

# PROTECT DDD SYSTEM

Drone Detective & Disabling System





# For safety measures in airspace.

The DDD system proposed by our company is a proprietary technology designed to safely address the challenges of implementing UAVs (drones, etc.) as defined by the Ministry of Defense.

The drone's vigilant surveillance (detection mode) covers a radius of up to 25km, and it is flexible enough to adapt to various geographical conditions, unaffected by obstacles such as tall buildings. In drone protection mode, it emits a weak radio signal ranging from 200mW, which significantly reduces the chances of being pinpointed like high-power radars. It can neutralize the operations of drones that enter a protection radius of approximately 1.5~5km, enabling them to hover or perform an emergency landing in a safe location. Furthermore, the system's minimal impact on the human body and other GPS devices due to its weak radio signal output allows for reduced power consumption and excellent operational cost efficiency.





## ▶ Product Overview

### DDD

Drone Detective & Disabling System

DDD, which stands for Drone Detective & Disabling System, is a system designed for drone detection and neutralization. This system is capable of detecting drones within a radius of up to 25km and, once activated, rendering them incapable of remote operation, whether it's a single drone or a fleet of 100.

### ICD

Intelligent Communication Disruption

DDD employs a proprietary technology called Intelligent Communication Disruption (ICD). This technology disrupts all communications, including commands from the transmitter necessary for drone flight, and vital drone control information such as GPS coordinates. With this critical information blocked, drones react differently depending on their individual programming. Many commercial drones, when faced with such a situation, will switch to a function that returns them to their take-off point, but since their location information is also disrupted, they remain in place, attempting to gather information. As they desperately try to collect data, their power consumption increases, and when their power is running low, they initiate an automatic safe landing in the same spot. This prevents drone intrusion and ensures a safe landing right at the point of intrusion. This protection mode is effective for both a single drone and a fleet of up to 100 drones.





## ► Features of the DDD System

MADE IN  
Japan

Our compact system, utilizing our proprietary technology, is capable of detecting long-range drones in all weather conditions. It operates without interfering with communication equipment and does not disrupt airport operations. This system is compact, easy to transport, highly efficient, and cost-effective. It can be integrated into area protection systems at a low cost, or installed on vehicles and ships for easy mobility.

### Detection

This system adopts a passive approach that does not emit radio waves, in contrast to active radar systems.

It possesses the capability to detect signals specific to drones, without radar detection of non-drone entities.

The detection range extends up to a maximum of 25km, and because it does not emit radio waves, it cannot be pinpointed to a specific location.

It operates as a standalone system without the need for a special network.

### Protection

Compatible with all civilian and military drones, without affecting other communication systems.

Utilizes weak radio waves (200mW~) and has no impact on the human body or peripheral devices.

### Common

Energy-efficient, can be started with a 12V vehicle power source (operable for approximately three weeks with a 12V battery).

Compact and lightweight (approx. 3kg), can be carried by hand to locations without roads.

**Tripod** Lightweight Type: 5kg / Heavyweight Type: 20kg

Switching between automatic and manual modes requires no specialized operational training.





# It can be operated safely with domestic production, maintenance, and data security measures in place.

## Safety

The detection function is passive and does not affect the operation of aircraft, even in the vicinity of airports, special shielding equipment is not required.

## Mobility

Thanks to its lightweight and compact design, it can be deployed in various models, from vehicle-mounted to backup transport in one model.

## Transportability

It can be deployed for vehicle-mounted or backup transport, all in one model, due to its small and lightweight design.

## Environmental Durability

No special equipment is required, and it is unaffected by weather conditions and day-night variations in temperatures from -20°C to 60°C.

## Usability

No special licenses are required for operation, and there is no need for special training.

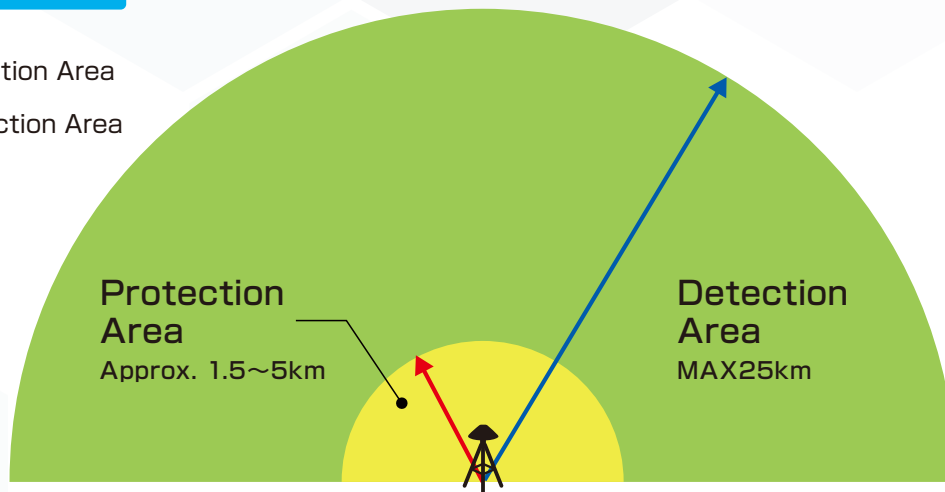
## Supply and Maintenance Accessibility

A rapid backup system minimizes downtime in case of unexpected issues.

## ► System Range Chart

### Detection Mode

- Detection Area
- Protection Area



Q: What happens in the protection mode?

### Protection Mode

When a drone enters the protection area...

1.5km above the ground

Drone operator

1.5km Radius

Defense Distance

Protection Area (Radius: 1.5~5km)

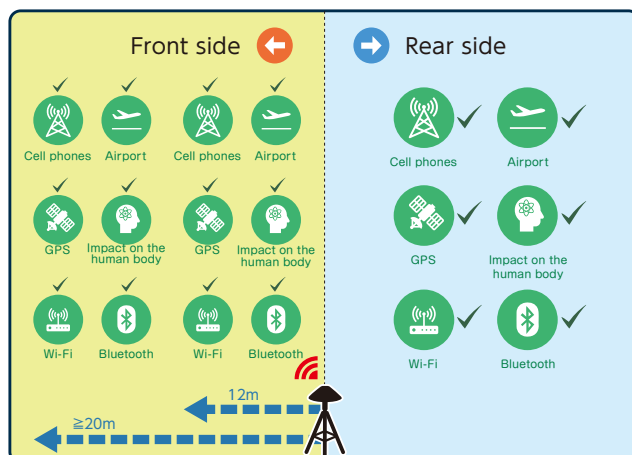
**A: When a drone loses its commands...**

- 1 It remains in place until its battery is depleted.
- 2 It immediately lands.
- 3 It may be blown by the wind and collide with obstacles, causing damage.
- 4 It may fall or land on water, resulting in damage.
- 5 It may be carried away by the wind.

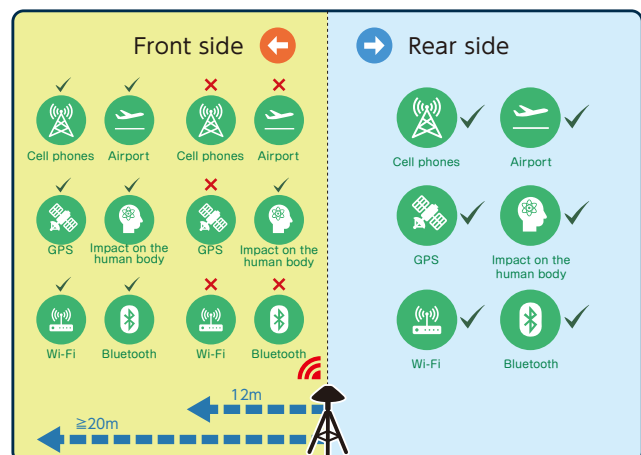
※The outcome may vary for each drone.

Q: What are the effects of the front and rear of the head unit?

### detection mode



### protection mode



※The above values are based on test results with a radio output of 600mW.

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## DDD System Demonstration Test

### DDD System Demonstration Test

FUKUSHIMA ROBOT TEST FIELD

#### ► Date and Time

November 4, 2022, from 13:30 to 15:00

#### ► Location

Fukushima Robot Test Field

#### ► Participating Government Agencies

- Cabinet Secretariat, Promotion Office for Small Unmanned Aircraft Measures.
- Ministry of Land, Infrastructure, Transport and Tourism, Civil Aviation Bureau, Unmanned Aircraft Safety Division.
- Ministry of Internal Affairs and Communications, Radio Department, Core and Satellite Mobilem.
- Communications Division.
- National Police Agency, Security Bureau, Security Division 1 and 2.
- Ministry of Defense, Joint Staff Office.
- Japan Coast Guard, Security Division.
- Cabinet Office, Support Team for Nuclear Disaster Victims' Lives.



▲ Portable DDD Kit.

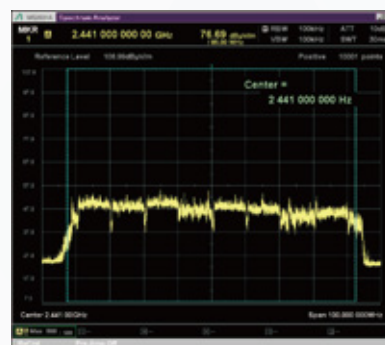


▲ View of the demonstration test through live broadcast.

### Electric Field Strength Measurement Results

FUKUSHIMA ROBOT TEST FIELD

Date	November 4, 2022		
Location	Fukushima Robot Test Field 83 Shin-Akanuma, Kayahama, Haramachi-ku, Minamisoma City, Fukushima Prefecture		
Measurers	Ishihara, Teramoto, Hanada		
Results			
Measurement	DDD - Receiving Points (Measurement Points)		
	Electric Field Strength when the drone became passive	dBm	76.69dBμV/m
		dBμV/m	
	The distance from the receiving point (measurement point) to DDD when the drone became passive : Altitude 10m		43m
reference	*The distance from the drone to DDD when the drone became passive		44.14m
	Measurement Conditions: During this measurement, the mobile phones of the relevant individuals were switched off.		Wi-Fi and Bluetooth off
Waveform	Electric Field Strength 76.69 dBμV/m		



The waveform that protrudes in this spectrum is believed to be emitted from the unmanned tractor that was operating at the time. \*In the registration inspection, the total power of 1 to 3 transmitting devices is specified as the specified power. Therefore, the setting of the marker for this measurement was "Integration" zone bandwidth (85MHz bandwidth) total power as the indication value (electric field strength), not "Peak". Considering the distance of 43m at which DDD affected the drone, it is assumed that DDD has almost no impact on other electronic devices.

## ▶ Product Specifications and Performance

### DDD Main Unit

**Height** 1430mm **Weight** approx. 16kg

- 1 Head Unit / diameter 375mm
- 2 Tripod / H1400mm  
(1100mm when opened)
- 3 Operating Application • Tablet PC
- 4 Dedicated box / H1400×W900×D500mm  
(12V battery built-in)



#### Monitoring and Control Application

- Detection Radius**  
For small drones, within a radius of up to MAX 25km.
- Manual drone defense button**
- Alarm warning upon drone detection**
- Drone defense radius.**  
The radius is approx. 1.5~5km when the altitude is 20m higher.
- Automatic drone defense button**
- Sensor head malfunction indication**
- Drone detection display**

Specifications		DDD Pro4		DDD Mobile	
		type-1	type-2	type-1	type-2
Detection Head Unit	Size : W375×H150mm Weight : 3kg	○ Detection & Protection	○ Detection Only	○ Detection & Protection	○ Detection Only
Power Supply	12~55V DC	○	○	○	○
Temperature Range	-20~60℃	○	○	○	○
Interface	RS-485	○	○	○	○
drone control frequency band (full band support)	20MHz~6GHz	○	—	○	—
Radio Output		200mW, 2W	—	2W	—
Protection Range		180°	—	360°	—
Detection Range (range adjustment : 1.5km /5km /10km /25km)		○	○	○	○
All-Weather		○	○	○	○
Automatic Control		○	○	○	○
Vehicle and Vessel Mounting		—	—	○	○

#### Product Features & Performance

Detection Function	Radius MAX 25km : 180° / Radius MAX 25km : 360°
Protection Function	Radius approx. 1.5~5km / Can deter 1 to 100 drones
Interface	Can transmit acquired UAV data
Safety	Passive system
Mobility	Total weight : approx. 16kg [ Head Unit : 3kg / PC : 1kg / Tripod : 5kg / BOX : 7kg ]
Environmental Resistance & Durability	Dustproof and waterproof specifications
Usability	No special training required, can switch between automatic and manual modes
Manufacturing & Maintenance	Manufactured and maintained in Japan

Development

■ Inquiry

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