

### Hitachi City Fire Department Disaster Site Image Transmission System

**TOUGHBOOK**

**Sending real-time information about disaster situations to the HQ.  
Precisely grasping what is going on to ensure accurate decision making.**



Hitachi City Fire Department, a representative agency of Ibaraki Prefecture's emergency fire response teams, is the operating base on the front lines of disaster relief in the prefecture. The department is always dedicated to preserving the life of the residents through various activities. When torrential rain hit the Kanto and Tohoku regions in September 2015, the department dispatched its personnel to Joso City, Ibaraki Prefecture, as an assistant team from the day the disaster occurred until the situation was under control. The department places tremendous emphasis on gathering incident information on the scene of a disaster so that it can use such data to carry out swifter relief operations. To enhance its efforts, the department has become the first in Ibaraki Prefecture to equip a chief vehicle with V-FAST, a system to stream live feeds of disaster conditions to the HQ, and a rugged 7-inch tablet TOUGHPAD FZ-M1 to run the system. The adoption of these devices has ensured efficient information sharing with the HQ, which leads to more accurate decision making.



(Left) Katsuto Otomo, Firefighting Unit Chief of Defense Div.  
(Right) Kazunori Kashimura, Ambulance & Rescue Unit Chief of Defense Div.

#### Background to introduction

##### Responding to a demand for a rugged device to share information, which can be used even if it is exposed to water on the fire ground.

A key to implementing speedy relief operations at fire or natural disaster sites is to accurately grasp what is going on at the scene in the earliest stages of such operations and develop an appropriate strategy and system solution to safeguard disaster victims. Hitachi City Fire Dept. dispatches its chief vehicle to the scene where huge building fires or other catastrophic incidents that may inflict further damage on the neighborhood occur. The crews first work to pinpoint where a fire started, promptly gather information about the condition of the surrounding buildings and the danger of flames spreading, and speedily relay the incident updates to the HQ. This leads to accurate decision making whether and where backup units should be deployed and confirm if additional equipment is required on scene.

The fire department used to rely on voice communication over the radio. However, the department found it time-consuming to inform the HQ of the complicated conditions of a mass casualty incident, and also found it difficult to precisely grasp what was going on through verbal messages. To overcome the challenge, the department's command squad members took cameras to the scene. However, they needed to stop what they were doing when taking a sequence of photographs to report the progress of their operations. To tackle this issue, the department started seeking out a system in which the squad members wear wearable cameras to record and stream live feeds to the HQ. The department faced another challenge—an extremely harsh and hazardous environment at the scene of disaster.

"If we use mobile devices to share information at the scene of fire, they may be exposed to water or mechanical shock such as bumping or drops in our busy duties. Therefore, a shock- and water-resistant device is the only



(Left) Yoshihito Takane, Direction Unit Chief of Defense Div.  
(Right) Yukio Komakine, Direction Unit Chief of Defense Div.



An exterior view of Hitachi City Fire Dept.

viable choice for the squad,” explained Otomo, who is responsible for introducing a new system. The department then turned to V-FAST, which had already been used to transmit the images of emergency sites by Chikusei City Joint Administration Bloc Office Association’s fire department in Ibaraki Prefecture. Hitachi City Fire Dept. finally decided to introduce V-FAST and the rugged 7-inch tablet TOUGHPAD FZ-M1 with shock- and water-resistant design to run the system.

### Why TOUGHPAD FZ-M1 was chosen

Point 1	Point 2	Point 3
Water-resistant design that allows the device to perform even if it is exposed to water	Shock-resistant design that protects the device from drops or bumping	Compact design that makes the device easy to carry around

### Introduction benefits

#### Allowing the HQ to view live feeds of disaster situations and provide appropriate direction to bring them under control.

Hitachi City Fire Dept. started to use V-FAST to stream live feeds of the scene of a disaster to the HQ in April 2018, and was the first to use such system in Ibaraki Prefecture. When emergency calls come in, the fire department’s control center gives direction to mobilize the chief vehicle. Upon request from the center, it rushes to the scene of disaster. Three types of cameras are used to record the live feeds of the scene: Cameras mounted on the roof of the chief vehicle are used to capture the entire image of the scene from a fixed angle; wearable cameras that the squad members wear on their helmets are to catch the detailed image of the scene; and TOUGHPAD FZ-M1’s built-in cameras act as a camcorder to more vividly capture images of each of the disaster situations.

The entire process to stream the recorded live footage is very simple. When the TOUGHPAD FZ-M1 is turned on, the V-FAST app will start. You can use the app to choose one of the cameras to stream live feeds through a mobile phone line to the HQ’s Fire Defense Division and command and control center and on-site control centers. The snapshot function allows you to capture and transmit the still image of the scene you need to share. Based on the live feeds and still images, the decision makers can appropriately grasp what is going on at the scene, adjust the number of emergency vehicles or personnel, send necessary rescue equipment and materials, and coordinate with partner agencies.

The command squad on scene always carries TOUGHPAD FZ-M1, which may be exposed to water accidentally when the squad is busily engaged in its operations. However, the squad can continue to use the device without worrying about it because of its water-resistant design. Squad member Komakine said, “It’s impossible for us to operate devices with great care when we’re so busy performing our missions in the field, so we’re lucky we can use it without care.” Squad member Takane explained, “V-FAST, which we currently have adopted, helps us greatly reduce the burden of recording live feeds of disaster conditions to more speedily deliver necessary data to the HQ. As a result, our efforts can be more focused on sharing disaster information with the neighborhood residents.” Hitachi City Fire Dept.’s emergency vehicles are all equipped with TOUGHBOOK rugged laptops. This makes it possible for the HQ to monitor and control each vehicle’s whereabouts to more effectively develop a strategy on which vehicle should be deployed.

Benefit 1	Benefit 2	Benefit 3
Allowing to share an update on the scene of a disaster in real time	Helping to greatly reduce the squad’s burden of information-sharing	Monitoring the whereabouts of vehicles to appropriately deploy them

### Future outlook of using TOUGHPAD FZ-M1

#### Aiming to gather information through drone photography, which leads to more appropriate decision-making.

Hitachi City Fire Dept., receiving positive feedback concerning the introduction of the said system, is aiming to strengthen its ability to gather higher-quality information. To this end, the department has already started to conduct a pilot project on drone videography. “Drone videography enables us to check the conditions of the scene of a disaster with a bird’s-eye view. This helps us more precisely recognize the risk of the disaster spreading and give appropriate direction on where backup vehicles should be deployed,” explained Kashimura with great expectations, who works with Otomo to manage the system. “Our efforts will be more advanced on scene.”

The department will have its firefighters, as well as the command squad, wear wearable cameras when entering a hazardous scene to share information about the progress of their operations, and will use drones to record and stream aerial live feeds of the scene at the same time. This will enable the HQ to give more precise direction. Hitachi City Fire Dept.’s relief efforts are expected to continue to make progress with using TOUGHBOOK and TOUGHPAD devices.



Chief vehicle and onboard camera

The camera mounted on the roof of the chief vehicle is used to capture the whole image of the disaster from a fixed angle to help grasp what is going on.



(Left) TOUGHPAD FZ-M1 at the scene of disaster (Under) The site displayed on the HQ’s monitor

TOUGHPAD FZ-M1 enables personnel on scene to share their information in real time with easy operation over a mobile phone line, even in tunnels in which radio communication is difficult to be ensured. The HQ’s PC monitor displays the conditions, as viewed from the squad.



- Snapshot function of TOUGHPAD FZ-M1  
The snapshot function enables you to shoot and send the still image of the most important subject you want to share.



- Command squad and wearable camera  
The wearable camera has contributed to a reduction in the time to share information. As a result, the squad can put more focus on on-site operations including communication with neighborhood residents.



- Detachable laptop TOUGHBOOK is used to confirm the location of each vehicle. The crews can use laptops, which are mounted on every vehicle, to report their current situations so that the HQ can track the entire movement.