eTRUST
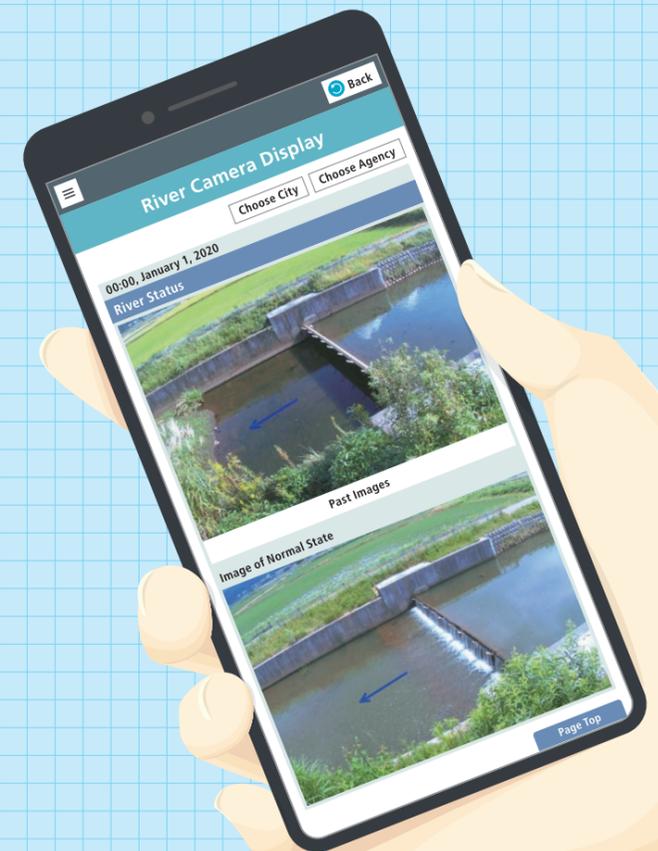
We <u>watch over</u> rivers, to protect livelihoods.

We monitor rivers in real-time.
We protect everyday lives
through the power of IoT,
so people can live without worry.

River Camera Display
Choose City | Choose Agency
00:06, January 1, 2020
River Status
Past Images
Image of Normal State

https://etrust.ne.jp/corporate/

Cloud Based Disaster Prevention Monitoring System
STAND GUARD

We protect the many rivers of Japan.

Since our founding in 1935, we have seen firsthand the threat of floods, rising water levels, and natural disasters.

With experience and expertise built on real field experience in industrial device maintenance and electricity/information facility construction as our foundations, we have continued to provide the solutions that are needed by local polities.

In particular, many entities both public and private, from the national, prefectural, and local scale, to private companies and local organizations, have placed their trust in our cloud-based disaster prevention solution STAND GUARD as an effective riverside disaster prevention solution.

As a guardsman to protect precious human lives and property, STAND GUARD watches over rivers to protect everyday lives.

POINT

01
Essential functions, wherever they're needed.

02
Whenever, wherever, to whomever, all through the cloud.

03
Customizable for every situation.

04
Mindful to the environment and to local views.

STAND GUARD Disaster Prevention Cloud System

eT-Cloud

Display recorded observation data on a purpose-built management interface or in web browser in real-time.

CLOUD

River Imaging

Automatically photographs rivers at set intervals for regular status updates. By checking images in real time, appropriate evacuation orders may be given.
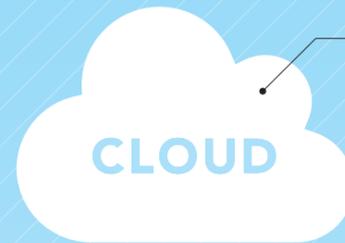
STAND GUARD Disaster Prevention Cloud Camera

eT001s

Record footage completely wirelessly and automatically send to cloud servers.

About STAND GUARD

STAND GUARD is the name given to our disaster prevention system.
"Stand Guard" in English means to stand guard, or a guardsman.
The soldiers guarding the palace in England are also called STAND GUARD.
Our name comes from our wish to watch over and protect our customers' safety and livelihoods, just like the strong soldiers standing guard at a castle.

Government Agencies and Local Governments

Because our system reports accurate river situations at a maximum of every 2 minutes, it enables appropriate situation comprehension and evacuation orders.

Private Citizens

Our system allows users to check the situations of rivers from anywhere at any time through the internet via smartphones and PCs.

Essential functions, wherever they're needed.

No power supply & wiring work required

Solar Panel

Camera

Power Supply

By generating power through solar panels, we avoid the need for the power supply or wiring work.
This allows the system to be placed anywhere without being affected by existing infrastructure.

Since the system generates solar power and communicates via LTE, it does not require communications cables or industrial power sources. It can be placed anywhere, without being affected by infrastructure conditions. Additionally, solar panels, the camera, and batteries are all small and lightweight. They can be mounted on street lights, utility poles, or and bridge scaffolding, and installation is quick and low-cost as a result.

Simple Piping   Street Lights   Steel Piping   Concrete Piping

Able to operate for over a week without power.

| Day 1 | Day 2 | Day 3 | Day 4 | Day 5 | Day 6 | Day 7 | Day 8 |

Can monitor for 8 continuous days without sunlight.

By equipping a small motherboard with an industrial USB camera, we have succeeded in greatly lowering required system power. By combining a 30 Watt solar panel and 26 Ampere battery, we have also realized long-term operations even in conditions without sunlight. The system can continuously monitor rivers without additional power for up to 8 days.

A high-quality camera that enables night-time monitoring

Smartphone Image

AM1:20

Even for high-quality smartphone cameras, low light dramatically lowers legibility.

STAND GUARD Image

AM1:20

Fully legible imaging of river status even when only starlight is available.

Based on MLIT Project Guideline Specifications

eTRUST is a member of the MLIT-led River Technology Revolution Project. With increasing heavy rain disasters in mind, this project aims to improve efficiency and sophistication of river management efforts by incorporating the newest technologies such as IoT. Despite recent heavy rains, there is an issue where the danger of flooding has not been adequately communicated, causing a lack of appropriate evacuation behavior. River monitoring cameras that allow real-time monitoring of rivers via image data plays a major role in disaster situations such as river flooding.
STAND GUARD meets specifications required by the MLIT, and has been adopted by many relevant government agencies and local governments.

■**Required Specifications (MLIT) and STAND GUARD Compatibility**

Major Specifications (Excerpt)	Compatibility
Easily installable outdoor camera system	◎
Designed for 5 years of continuous post-installation use	◎
Night-photography capable (e.g. moonlight (min. brightness 0.5 lux))	◎
At least 7 days of image delivery without sunlight or power (appx. 2000 transfers)	◎
Max. of 1000JPY/month/machine comms fee when sending still images	◎
Still images and footage can be viewed via the internet (stills should be JPEG format)	◎

Whenever, wherever, to whomever, all through the cloud.

A one-stop cloud service for management and viewing.

Send Data → **Save to Server** → **View Data**
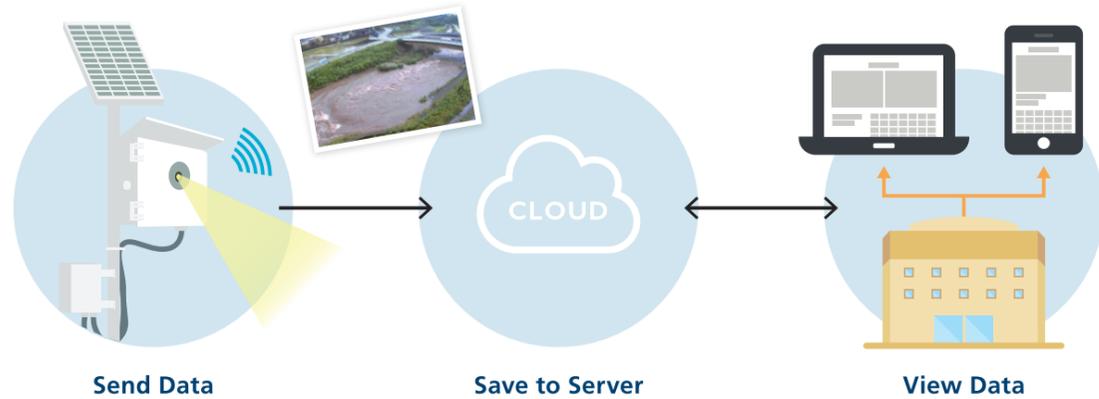
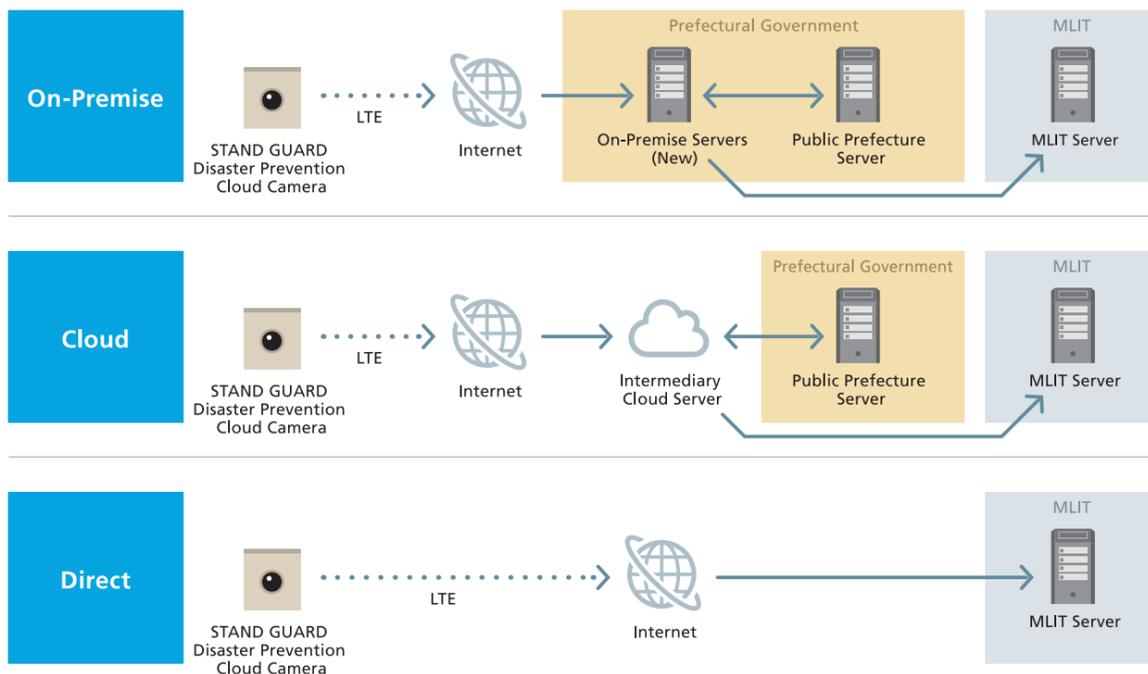The Disaster Prevention Cloud Camera takes photos at a maximum rate of once every 2 minutes. Image data is sent to servers by connecting to the internet via LTE communications.
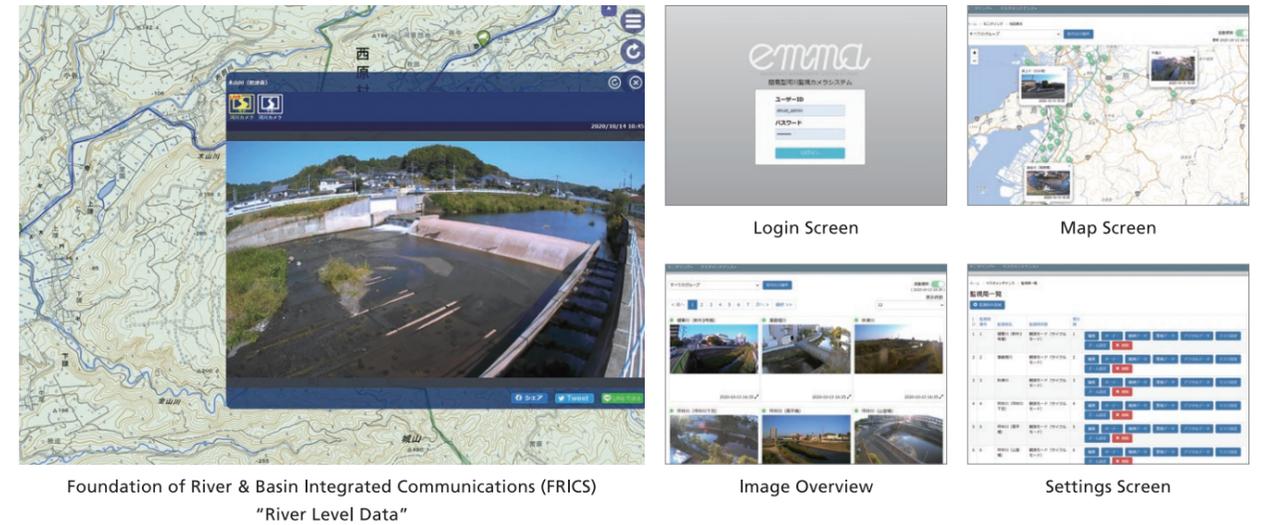
Data served to our servers can be viewed in real-time from a purpose-built management interface. The data can also be sent to public servers for local governments, or the publicly available residents' disaster prevention website "River Flood Information" on the MLIT servers.

3 Sending Methods

On-Premise
STAND GUARD Disaster Prevention Cloud Camera — LTE → Internet → Prefectural Government [On-Premise Servers (New) ↔ Public Prefecture Server] → MLIT [MLIT Server]

Cloud
STAND GUARD Disaster Prevention Cloud Camera — LTE → Internet → Intermediary Cloud Server → Prefectural Government [Public Prefecture Server] → MLIT [MLIT Server]

Direct
STAND GUARD Disaster Prevention Cloud Camera — LTE → Internet → MLIT [MLIT Server]

Management Interface for relevant agencies and local governments

■Example images of browser-accessible Management Interface

Foundation of River & Basin Integrated Communications (FRICS) "River Level Data"

Login Screen

Map Screen

Image Overview

Settings Screen

Private citizens can access via public website

■We enable accurate and convenient information delivery

By request of each agency, we are able to provide public access to camera images via disaster prevention websites. We can provide information through easy-to-understand layouts built for devices such as smartphones, PCs, and tablets. Public access can be given or denied by each municipality's request.

Connectivity with other sensors

STAND GUARD

STAND GUARD
Disaster Prevention
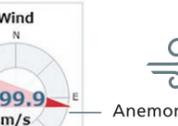Cloud Camera

eT001s

+

STAND GUARD
Disaster Prevention
Cloud System

eT-Cloud

+ Rain Gauge
+ Anemometer
+ Thermometer
+ Barometer
+ Radiation Monitoring Devices
+ Human Sensor
+ UV Intensity Meter
+ Hygrometer

The system is able to work together with a variety of sensors, from temperature humidity, rain level and wind speed, sunlight, UV-rays, and even human motion.

Combination Example

Temperature
27
18   36
9   45
0   54
31.4
℃

Humidity
40   60
20   80
0   100
73
%RH

Air Pressure
1013
953   1073
1,007.0
hPa

Wind
N
W   E
999.9
m/s
S

Thermometer — Hygrometer
Barometer — Anemometer

Weather data can be checked together with local images within the same screen.

Usage examples in non-riverside scenes

Mega-solar farm monitoring

Beach monitoring

Mountain region monitoring

Illegal disposal monitoring

Construction site monitoring

Our system may be used for many situations beginning at riverside monitoring, but also for tsunami preparation at beaches or ports, avalanche prevention through snowfall monitoring, real-time monitoring of disposal sites and construction sites.

Small and unobtrusive

High miniaturization at appx. **1.5 kg**

Standard Color

Environment-specific Color

With the launch of our new 2019 model, we have successfully miniaturized our camera to be small and lightweight. Compared to previous models, the new system is appx. one-third the size and half the weight. Casing color is also available in standard white as well as environment-specific colors such as brown.
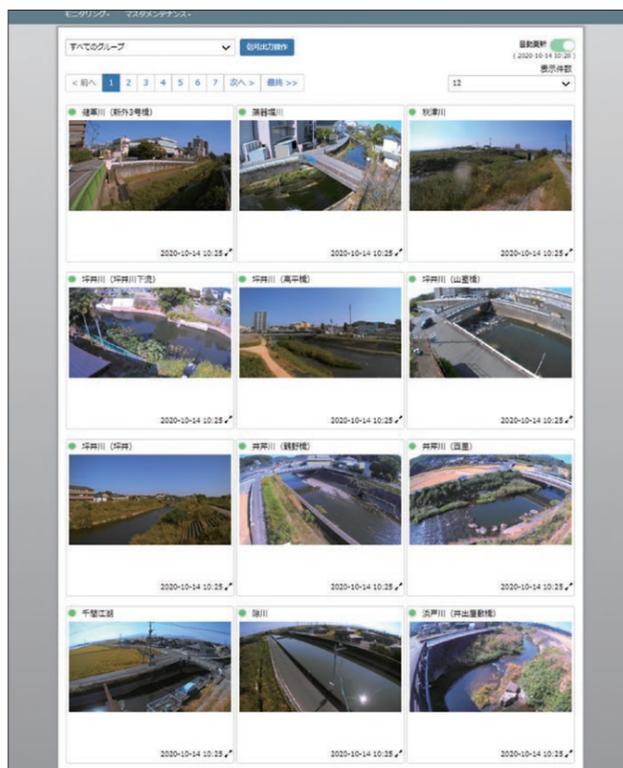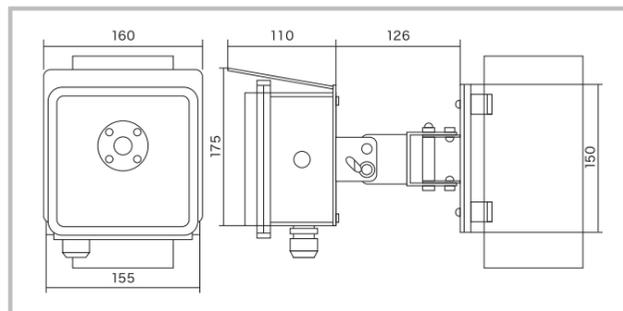
STAND GUARD Disaster Prevention Cloud Camera System

eT001s

Our newest model released in 2020 as a successor to the "eT001", which has won the trust of local and national governments in over 1000 instances in operation across Japan.
We have succeeded in greatly improving cost and functionality by pursuing energy efficiency and miniaturization.

Image sensor	1 / 2.8 inch CMOS
Effective pixels	Appx. 2.13 megapixels
Output resolution	VGA (640×480) HD (1280×720) FHD (1920×1080)
Lens type	Fixed focus lens
Horizontal angle of view	50 degrees / 90 degrees (selectable when shipping from factory)
Analog input	DC 0-5V / 4-20mA
Serial port	RS-232C / RS-485 / TTL
Digital input	Dual channel (Includes sensor-linked photography)
Digital output	Dual channel (Includes LED lighting control)
Weight	appx. 1.5kg (excludes metal fittings)

160 110 126
175 150
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STAND GUARD Disaster Prevention Cloud System

eT-Cloud

This is a web application that allows the viewing and confirmation of images taken by the disaster prevention cloud camera. The system supports clear decision-making by organizing images taken from multiple cameras into one spot.

Main Features

■**Scheduling**:
Enables scheduled photography at specified intervals.

■**Sensor-linked photography and email notification**:
Allows email notification to a registered address whenever a sensor receives input.

■**User-specific monitoring station and viewing area selection**:
Allows customers to select viewable areas on a user-to-user basis.

■**Default-state image registration**:
Can register a default image for normal situations for each monitoring station for comparisons.

■**Email notification**:
Sends email notifications to registered users when observation data exceeds specified values.

■**Multi-device support**:
Viewing functionality supports display devices such as PCs and smartphones, and automatically selects appropriate layouts.

OPTION | We have prepared customizations to meet your use case.

LED and Infrared Lights

By selecting LED or infrared lighting, the system can capture clear images at night even in mountainous or remote regions where there are few light sources such as street lights.

Power supply voltage
AC / DC12-24V

External input
Lights may be controlled remotely or by sensor No-voltage contact input Transistor input

External output
Light intensity sensor output No0coltage contact output

Waterproofing
IP66

Weight
950g

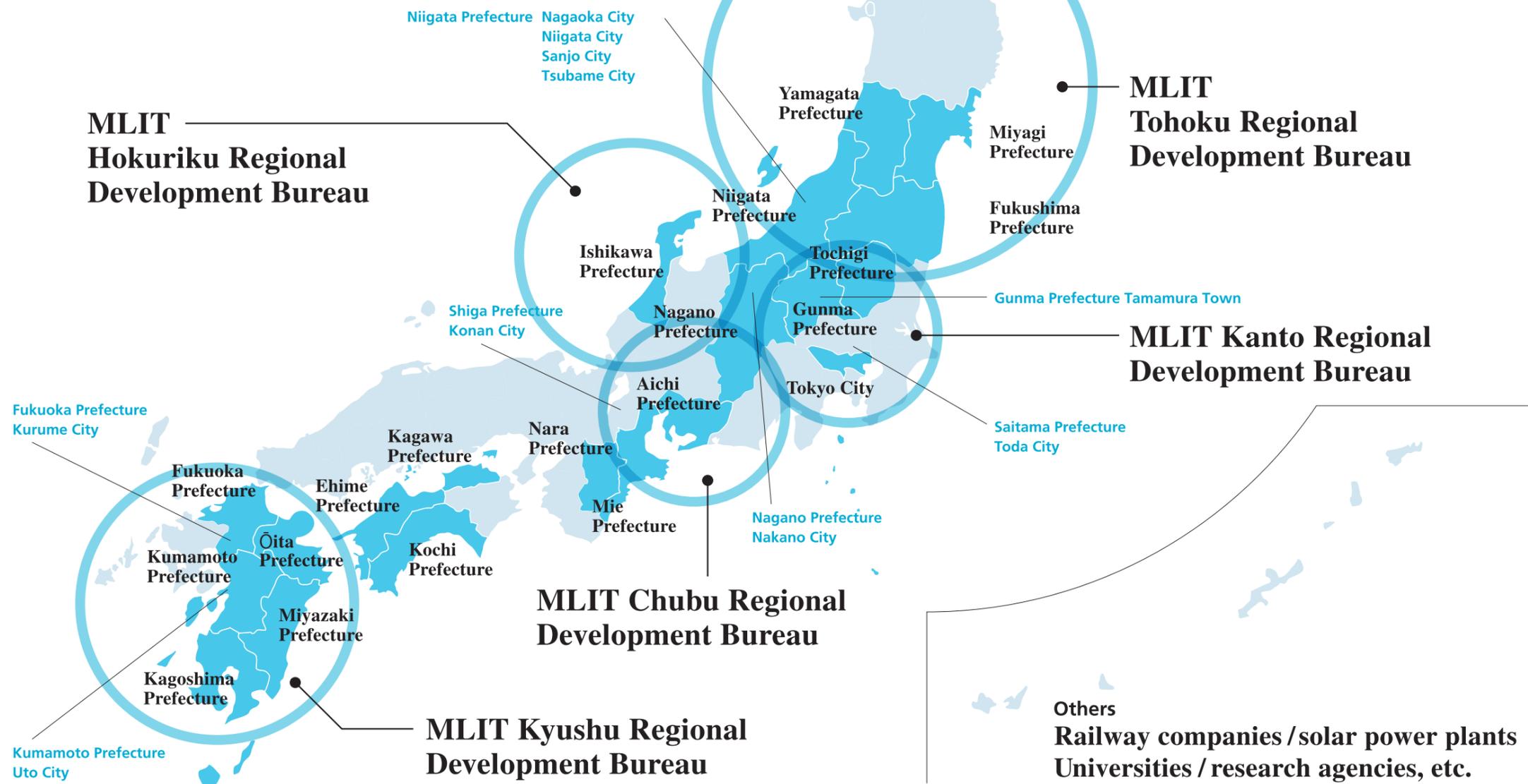| Temperature / humidity compatibility |
|---|
| -50 to 50C / 10% to 90%RH (However, requires zero condensation) |

Water Level Gauge

Uses an electric wave type, no-contact gauge system.
Is resistant to damage from rapid water level increases or flooding, and can stably send data even during water-related disasters.
We can provide models appropriate to your required specifications.

EXAMPLES AND CASE STUDIES

The STAND GUARD disaster prevention cloud camera system is currently in use by 5 MLIT regional agencies and 20 regional municipalities including prefectural governments. This comes in the wake of accreditation based on participation in demonstration experiments for the MLIT's "River Technology Revolution Project (#3)" as well as Tokyo City's "Advanced Disaster Prevention Technical Practical Use Support Project". Our systems are also in use overseas as river monitoring systems in nations such as Myanmar and the Philippines with different specifications.

"Results" are a sign of trust by our customers, and we have received high ratings for our after-purchase care and maintenance as well.

Niigata Prefecture Nagaoka City
Niigata City
Sanjo City
Tsubame City

Yamagata Prefecture

Miyagi Prefecture

MLIT Tohoku Regional Development Bureau

MLIT Hokuriku Regional Development Bureau

Niigata Prefecture

Fukushima Prefecture

Ishikawa Prefecture

Tochigi Prefecture

Gunma Prefecture Tamamura Town

Shiga Prefecture Konan City

Nagano Prefecture

Gunma Prefecture

MLIT Kanto Regional Development Bureau

Aichi Prefecture

Tokyo City

Nara Prefecture

Saitama Prefecture Toda City

Fukuoka Prefecture Kurume City

Kagawa Prefecture

Fukuoka Prefecture

Ehime Prefecture

Mie Prefecture

Nagano Prefecture Nakano City

Kumamoto Prefecture

Ōita Prefecture

Kochi Prefecture

Miyazaki Prefecture

MLIT Chubu Regional Development Bureau

Kagoshima Prefecture

Kumamoto Prefecture Uto City

MLIT Kyushu Regional Development Bureau

Others
**Railway companies / solar power plants
Universities / research agencies, etc.**

Overseas

Myanmar, Thilawa Special Economic Zone Environment monitoring system

We built systems for water level and weather data measurement in 4 locations within the Thilawa Special Economic Zone (SEZ) in the Republic of the Union of the Myanmar.

The Philippine FACE Project (JICA Partnership Program project)

We introduced a disaster prevention system based on a simple river monitoring camera system in local settlements and regions undergoing urbanization with the aim of creating a regional system that can be operated and managed by local residents.

The Republic of Bangladesh Ministry of Foreign Affairs ODA Project Research

We strengthened river monitoring capability with our proprietary river monitoring systems at several locations as part the Japanese government's technical assistance to Bangladesh, a nation said to flood in 1/4th of its land during rainy seasons.

Nighttime rain footage case

Nighttime rainfall drastically raised water levels
Water levels continued to rise after strong rains continued intermittently well into the early morning. Strong river flow can clearly be confirmed from late at night to early morning. (Images excerpted from footage shot at 5-minute intervals).

Rainfall in 1 hour | Point **A** | Point **B**

PM 17:00 — **7** mm
There was strong rainfall 7mm per hour.

PM 23:00 — **3** mm
Weak rain continues to fall, but water levels remain unchanged.

AM 03:30 — Strong rain of **25** mm
Strong rainfall begins causing water level to rise. River strength also increases.

AM 05:00 — **0** mm
While rain stops temporarily, water level remains high and river strength is still strong.

AM 08:30 — Somewhat strong rain of **18** mm
Rain begins again. Water continues to increase, now flooding.

*From Kumamoto Prefecture simplified river monitoring camera system

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Daytime rain footage case

Maximum rainfall recorded at 40mm per hour.
The eT001s accurately captured river changes over 12 hours including rainfall start time, peak time, and return to default water level. (Excerpted images taken from always-on 5 minute interval footage).

Rainfall in 1 hour | Point **C** | Point **D**

AM 08:00 — **3** mm
Rain begins. River still calm at both points.

AM 10:00 — Strong rain of **28** mm
Strong rainfall begins, with water level rapidly rising.

PM 13:00 — Extremely strong rain of **40** mm
Recorded max. rainfall for this day. Water level continues to rise and overflows onto the street.

PM 16:00 — Strong rain of **21** mm
Though rain weakens, water level remains high.

PM 20:00 — **6** mm
7 hours after peak rainfall, water levels return to near-default state.

*Taken from homepage of Kurume City, Fukuoka Prefecture.

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