The Great Advantages of Digital Alerting - DiCal®

In combination with digital communication (P25)







SWISSPHONE



About the Swissphone Group

The Swissphone Group is a leading internationally operating supplier that designs and produces secure reliable alerting, resource management and dispatching systems, and solutions for public safety organizations (emergency services). As well as for a wide range of industrial sectors.

Our systems comply with international

standards. The market-leading Swissphone alerting and communication solutions for emergency services have long ago become prevalent standards. Swissphone products are extremely popular in Switzerland and the international markets due to the high quality of devices offered as well as our extensive know-how and leading-edge experience in the design and construction of communication systems.

In addition, Swissphone operates the Swiss national Telepage paging network, which is being used by most of the emergency service organizations for alerting. The reliable and secure Telepage network is also commonly used

Di**Cal**®



in sensitive industrial and commercial areas, as well as by private companies for their emergency response duties in the field.

Swissphone was founded in 1969 by Helmut and Erika Köchler and it has been under Swiss ownership ever since. The company has a prominent market presence in Germany, Austria, France, and in the USA. In addition, Swissphone possesses a dominant market position in the Northern European markets owing to its proficient partners. The corporate headquarters and the production site are located in Samstagern Switzerland near Zurich.

Swissphone's strategic success factors

-)) Swiss quality
-)) Knowlege of the alerting philosophy
-)) Customer intimacy
-)) Innovation
-)) Development and manufacturing
-)) Experience with large projects

Your partner for digital alerting

SWISSPHONE



DiCal[®] in combination/coexistence with digital communication (P25):

Your volunteers and standby specialists always in reach The most reliable alarming scheme at the best price

In a digital world of business critical communication for emergency or fire services, it is important to distinguish between critical communication (Voice) and alerting (alphanumeric).

Voice communication is used in a specific area, like a city, while the demand of alerting is county or state wide. The alerting process is the disaster proven service to reach volunteers at any time and any place.

Differentiation between alerting and communication





For these reasons it is recommended that the alerting process is given appropriate priority and supported with proven technology. Past experience of analog communication and alerting networks should also be taken into account. The interaction between alerting and communication should be minimized. It should also be ensured that the systems work reliably without involving third-party systems.

It is important that volunteer requirements are met, such as the need for good overall radio coverage in the area, small end devices, and secure transmission. Accordingly, professional organizations have different requirements.

Here, communication comes first. Powerful cost-efficient solutions are produced by exploiting the strengths of different technologies.

Swissphone's view of the future



Migration to a digital radio alerting network would go some way towards minimizing the weakness of time-consuming alerting in analog systems. The task of planning and implementing the digital communication solution can then be tackled.



SWISSPHONE



How the alerting philosophy of Swissphone matches with the requirements for an alerting system

What you need as a network owner:

- An economical and secure solution to alert voluntary or standby services
- Fast broadcast alerting to all required individuals or groups
- Large are coverage
- Long technology life cycle
- Defined alerts encoded as text message transmissions
- Saving and logging of alerts: the whole process is documented to enable incident reconstruction at any time
- A self-sufficient system that also remains reliable in disaster situations
- Motivated users (volunteers) willing to carry the device 7x24
- Low investment and operational costs (TCO)
- A reliable partner

What your volunteers need:

- To know when they are needed in any circumstances (day and night, for straightforward operations or in disaster situations)
- They need pagers not radios
- Vibration functionality if needed
- Trust in the technology
- Reliable and loud alerting
- · A robust device with high autonomy (several weeks)
- Light and easy to carry 7x24
- Simple, intuitive use
- Best reachability





Requirements for a modern alerting system

- 1. Fast delivery of alerting messages
- **2.** Parallel delivery of alerting messages to all required individuals and groups
- 3. Guaranteed reliability 24/7/365
- Highest reachability of first responders owing to professional radio planning focusing on geographical and in-house coverage
- **5.** Redundancy of all critical systems components as well as of emergency power
- 6. No congestion due to other users (e.g. voice traffic)
- 7. Low operational cost and long life cycle
- 8. Investment protection
- 9. Logging messages and status informations

Performance and data throughput

Broadcasting guarantees delivery of alert messaging within seconds to defined individuals or groups - in extreme situations to ALL first responders. Predefined messages avoid misinterpretations.

Availability and redundancy

System components are protected against failures using various planned fall-back scenarios so that the alerting system will remain fully operational and system management will be instantly informed. There is no single point of failure.

Network coverage and scalability

Solutions based on broadcasting (paging) require less transmitters than trunking systems (2-way). Full coverage can be reached cost efficiently also in rural areas and within buildings and tunnels. Scaling up or down the geographical coverage can be executed fluently.

Independent and separate

Mission critical alerting systems - including their power supplymust function at all hours. Thus, such systems must be planned and operated separately from commercial communications systems. Alerting and communication networks ought to be run separately so that cross-interference and total failure can be eliminated.

Backwards compatible and future-proof

Swissphone's experience in integrating new technology within existing systems and processes guarantees that alerting will stay 100% available also during the migration phase.

Swissphone, as an innovation leader, will continuosly take new alerting concepts into consideration.

Proven deployment and references

Swissphone stands for proven systems and best practices. We will introduce new developments and specific customizations in operations not before fully field-testing them. Large emergency organizations trust in us for long term collaboration.



Swissphone network infrastructure, terminals and applications

In an emergency every second counts. People in accident situations need immediate help. The emergency services have to be alerted as quickly as possible, which works best over alerting networks. They form the link between the emergency call center and the emergency personnel's end devices. To ensure that emergency services can be reached, alerting networks have to be reliable and failsafe. As early as the planning stage a variety of factors, such as the system's topography, radio coverage quality and failsafe capabilities have to be considered and built-in. As these factors are immutable, they determine the type and structure of the network. Swissphone took these requirements into account in the development of its radio networks and provides flexible solutions. The "One solution. different configuration" philosophy of the network covers various customer requirements. Different requirements can be met by configuring the two basic components – the base station and the paging network controller.





DiCal[®] Solutions for all requirements

Compact solutions for local networks



In the compact solution radio calls are transmitted over one base station. This base station can provide an adequate signal in the immediate vicinity of the transmitter site to guarantee a reliable alerting service. Alerting can be triggered locally or remotely over a control center and transmitted to the base station.

Primary-secondary solutions for regional radio networks



The regional solution consists of a primary and several secondary base stations switched into a group network. Messages are transmitted over the central base station to the radio network.

Base stations in the transmission reception range save the messages and then re-transmit them bit-synchronously to each other. This transmission can take place up to a maximum of 8 times in succession. Multi-primary-secondary solutions for efficient regional radio networks



The efficient regional solution consists of a several primary and secondary base stations switched into a group network. The messages are transmitted over a central base station to the radio network. Base stations in the transmission reception range save the messages and then re-transmit them bit-synchronously to each other. Thanks to the many feed-in points in the radio network transmission repetitions can be substantially reduced despite coverage being over a wider area.

Synchronous solutions for radio networks



The most efficient solution consists exclusively of primary base stations that are switched into one network group. The messages are transmitted bit-synchronously over all central base stations to the radio network. The primary base stations transmit bitsynchronously in the first transmission. This radio network configuration means that only one transmission is required for the entire coverage area. Repetition is dispensed with transmission time is minimized.

One solution, different configuration

All the radio network types referred to can only be recognized with the same components given an appropriate configuration. This affords users the greatest possible flexibility in setting up, migrating, and operating their radio network infrastructure. The controlling, configuration and monitoring components PNC (Paging Network Controller) is responsible for the radio network. This software supports all specified radio network types.

When configured appropriately base stations can be addressed and configured via a TCP/IP connection or a proprietary radio protocol.

Failsafe because of fallback scenarios

The radio network is designed for seamless transition from one operating mode to another. If, for instance, one or several connections in a synchronous solution are disrupted or interrupted, the radio network switches to multi-primary-secondary operating mode. The synchronous base stations that cannot be reached then run in the secondary operating mode until they can be used again as synchronous base stations. If the entire TCP/IP communication breaks down, the PNC can access an individual primary base station directly. The radio network then runs in primary-secondary operating mode. All the other synchronous base stations that no longer have a connection then run in secondary mode, thus maintaining radio network operation. Full functionality is preserved, only message throughput is reduced.



DiCal[®] alerting system demonstrated on an implemented solution in Germany

The administrative area of Lippe has taken the decision to transfer fire brigade and rescue service alerts completely over to POCSAG technology on the 2-meter band. An important factor in the decision to use Swissphone technology was the speed and security of alert transmission. This is even guaranteed where the terrain is demanding - as in the area of Lippe. The Lippe mountain region has marked variations, ranging from peaks and ridges to lowlands and hills.

Alerts issued in seconds...

Alerts are sent via wired and radio link communication to four multi-primary stations. After distribution the alerts are transmitted from the four multi-primary station time synchronously. The multi-primary network delivers sufficient field strength to ensure rapid and secure alerting in the area to be covered. The multi-primary site locations are in Lemgo, on the Hohe Asch, in

Köterberg and Tönsberg-Oelingenhausen. The radio network consists of forty base stations (4 primary and 36 secondary stations), which are distributed across the area so that they deliver homogeneous field strength overall. The site selection for the primary and secondary stations is determined from a radio network planning tool. The simulated field prediction is then verified in the field.

...and even in geographical basins

"The measured wireless coverage delivered by the digital alert network means that we are now finally well covered for the areas of Kalletal and Extertal, which were a problem until now", reports Friedhelm Plöger of the Regiebetrieb Bevölkerungsschutz (Government Civil Defence Force) for the area of Lippe. His colleague Meinolf Haase also adds: "The encryption of alerts also enables us to meet data protection directive".

D**íCal**



Doubly secure

The Swissphone system is doubly secure: during normal operation, the alert from the emergency center is transferred to two redundant paging network controllers PNC. The active one sends the alert on to one wire connected primary station and three further multi-primary stations, which are reached via a radio link solution. If either one of the two PNC fails, the other one automatically takes over and sends the alert to the four primary-stations. If both PNCs fail, the appropriate operators can send the alert via an emergency input position to the wire connected primary station. From there, the alarm message will reach the 36 secondary stations and the 3 remaining primarystations, which now works in secondary operation mode, and therefore the alert reception devices.

Fallback scenarios for extreme emergencies

If either of the wired primary-stations fails, the PNC will automatically connect the other primary-station. And if both wired primary-stations and either one of the radio link connected primary-station fail, the system independently switches to another operating mode, known as fallback mode. The surrounding primary and secondary stations register that a primary station has failed and take the message from another primary or secondary station. Fallback mode gets around the problem by using a remaining primary station, ensuring network wide transmission in spite of the loss of all the other primary feeders – albeit at a slightly reduced transmission speed. A patrol car has also been additionally fitted with a digital alert transmitter. If the emergency center were to fail, the alert could be issued via the patrol car.

Area of Lippe (North Rhine-Westphalia):

District area:	2'517 sqmi
Population:	app. 2 million
Basestation:	40 (4 primary)

References of DiCal[®] system projects in Europe

-)) Administrative area of Bautzen, Saxony
-)) City of Bonn, North Rhine-Westphalia
-)) City of Dessau, Saxony-Anhalt
-)) City of Göttingen, Lower Saxony
-))) City of Halle, Saalekreis, administrative area of Merseburg-Querfurt, Saxony-Anhalt
-)) Harzkreis, Saxony-Anhalt
-)) Region of Lausitz, Saxony
-)) Administrative area of Lippe, North Rhine-Westphalia
-)) Administrative area of Mansfeld-Südharz, Sachsen-Anhalt
-)) Administrative area of Olpe, North Rhine-Westphalia
- Administrative area of Pinneberg for the region of Steinburg/Dithmarschen/Pinneberg
-)) Administrative area of Schaumburg, Lower Saxony
-))) Administrative area of Siegen-Wittgenstein, North Rhine-Westphalia
-)) Administrative area of Vogtland, Saxony
-)) City of Wilhelmshafen, Lower Saxony
-)) South Tyrol, Italy
-)) Telepage, nationwide in Switzerland
-)) Lower Austria, Austria



Contact Information

Marco A. Stadler

Group CMO & Managing Director of Swissphone NA

Phone: +41 44 786 77 03 E-Mail: marco.stadler@swissphone.com

Brian Bonneville

Sales Manager

Phone: (800) 596-1914 ext. 6 E-Mail: brian@swissphonena.com

Jacob Effinger

Technical Support

Phone: (800) 596-1914 ext. 2 E-Mail: jake@swissphonena.com

Christopher Haag

Repair Center

Phone: (800) 596-1914 ext. 10 E-Mail: chris@swissphonena.com



Swissphone LLC 1194 West Ash Street, Suite C Windsor, CO 80550 Tel.: +1 800 596 19 14 Fax: +1 970 460 30 14 www.swissphone.com info@swissphonena.com