

# The most advanced emergency command vehicles in the world – a user solutions guide

In recent years the new generation of emergency command vehicles introduced by UK fire and rescue, ambulance and police services has helped support huge improvements in the way these services manage the different types of incidents with which they deal. In the past commanders and their support teams used old style incident command vehicles, usually little more than mobile (paper) map rooms with a few radios and whiteboards.

Now services are in an era of improved communications across incident grounds and back to headquarters, using mobile satellite broadband and live wireless video, thereby delivering high speed data flows, real time situational awareness and a Common Operational Picture – within all levels of services and between services. This is important, because it means services are now able to perform much more effectively (and some of the mistakes of the past, highlighted by major incidents where lives have been lost unnecessarily, are less likely to happen).

## Driving development

Supporting this pioneering collaborative work within the emergency sector, Excelebrate Technology has helped drive the development of what are now considered to be some of the most advanced mobile emergency command vehicles in the world. There is now growing international interest in learning from highly innovative UK projects such as the HART (Hazardous Area Response Teams) programme, which is delivering a standardised, national approach for UK ambulance services dealing with incidents inside the ‘hot zone’, such as CBRN attacks, USAR incidents, chemical spills and releases, as well as other threats to life.

Excelebrate Technology has supported these initiatives by sourcing, developing and introducing many of the new technologies that emergency services have needed to implement their plans. Key among these technologies has been the use of mobile satellite broadband and wireless video to deliver data, voice and video to commanders. Ten years ago the company was quick to see the potential of these emerging technologies and to adapt them for specific emergency service use,

*With their full use of satellite broadband, wireless video, interoperable communications and integrated management systems from Excelebrate Technology, the UK is now considered to have some of the most advanced mobile incident command vehicles in the world.*



working closely with customers, such as the national HART ambulance service project team, the fire and rescue services and police forces.

## Achieving maximum operational benefits

Critical to the success of these developments has been the need to identify how emergency service communications requirements can be best

supported by the use of new technologies, followed by prototyping, systems integration within compact and ergonomically suitable work spaces, displays and control panels, thereby creating easy-to-use solutions. This has been complemented with testing, training and exercising to deliver maximum operational benefits for the investments made.

These solutions are now being seen in increasing numbers of forward command vehicles and



Mobile satellite broadband and wireless data, video and voice solutions from Excelebrate Technology are now being used by all three UK emergency services to improve public safety, interoperability and operational efficiency.

incident command units around the UK, vehicles which are changing command doctrine and the way emergency services work.

While there are variations in the different types of command suites and technologies used within the various emergency command vehicles supported by Excelebrate Technology, there is generally a core set of common systems, features and functionality. Some of these solutions are unique to Excelebrate, having been developed by the company's Research and Development (R&D) department.

To help services identify which solutions are likely to be of most use to them, Excelebrate has compiled a straightforward User's Guide to Mobile Emergency Command Solutions.

### Mobile satellite broadband communications

This is at the heart of Excelebrate's technology offering, providing commanders with a robust, easily accessible and high capacity capability. Roof-mounted transportable satellite solutions provide resilient stand-alone broadband connections giving access to secure telephony, data, video, internet and e-mail facilities. Satellite broadband is highly robust, a key factor during major emergencies when other communications systems can be overloaded.

Satellite communications enable command and control vehicles to receive and transmit data from all responders and emergency teams and achieve a

Common Operational Picture. Combined with wireless networks, personnel using PDAs, laptops mobile phone and data terminals can access tactical plans, live video streaming or information from strategic emergency planning software. The range can be extended using self-powered, rapidly deployable MESH wireless nodes.

For maximum resilience, vehicles can communicate directly with each other as well as their appropriate HQs and other locations. Some HQs, such as the West Yorkshire Fire and Rescue Service, are now also using satellite broadband receivers at their command centre as well as on their mobile command vehicle.

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## Digital Dashboard Management Interface (DDMI)

The Digital Dashboard Management Interface (UK Patent Application 1116053.8) is a highly innovative solution, which enhances system performance, reliability and communications interoperability.

The Digital Dashboard Management Interface gives users vital data at a glance. This new digital dashboard display system has been designed by Excelebrate Technology's R&D department specifically for the emergency services market to provide a clear, intuitive interface linked to the wide variety of command and support technologies found on the latest generation of incident command vehicles. The company has already received the Department of Health's authorisation to begin implementing DDMI into all HART command vehicles.

The simple-to-use interface enables operators to monitor and control the systems and technologies on board command and control units effectively and efficiently, enabling them to focus primarily on their operational roles and to get the best out of their technology and training investment.

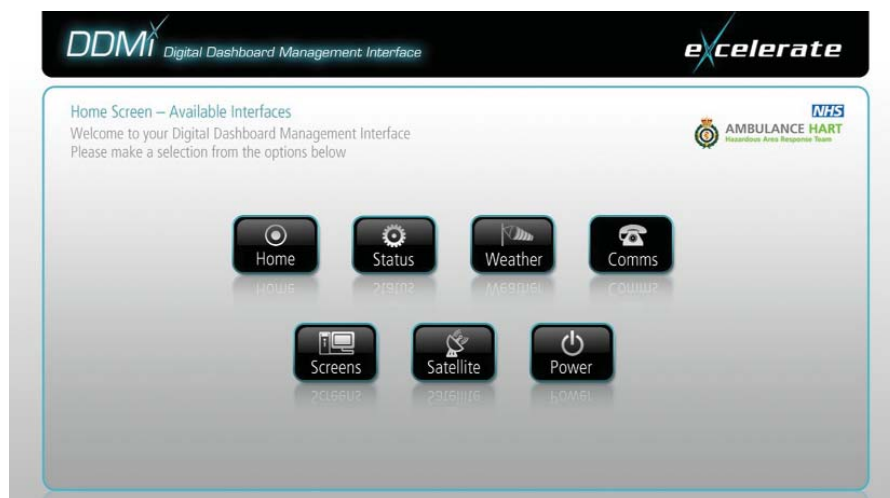


The Communications Management Suite enables multiple communications devices to be patched together for single and conference calls.

DDMI is a modular solution that incorporates the following features and benefits to date:

**The Navigation Bar** identifies each module within the interface and incorporates an alert system for each page. The alert system notifies the user of activity from within a specific function, enabling the operator to immediately monitor and control the area of interest.

**The Status page** incorporates all relevant technology and systems on board command and control units. It uses a simple traffic light system to identify and determine the health of all on-board systems, inclusive of updates. This is crucial for determining any system error, whether it is that



Main DDMI interface provides intuitive controls for systems monitoring and management.

power has simply not been turned on or to identify major faults. It also acts as a permanent reminder as to the array of networks, solutions and applications that are at the operator's disposal.

**The Excelebrate Communications Management Suite (PBX)** has been developed to enable multiple communications devices including radios, GSM, TETRA, mobile and VoIP phones and landlines, to be patched through to one another and to enable voice conference participation via a variety of different devices from multiple worldwide locations. The interface is an easy drag-and-drop one and can be operated and controlled within the DDMI solution on board the command and control unit. This feature helps overcome a major barrier to full interoperability between the different communications systems likely to be used across an incident.

**The Satellite Controls interface** simplifies the management and monitoring of satellite communications with intuitive touch-screen controls, making this critical function a straightforward process capable of being handled by non-technical staff. By being fully integrated into the overall DDMI solution users are spared the extra work that would be required to go into a separate system for satellite management. Good controls are essential for checking satellite signal strength and ensuring robust, resilient communications and uninterrupted data flows. The system also overcomes doubts concerning line-of-sight issues.

**Weather monitoring** – weather is a key factor in the management of many incidents, from gas leakages to large-scale fires. Local weather conditions may be quite different from (and faster moving) than indicated by nationally provided forecasts. The weather function enables local weather conditions, such as wind direction, to be monitored continuously and emergency commanders notified of any significant changes.

**The Power Management function** is an interface that interacts with all systems within the communications rack and ensures that the automatic start-up/shut down of all the systems is managed safely and securely at the touch of 'one button'. This eliminates the need for each rack-mounted system to be turned off manually or in isolation, thereby ensuring that the correct sequence is followed.

**Screen and Video Source selector** – a simple drag and drop interface gives operators the ability to match any number of video sources to any or all required displays on board the unit and change what appears on them to suit specific incident requirements.

**Future proofing and further development** – the support DDMI provides to emergency services will continue to grow as Excelebrate's R&D department develops new interfaces for delivering expanded and improved functionality.

DDMI



Excelerate can supply a wide variety of COFDM cameras including the dual thermal camera shown above.

Satellite broadband connectivity prices now compare very favourably with other telecommunications offerings, and the application of the technology can be used for a huge variety of different emergency management purposes, including delivery of dynamic updates for mobile Automatic Number Plate Recognition (ANPR) systems, now being used operationally by Surrey Police after extensive testing.



Aerial platform with wireless camera capable of transmitting live imagery back to fire and rescue command vehicle.

### Wired, wireless and rapidly deployable cameras for live video viewing

Optical and dual-thermal cameras can be mounted on self-powered tripods, the Sherpa climbing camera platform, extendable, pneumatic masts and aerial platforms to transmit live video by COFDM into ICUs and control rooms for viewing by command staff operating at the scene of an incident. Video can also be streamed via secure servers to higher level command for online access in real-time by authorised personnel. Body-worn cameras, such as those worn by Gwent Police mobile officers at the Ryder Cup, can also be used

to provide fast reaction video of incidents. In addition, Excelerate can install receivers to provide 'heli-tele' downlinks, allowing aerial images from police helicopters and UAVs to be viewed in the command vehicle.

### Independent GSM networks

RapidNet is a Private Mobile Network system that enables an independent GSM network to be generated at the scene of an incident if public GSM networks are overloaded or compromised during major incidents. It is capable of delivering the reassurance of full telecoms and voice recording capabilities irrespective of the presence or capability of any incumbent national cellular network.

### Command displays

Incident Command Units can also include multi-agency briefing areas with wall-mounted electronic whiteboards and touchscreen displays that run

specialised command support and emergency planning applications, as well as being used for video-conferencing and the viewing of live video footage or television news channels. Large touchscreen displays can also be installed externally for outdoor briefing sessions.

### Excelerate Technology WiFi nodes

To support the new trend for using wireless cameras and ruggedised laptops across incident grounds, portable, battery-operated WiFi extension nodes can be used to create complete wireless MESH networks. Such nodes can be in the form of rapidly deployable tripods (with hot-swappable batteries), body-worn nodes and vehicle-mounted nodes.

[www.excelerate.info](http://www.excelerate.info)

See *Excelerate Technology on Stand 128 at ESS 2011*

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## The unique Sherpa climbing camera and communications platform

Excelerate Technology, through its subsidiary Norton, is the owner and developer of Sherpa, the highly innovative 'climbing camera' CCTV and communications platform system that automatically climbs up poles and places cameras and other emergency response communications equipment in high temporary viewing positions, giving emergency management, prison service and security personnel improved coverage of incidents and potential problems. Camera imagery can be controlled and viewed using iPads, iPhones or mobile and in-vehicle systems.

Sherpa has the potential to make a major contribution to the policing of public order and counter terror operations and is generating strong interest around the world.

It is the only system in the world that can provide such a quickly deployed temporary CCTV infrastructure for use in giving continuous coverage of riots, public order events, major fires, prison 'blind spots', transport and border security checkpoints and other potential areas of interest. The system is already used in the UK, South Africa and Australia, and there is growing interest in Europe, Asia and the Middle East.

### Straightforward solution

Regardless of the countries into which the Sherpa system has been sold, users, such as Logan City Council in Brisbane, Australia, have seen how it delivers a straightforward solution to common problems, such as monitoring parks and public areas, keeping an eye on religious and community events and gathering evidence for prosecutions. Sherpa has even been found useful for customers assessing locations for permanent cameras without the cost and risk involved. By avoiding the necessity to install permanent CCTV camera systems, which are not always needed to address a temporary problem, the system delivers very positive benefits at a much lower cost.

With Sherpa, within a very short period of an incident being responded to, when time is critical, a network of PTZ (Pan, Tilt, Zoom) video surveillance cameras can be installed and relaying



live incident imagery back to command vehicles. Imagery can then be combined with other incident information to create and share a Common Operational Picture with all relevant parties. The cost is substantially less than video obtained from helicopters, and can provide high-resolution imagery for evidential purposes.

Because of its versatility Sherpa can be used in a wide variety of different roles. By police forces, for example, it can be deployed quickly to monitor rioting and public order incidents. For fire and rescue services it can be used to provide high-level wireless camera video imagery of incidents from a stable platform over a prolonged period.

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