

# Why two channels are better than one

A major UK ambulance service is using two-way paging to supplement the national TETRA radio network, adding a valued extra level of resilience to its radio communications.

**Words:** John Ridgway



Scottish Ambulance Service use PageOne's advanced two-way pagers from Swissphone. The RES.Q responder devices include a GSM wireless module for hybrid POCSAG/cellular alerting plus message acknowledgement. Options include GPS positioning for locating personnel, an emergency SOS button and Low Energy Bluetooth beacons for indoor localisation.

Though the UK operates a national TETRA radio network dedicated to its emergency services and other essential bodies, for one of these services an independent radio network is providing extra resilience.

In Scotland, two-way Responder pagers operating on the UK paging network of PageOne, part of Capita plc, provides a direct link with over 120 senior managers in the National Risk & Resilience team of the Scottish Ambulance Service – a mobile strategic operations team who provide 24/7 management oversight for large, protracted or serious incidents. And the service covers a huge area – not just the Scottish mainland, with its remote and mountainous regions, but the western and northern isles too.

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## Distribute key information

“The pagers help us to very quickly distribute key information across our management team,” explains Nick Sutton, Strategic Operations Manager for Scottish Ambulance Service. “The Ambulance Control Centres (ACCs) will distribute information via the pagers relating to day-to-day operations as well as specific incident-level information for our more serious and demanding incidents.”

But while most routine communication with ambulance crews is carried via their in-vehicle TETRA radios, Mr Sutton sees it as essential to maintain an independent line of communication with the strategic team, who typically travel to incidents separately in fast-response vehicles and could be away from their vehicle on other duties. “Pagers are sometimes looked upon as an ageing technology that could be replaced by the smartphone and/or digital radios,” he comments. “We feel it is important to maintain a resilient and independent means of communications with our on-call and responding managers that enables the ACC to quickly distribute key information.”

**“For the Scottish Ambulance Service, PageOne's two-way Responder paging has helped attain the goal of multi-network resilience.”**

For the Scottish Ambulance Service, PageOne's two-way Responder paging has helped attain the goal of multi-network resilience. “Any technology that they were already using had its own potential single point of failure,” says Raymond Fegan, of network operator PageOne Communications. Whether the technology is digital radio, mobile phones or one-way paging, he argues, all of them potentially represent a single point of failure. “It's great when it's working,” he says. “But when it goes, everything goes. Whereas our two-way pagers here in the UK, we have them operating across multiple networks. So not only are they sitting on our trusted and reliable national paging network, but they are also listening to any of the mobile networks – they've always got dual connectivity.”



An important benefit for Scottish Ambulance is the full audit trail that a two-way responder pager creates. Raymond Fegan of PageOne Communications says, “When you send a message to a two-way pager, not only can you tell they've received it, but you can then tell when they've read the message – and you cannot do that with an SMS.” The two-way Responder pager also holds pre-formed reply messages, which officers can quickly select and send when in a hurry.



## Critical messages stand out

For Nick Sutton, the Swissphone made paging devices, also help critical messages stand out from the day-to-day smartphone notifications and radio tones. “By having a separate device, it's less likely to be silenced or powered down as it should only be used for critical events,” he says. But there's more. “The two-way pagers add an important and, for a very long time, overlooked function to our communications – the ability for the recipient to reply to their message.

“In the near future, we are working with our CAD system supplier to develop a new two-way interface between the CAD and PageOne, which will allow us to leverage the information held in CAD to automatically page incident-level information. Replies from the two-way Responder pagers will also be more easily managed as they will be directed to the dispatcher responsible for the resource.”

## Automating response

In this way, the Scottish Ambulance Service hopes to make fuller use of the technology by automating procedures so as to create a consistent and effective message delivery system, relieving pressure on its ACC managers. “Those carrying pagers will be able to send a specific reply to the message they received and have it handled by CAD, which may result in a message being generated for the dispatcher, or the CAD carrying out some form of action based on the reply. For example, ‘Able to attend’ would generate an allocation request to the dispatcher responsible for the incident.”

[www.pageone.co.uk](http://www.pageone.co.uk)  
[www.swissphone.com](http://www.swissphone.com)

# Alerting: making doubly sure

For volunteer firefighters in Germany, a POCSAG paging system provides solid performance at modest cost and is a dependable backup for the national radio network.

**Words:** John Ridgway

In Saarland, the smallest of Germany's federal states, some 13,000 volunteers regularly provide standby fire cover and support for the rescue service through 52 voluntary fire brigades. Only in the capital city, Saarbrücken, is the fire and rescue service fully professional.

Alerting is coordinated centrally via ZRF Saar, the Integrated Control Centre of Saarland. "We are responsible for 210,000 operations a year," said Rainer Buchmann, its Director. "Large volunteer fire brigades here in the region have up to 180 operations per year, including up to 50 at night. This is a burden in terms of time and emotion. That makes it all the more important for us to alert volunteers only when they are really required."

herself as generally ready for action; and then, if an alert arrives, he can immediately notify the control centre whether he will participate in the operation or not. This allows Saarland to alert its first responders in a much more targeted manner and increases the efficiency of their operations (see below).

If the pager cannot detect the POCSAG signal from the dedicated radio network, it will automatically connect to the control centre via the cellular network, and subsequent alerts will be transmitted to the pager via cellular, too. This 'hybrid paging' feature ensures that volunteers can be reliably reached even in the Saarland region's border areas.

With a national TETRA network available in Germany, why did Saarland choose POCSAG for its alerting system? "To obtain the required coverage, we would have had to install far more TETRA base stations due to the higher frequency of TETRA and our topography," explained Rainer Buchmann. "The POCSAG network provides us with the necessary indoor coverage at only 20 percent of those costs. Furthermore, TETRA pagers are up to three times more expensive than POCSAG pagers. For this reason, we use TETRA for voice radio and POCSAG/GSM for alerting."

[www.swissphone.com](http://www.swissphone.com)

**"Swissphone's RES.Q pager includes a cellular module to provide a return communications path."**

A key requirement for an alerting system was radio coverage of virtually 100 percent of the state's terrain, outdoor as well as indoor. "And we need fast alerting," added Mr Buchmann. "In 95 percent of all cases, the emergency response forces have to arrive on the site of the emergency within 12 minutes after the emergency call was received at the control centre."

## Speed and redundancy

Saarland's choice was a resilient POCSAG (Post Office Code Standardisation Advisory Group) alerting system from Swissphone. Rainer Buchmann described the infrastructure that features Swissphone's 'Express Alarm' feature, saying, "Our operations control system has an interface to a digital alert radio network. The radio network controller optimises the alerting messages into POCSAG data packages with the aim of reducing the alerting time of large groups by far. The distribution of these data packages is done via a Wide Area Network (WAN) to dedicated master base stations. They transmit the alerting to the other 75 base stations, which receives and retransmit synchronously."

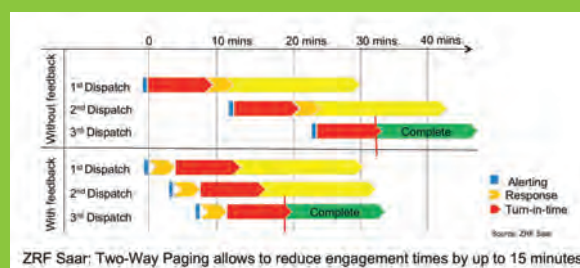
Redundancy, including the ability to tolerate a failure of central components, is another important feature. For example, if a master base station can no longer be reached via its normal IP connection, the system 'connects' the lost master base stations over the radio network. This procedure ensures the same radio coverage and availability of the network.

## Two-way communication

For use on the network, several brigades and rescue services have equipped themselves with Swissphone's RES.Q pager, which includes a cellular module to provide a return communications path. By pressing a button on the pager, a volunteer can declare himself or

## Two-way pagers save time

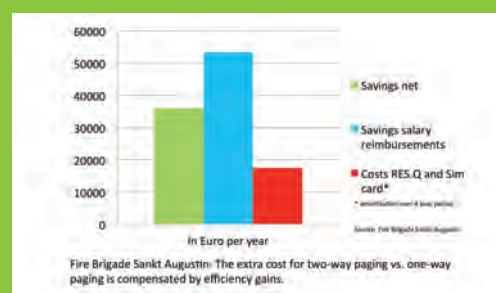
Thanks to the immediate feedback of the first responders using RES.Q two-way pagers, the dispatcher can immediately follow-up with a second and third dispatch if necessary.



The integrated control centre in Saarland has been able to reduce the time it takes to alert required amount of volunteer response teams and send them to the incident by up to 15 minutes.

## Two-way pagers save money

Elsewhere in Germany, the fire brigade of the Rhineland town of Sankt Augustin, saves wage costs of €53,500 per year through its 125 two-way pagers. The reason is that the fire brigade with its 247 volunteers can reduce unnecessary over-alerting because of timely feedback from the emergency response forces. This in turn reduces the compensation, which the municipality must pay to employers when they have released employees for fire duty.



The expense of acquiring two-way pagers and SIM cards is deducted from these annual savings (in the case of an amortisation over four years). Those acquisition costs amount to €17,500 per year for 125 devices (€70,000 divided by four). The net benefit from the feedback channel pager is therefore €36,000 per year (€53,500 minus €17,500). For an average annual budget of €750,000, this represents a saving of five percent. Thus it can be concluded that the savings more than compensate for the extra costs of the feedback channel solution. As a consequence of these results, the fire brigade of Sankt Augustin has decided to further invest in this solution and order another 49 RES.Q terminals.