1994 Tokyo Main Office was established.
The data logger/transmitter for road traffic congestion was given a Local Industry Encouragement Award of Kochi Prefecture.

1997 The capital was increased from 10 million yen to 35 million yen.

1998 The automatic landslide monitoring system for emergency was granted a technical review certificate of Sabo & Landslide Technical Center, an institute accredited by the Construction Minister.

The new head office building (Kochi City) was completed.

1999 Kyushu Branch was established.
Representative Director Osashi Yano received an Industrial Technology Award for Distinguished Service of Kochi Prefecture.

2000 Safety System for Preventing Industrial Accidents Caused by debris flow was given a Local Industry Encouragement Award of Kochi Prefecture.
Started rental services of the company's products.

2002 Approved as a general constructor by the Minister of Land, Infrastructure, Transport and Tourism.
Released the OSNET network series.

2003 President and Representative Director Osashi Yano assumed the office of Chairman and Representative Director.
Senior Executive Director Toshitaka Nozaki assumed the office of President and Director.
Released the industry's first extensometer with graph display.

2005 Released water level gauges with graph display.
President and Director Toshitaka Nozaki assumed the office of President and Representative Director.

2007 Released OSNET radio set (patented in 2012).

2008 Released OSNET packet communication device.

2009 Released waterproof water level gauges.
OSNET packet communication devices were given a Local Industry Encouragement Award of Kochi Prefecture.
OSNET packet communication devices were given an Encouragement Award of MCPC Award 2009.

2010 Immediately Deployable Automatic Monitoring System was registered with the New Technology Information System (NETIS) of the Ministry of Land, Infrastructure, Transport and Tourism.
Released single-channel analog data loggers.

2011 Released single-channel four-gauge strain data loggers.
Renewed the extensometers with graph display.
Started Field Information Service, an ASP service compatible with KDDI and NTT DoCoMo.
Released OSNET cameras.

2012 Field Information Service started supporting satellite mobile phones of NTT DoCoMo.
The extensometers with graph display and Field Information Service were certified as registered disaster prevention products of Kochi Prefecture.

2013 President and Representative Director Toshitaka Nozaki resigned upon expiration of the term of his office.
Executive Director Maki Yano assumed the office of President and Director.
Released web-based water level gauges (patented in 2013).
The web-based water level gauges and OSNET radio set were certified as registered disaster prevention products of Kochi Prefecture.

2014 Released web-based rain gauges
The web-based water level gauges were given the Local Industry Award of Kochi Prefecture.
The web-based rain gauges were certified as registered disaster prevention products of Kochi Prefecture.

2015 Released Multi-Point Inclinometer that planarly capture displacement of slopes.

2016 Multi-Point Inclinometer were registered with NETIS.
Multi-Point Inclinometer were certified as registered disaster prevention products of Kochi Prefecture.
Osasi Technos was listed by the Small and Medium Enterprise Agency among the 300 Wing-Spreading Small and Medium Enterprises and Small Business Operators.
Released ad-hoc wireless water level gauges.

2017 Chairman and Representative Director Osashi Yano took the office of Chairman and Director.
President and Director Maki Yano took the office of President and Representative Director.
Patent was obtained (for measuring instrument management system and program based on AR technologies) through joint application with the Kochi Prefectural government.

Scope of business

Design and development

Design and development divisions design, develop, and improve our products. All the works for assembled hardware development, assembled software development, and Windows software development have been conducted in-house. Efforts are being made for improving the quality of our products and enhancing customers' confidence on them even further, at the same time responding to various requests from our customers.

Manufacture

Manufacturing divisions place emphasis on quality of our products, and have implemented stringent quality control throughout the manufacturing processes. Various types of test machines are being used, including image inspection apparatuses and automatic pressurizers. Efforts are being given for quality improvement daily, based on thorough testing and inspection systems used in each manufacturing process.

Installation and maintenance

"We pass on voices of the earth" - the slogan is particularly symbolic for installation and maintenance divisions. Our systems are always installed, built, and maintained in a way optimum for the actual situations at the site. Through the comprehensive technical support system that includes repair and inspection of instruments possessed by our customers, we have tried to enhance customers' confidence on our products and services.

Cloud service

We offer a cloud service that enables customers view and download graphs and data from measuring instruments at sites, via the Internet. Our service covers a wide range of tasks,from regular observations to remote site monitoring at the time of emergency and disaster.

Rental service

We offer rental service for some of our products, in addition to their sale. The service has been used for various purposes, including temporary uses and for emergency monitoring.

Track records of installation of our products (abridged)

Area	Customer	Product/ project description
Hokkaido and Tohoku	Hokkaido Regional Development Bureau	Otaru-Jozankei Line maintenance and management system
	Hokkaido Regional Development Bureau	Automatic observation system for water intake measurement
	Tsugaru Dam Construction Office, MLIT	Monitoring system for reservoir improvement work
	Shinjo River Office, MLIT	Mt. Gassan landslide and water level observation system
	Sunakozawa Dam Administration Office, Akita Prefecture	Automatic observation system with extensometer
	Land Improvement Enterprise Federation, Yamagata Prefecture	Waterproof water level gauge
	Miyagi Prefecture	Erosion control forest survey and water level observation equipment
Kanto	Metropolitan Expressway Company	Elevated bridge pier inclination management system
	NEXCO East Japan Engineering	Automatic monitoring system with anchor load cell
	Tokyo Metropolitan area	Groundwater survey before preparation of a housing site
	Odawara Civil Engineering Office, Kanagawa Prefecture	Float-type water level gauge for hot spring
	Awa Civil Engineering Office, Chiba Prefecture	Hegurishimo landslide monitoring system
	Yunishikawa Dam, Tochigi Prefecture	Groundwater level observation around a weir
	Funabashi City, Chiba Prefecture	Remote monitoring system for regulating reservoir water level
	Tomioka Civil Engineering Office, Gunma Prefecture	Automatic landslide monitoring system at Uchiyama mountain pass
Hokuriku and Shin'etsu	Yuzawa Erosion Control Office, Hokuriku Regional Development Bureau, MLIT	Meteorological observation system in Imokawa River basin
	Iida National Highway Office, MLIT	Alert management system for safe construction work in San'en Nanshin Koarashi district
	JR East Japan	Strain and water level observation at elevated bridge of Toyama Station on Hokuriku Shinkansen Line
	Toyama Civil Engineering Center, Toyama Prefecture	Landslide prevention survey in Mizusu district
	Ouchigata Land Improvement District, Ishikawa Prefecture	Water level monitoring system for reservoir and water-dividing dam
	Himekawa Erosion Control Office, Nagano Prefecture	Emergency measurement system for earthquake disaster in Hakuba-mura, Nagano Prefecture
Tokai	Fuji Erosion Control Office, MLIT	Installation of landslide monitoring equipment in Yui
	Tokuyama Dam Construction Office, Japan Water Agency	Automatic observation system in a col section of Tokuyama Dam
	Central Nippon Highway Engineering	Installation of integrator for dynamic observation on cut earth and slope sections of Shin-Tomei Expressway
	Tono Agriculture and Forestry Office, Gifu Prefecture	Automatic remote observation system in Tono District for prefectural reservoir development work
	Gujo Civil Engineering Office, Gifu Prefecture	Landslide monitoring system in Gukei district
	River Development Construction Office in Upstream Region of Miyagawa River, Gifu Prefecture	Automatic groundwater observation system at Nyukawa Dam
	Toyota City, Aichi Prefecture	River water level management system
Kansai	Kii Mountain District Erosion Control Office, MLIT	Measurement and monitoring on river course blockage
	Rokko Erosion Control Office, MLIT	Configuration of Debris flow monitoring and alarm system
	West Nippon Expressway Co., Ltd.	Abutment monitoring device for construction of Ibaraki-kita IC
	Nishimuro Promotion Bureau, Wakayama Prefecture	Road disaster prevention system on National Highway 168
	Yoshino Civil Engineering Office, Nara Prefecture	Slope investigation and observation system in Tenkawa-mura
	Tamba Agriculture and Forestry Promotion Office, Hyogo Prefecture	Slope monitoring system for preventing torrential rain disaster
	Hitokura Dam Administration Office, Japan Water Agency	Slope observation (cloud monitoring)
	Nishiharima Branch Office, Hyogo Prefecture	Studies on tests and flooding plans for Kanaji Dam
	Wakayama University	Installation of LAN-based rain gauge in the university premises
Chugoku	Okayama National Highway Office, MLIT	Hydrological survey for Tamashima-Kasaoka Road
	Chugoku Shikoku Agricultural Administration Bureau	Tohaku disaster prevention network
	Japan Atomic Energy Agency	Survey on mine water amount at remains of open pit mine
	Hamada River Comprehensive Development Office, Shimane Prefecture	Configuration of dynamic observation system for comprehensive Hamada River development project
	Kita Ward Office, Okayama City	Rainfall monitoring and notification system for Shimomaki district
	General hospital (private-sector)	Rainfall observation and alarm system
Shikoku	Kochi River and National Highway Office, MLIT	Manufacture of water level gauges for Niyodo-gawa River system
	Tosa National Highway Office, MLIT	Slope monitoring system in Tachibana district
	Nakamura River and National Highway Office, MLIT	Dam body water level observation
	Central East Agriculture Promotion Center, Kochi Prefecture	Landslide monitoring system in Ao district
	Disaster Prevention and Erosion Control Section, Civil Engineering Department, Kochi Prefecture	Kochi Prefecture on-site landslide disaster monitoring system
	Central West Civil Engineering Office, Kochi Prefecture	Roadside slope monitoring system
	Seiyo Civil Engineering Office, Ehime Prefecture	Slope failure monitoring system
	Private-sector enterprise (Matsuyama City)	Water quality and water level observation for neutralizer
	River Section, Civil Engineering Department, Kochi Prefecture	Infrastructure-related river improvement work for Shimonokae-gawa River, etc. (Telemeter Water Level Bureau)
Kyushu and Okinawa	Saeki River and National Highway Office, MLIT	Safety measures implementation work for Higashi Kyushu Expressway
	Kimotsuki Central Irrigation and Drainage Office, Kyushu Regional Agricultural Administration Office	Dynamic observation in the vicinity of Atagoyama Farm Pond
	Irrigation and Drainage Office in Upstream Region, Ono-gawa River, Kyushu Regional Agricultural Administration Office	Water level gauge installation work in Oso
	Oyama Dam Construction Office, Japan Water Agency	Installation of slope observation instruments for Oyama Dam reservoir
	Kyushu Shinkansen Railway Construction Bureau, JRTT	Hydrological survey in the area between Isahaya and Nagasaki along Kyushu Shinkansen Railway
	Gokayama Construction Office, Fukuoka Prefecture	Installation of observation facilities for Keyago Bridge
	Oshima Branch Office, Kagoshima Prefecture	Consigned survey on comprehensive river basin disaster (landslide) prevention (Ura district)
	Sendai-gawa River Office, Kagoshima Prefecture	Delivery of groundwater level gauge for Tsuruta Dam
	Kyushu Electric Power Co., Ltd.	Equipment installation and measurement system expansion at Mimi-kawa river system
	Okinawa Prefecture	Inspection and monitoring on information communication equipment (water level, rainfall, image monitoring system)
	Okinawa Prefecture	Delivery of water level observation equipment as a countermeasure against river drought
Overseas	Mali	Survey for anti-desertification planning in southern Segou region
	USA (National Park Service)	Survey on moving amount (extensometer)
	Taiwan	Delivery of extensometers and rain gauges
	Armenia	Survey for landslide disaster countermeasures and management planning (extensometers, rain gauges, pipe strain gauges, etc.)
	Mexico	Slope disasters accompanying urban development (extensometer)
	China	Delivery of extensometers, etc.
	Indonesia	Delivery of extensometers, rain gauges, water level gauges
	Uzbekistan	Support project for improving landslide monitoring technologies
	S. Korea	Delivery of extensometers
	Pakistan	Delivery of extensometers, rain gauges
	Honduras	Delivery of extensometers, rain gauges, water level gauges, alarm units
	Bolivia	Preparatory survey for disaster countermeasures along Route 7 in Bolivia
	Sri Lanka	Delivery of extensometers, rain gauges, water level gauges, pipe strain gauges
	Croatia	Delivery of extensometers, rain gauges, water level gauges, alarm units
	Mauritius	Landslide countermeasures project
	Ethiopia	Delivery of landslide countermeasure equipment (pipe strain gauges, etc.)
	Vietnam	Delivery of extensometers, rain gauges, water level gauges, etc.