



# **THINGS TO CONSIDER WHEN LOOKING FOR AN ALERTING SOLUTION FOR EMERGENCY RESPONDERS**



**MOTOROLA SOLUTIONS**





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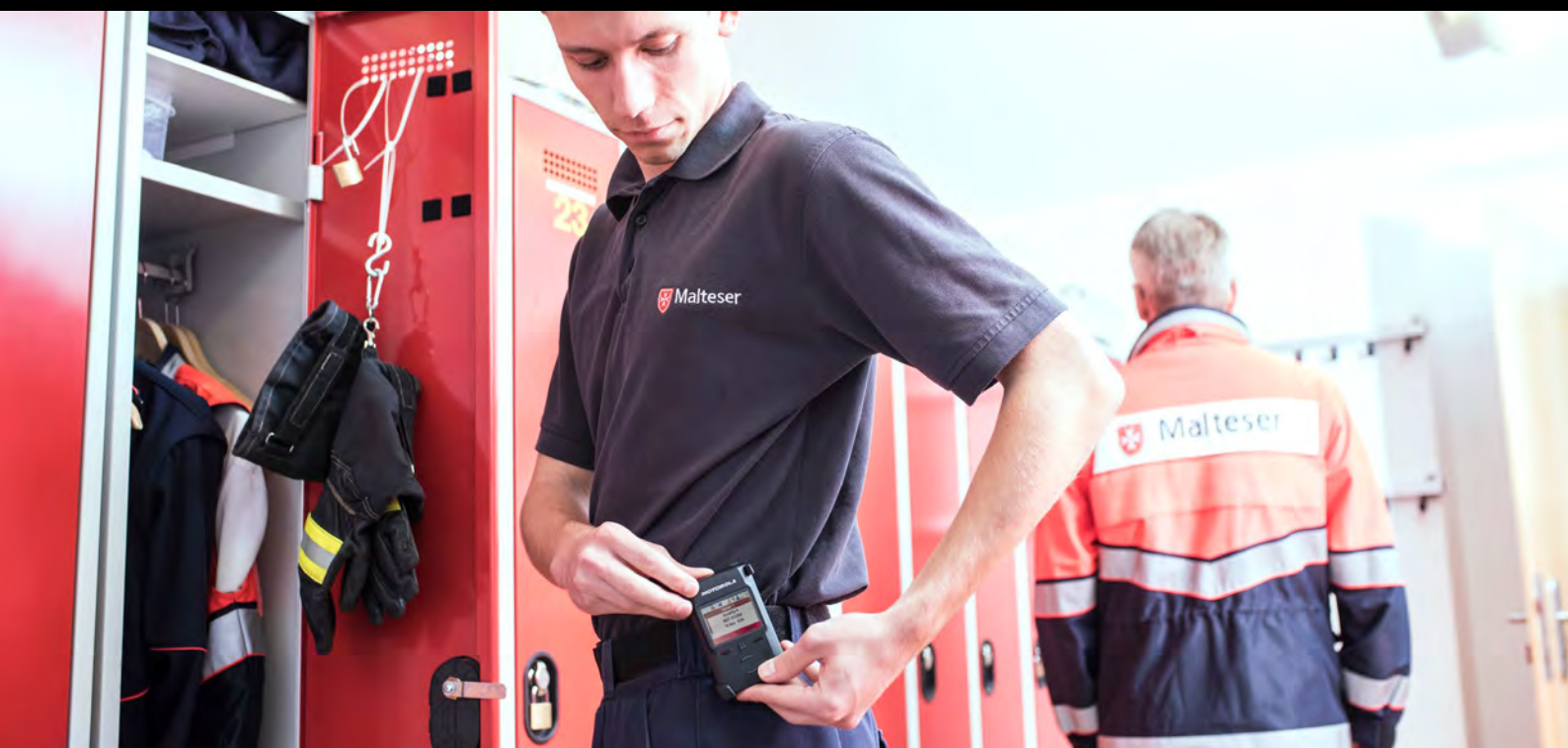
On-call public safety personnel and emergency service volunteers such as first responder paramedics and volunteer firefighters must be contactable at all times to respond to emergency calls. For these people, secure and reliable communications are essential if they are to respond to the call for help and save lives. In this guide we'll discuss the key things you should consider when looking for an alerting solution.



## THE RIGHT ALERTING DEVICE FOR YOUR USERS

The first thing to consider is what alerting device will your team need. The one million volunteer firefighters in Germany<sup>1</sup> and volunteers in other emergency services need to rely on their alerting devices to work at any time and in any situation. The alerting device needs to be intuitive to use and well designed, so that users never miss a message or an alert, and they can immediately understand all the relevant information. Long battery life is essential, so the device will be able to work for hours on end when out and about without a charge. The device also needs to be compact, so that it can easily be incorporated into everyday lives – at work, home or out and about.

# THE RIGHT DEVICE FOR YOUR VOLUNTEER EMERGENCY SERVICES PERSONNEL IS A PAGER



The right device for your emergency services personnel is a pager. When it comes to choosing your pager, you should look for a robust and rugged device, one that can tackle the challenges and environments that it's likely to face. When comparing rugged to non-rugged equipment, the average failure rate for non-rugged devices was around four times<sup>2</sup> that of the rugged ones. This has a knock on effect to cost – as, if the device you pick is likely to have a higher failure rate, you'll need to buy more of them, in order to have spares in stock, and thus tie your capital up in spare pagers. Also, if the

pager is broken and you can't reach your emergency personnel – what is the impact of that? Fire and rescue services cannot afford these failures and therefore need devices that have at least IP54 rating<sup>3</sup> for protection against dust and water. For use under tougher conditions, the technical standard MIL-STD-810<sup>4</sup> should also be considered. It's vital to have signal in the areas you need so look for alerting devices that have high receiver sensitivity as this will give you greater coverage in buildings and built up areas.

It's also important to recognise the different requirements of individual responders, so you should consider a pager that can be adjusted to the user's needs. Look for a pager that is intuitive to use, has a variety of carry options and the ability to adjust the alerting to the user's environment whether a loud ring for at home or out and about or a vibrate alert for when in a meeting at work.

<sup>1</sup> <http://www.feuerwehrverband.de/statistik.html>

<sup>2</sup> <http://computers.amrel.com/wp-content/uploads/2015/07/VDC-Research-Group-2027.pdf>

<sup>3</sup> <http://www.elektronik-magazin.de/page/ip-schutzklassen-25>

<sup>4</sup> <https://www.atec.army.mil/publications/Mil-Std-810G/Mil-Std-810G.pdf>



## DOES THE ALERTING SYSTEM OFFER THE RIGHT LEVEL OF SECURITY AND RESILIENCE?

The next thing to consider is the communications network - it needs to be secure and resilient.

Consider the security offered by the alerting system's network infrastructure - is it secure from eavesdropping or traffic analysis by hackers? Is it vulnerable to replay attacks?

Popular paging standards such as POCSAG do not provide standardised encryption for broadcast messages. Consequently, unencrypted POCSAG data will be vulnerable to attack by cybercriminals, who, with easily available technology and the right know-how, can listen in to emergency call-outs, interrupt communications or even send false message repeats<sup>5</sup>.

To combat these threats, POCSAG paging system suppliers have developed proprietary encryption solutions. While these help to bolster security, they are vendor specific

implementations, and thus limit choice for buyers. Only a standards-based encryption solution such as that provided by TETRA Air Interface Encryption, can address public safety security requirements while avoiding vendor lock-in.

In addition to security, also think about the resilience you need from your alerting system. In an emergency situation you need to be able to rely on the network to contact your teams. Unfortunately, it is often in such crisis situations that commercial cellular networks become congested, and in extreme cases, even break down. It is therefore vital that emergency responders rely on mission-critical, dedicated communications infrastructure that provides the necessary levels of resilience and availability.

For emergency services alerting, the BDBOS TETRA network, which covers 99 percent of Germany<sup>6</sup> offers the right level of coverage, resilience and availability. The network also meets public safety security standards and is certified by the German Federal Office for Information Security (BSI).

## THE RIGHT ALERTING SYSTEM USES A TETRA NETWORK

<sup>5</sup> <https://blog.trendmicro.com/leaking-pagers-how-insecure-tech-can-leave-your-organization-hopelessly-exposed/>

<sup>6</sup> <http://www.tetratoday.com/features/bdbos-in-it-for-the-long-haul>



## IS THERE A RETURN CHANNEL FOR RESPONDER ACKNOWLEDGEMENT?

In those key moments that matter, assembling your team quickly and getting them onsite to the incident is vital. Your alerting solution plays a key role in how effective you'll be.

With one-way paging systems such as POCSAG, several call-outs often need to be sent to ensure that alerting messages are received. Additionally, the absence of acknowledgement messages in one-way alerting systems means the dispatcher is unaware of who has accepted and therefore, whether additional call-outs to other teams are required. The traditional solution to this problem involves "over-alerting", a process by which call-outs are sent to more volunteer responders than are required for the specific incident. Over-alerting leads to an increase in operational costs due to the additional salary reimbursements and or other compensation payments to employers of volunteer responders.

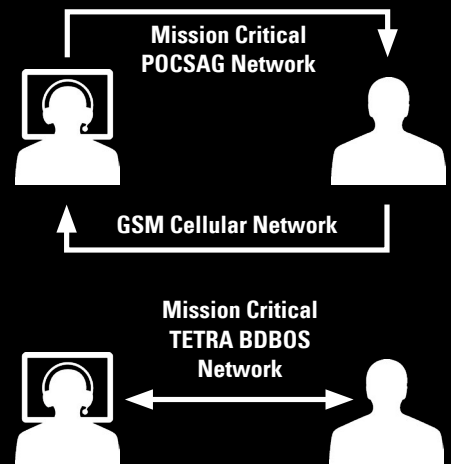
Two-way paging systems minimize over-alerting costs by providing real-time status information of the recipients of call-out messages. Further, by allowing responders to instantly feedback their status to the control centre, the time to alert the required number of volunteers and hence response time is significantly reduced.

# THE RIGHT ALERTING SYSTEM ENABLES TWO WAY COMMUNICATION OVER A MISSION CRITICAL NETWORK

Some two-way alerting solutions use hybrid systems based on a combination of POCSAG and GSM to achieve two way paging. While POCSAG networks offer mission-critical availability, GSM cellular networks are prone to congestion and are generally less resilient.

In contrast, TETRA-based paging solutions enable two-way communication between dispatcher and responder using the same network. Also, unlike a cellular network, that during an incident may be down or congested, the BDBOS network has resilience built-in, and prioritises TETRA Call-out alerting messages, so you can be sure, no matter how busy the network, your call for help will get through.

Another advantage of TETRA paging devices with built-in GPS receivers allow the dispatcher to see where the closest available resources are and alert them first. This enables the dispatcher to target the nearest and most appropriate resources to the incident, and ensure a rapid response.



## IS THE ALERTING SYSTEM BASED ON OPEN STANDARDS?

Avoid vendor lock-in situations by investing in solutions that are based on open standards. Alerting systems based on popular standards such as POCSAG typically integrate proprietary technology to provide secure two-way paging functionality. For example, some paging system suppliers offer authentication and encryption using proprietary implementations. Such solutions effectively lock buyers into a single vendor's paging system, limiting choice and increasing supply risk.

In contrast, TETRA is an open standard, so TETRA paging solutions leverage standardised Air Interface Encryption, End-to-end-Encryption and as a result offer multi-vendor alternatives. Furthermore, TETRA pagers, certified for the BDBOS network, support mutual authentication and encryption based on BSI SIM, protecting the alerting system from eavesdropping and spoofing attacks.

Consider also the need for scalability in your alerting system, especially when dispatching teams to major incidents. In addition to supporting standalone operation, modern alerting systems provide application programming interfaces to allow CAD systems to send and respond to paging messages. Integrating with the CAD system enables more precise targeting of call-out messages based on role, status and location.

# THE RIGHT ALERTING SYSTEM IS BASED ON OPEN STANDARDS

Additionally, CAD integration improves scalability, allowing large volumes of pager responses to be handled efficiently, reducing incident response times.

Integrating your TETRA paging solution with CAD offers the combined benefits of enhanced dispatching efficiency and multi-vendor flexibility. With TETRA paging systems, you are not limited to a single vendor's offering as paging messages are based on ETSI standardised Call-out messages.







## REACH FARTHER. RESPOND FASTER.

In those critical moments, every second counts. That's why we made the ADVISOR™ TPG2200 TETRA two-way pager simple to use, even with one hand. Quickly read and respond to messages with a bright, 2" colour display and familiar user interface. Carry the pager anywhere without it getting in the way thanks to a lightweight, compact design. And, since the TPG2200 is IP54 rated for dust and water protection, you know it will keep working even when exposed to the elements.

As one of the world's leading suppliers of TETRA radios, Motorola Solutions is a partner you can rely on. Because people are relying on you.

### KEY CAPABILITIES OF THE ADVISOR™ TPG2200 TETRA TWO-WAY PAGER

#### Based on TETRA Standards

- With support for ETSI standardised call-out

#### Enhanced Coverage

- Best in class RF performance with -116dBm static receiver sensitivity and Class 3L 1.8W transmit power
- Home station with external SMA antenna for extended indoor coverage

#### Secure two-way paging

- Encryption protocols BSI SIM and AIE TEA 1, 2, 3

#### Robust Design

- IP54-rated for dust and water protection
- Compliant to ETSI 300-019 1-7 Class 5M3 and MIL-STD 810 D/E/F rating to withstand tough environments

#### Easy to use

- Lightweight and compact design enables one-handed operation
- Simple controls and familiar Motorola Solutions user interface
- Powerful speaker, vibration alert and flashing LED Alert
- Service Coverage indicator - ensures user knows their coverage status
- USB-C to USB-A connector for programming and flexible charging
- Convenient charging with the home station or travel adapter





To learn more about how our **TETRA paging solutions** can help your organisation, contact your local Motorola Solutions representative or visit **[MotorolaSolutions.com/ADVISORTPG2200](https://www.MotorolaSolutions.com/ADVISORTPG2200)**

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