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# Did you know TETRA can do all this with data and apps?

## Introduction

TETRA is recognised as a leading mobile communications technology that is delivering mission-critical voice services to public safety organisations and mobile workers worldwide. However, TETRA data capabilities are often under-utilised. This article highlights some examples of TETRA data applications that are available from a wide ecosystem of innovative developers - learn how you can benefit from TETRA data applications today.

## Simple, flexible messaging

TETRA supports a variety of messaging applications: plain text messaging (Short Data Service - SDS): flash text messages that appear on screen immediately; messages that can be sent to a talkgroup or individual radios.

TETRA text messages support useful acknowledgement features to confirm to the control room that a message has been received by the radio, and that it has been displayed to the radio user.

Applications from multiple providers enable photos to be sent with a message (using SDS or WAP (Wireless Application Protocol) push). Also, predefined message templates and support for forms enable quick and easy updates and reporting on the move.

## Real time updates from the field

Many mobile TETRA users provide their control rooms with real-time status updates to indicate when they are on their way to an incident, when they are on-site, or when they are busy or free. TETRA status messages enable easy-to-use, one-button updates from a radio and rapid processing in the control rooms. Status and SDS text messages are standardized to ensure interoperability between all TETRA radios and TETRA networks.

## Fast and effective alerting with standardized 2-way paging

TETRA radios support "callout" which provides alarms and task management information from the control room and acknowledgements from users, similar to 2-way paging. For example, Norwegian Firefighters use TETRA callout to efficiently dispatch operations. Callout is a standardized feature that works across all TETRA radios in the same way. With

callout, control rooms can ensure information is read and acted on quickly. There are also dedicated pager TETRA devices available.

## Location tracking outdoors and indoors

For Public Safety organisations, tracking the location of first responders is a critical safety and operational efficiency requirement. TETRA radios support Global Navigation Satellite Systems (GNSS) to enable location tracking with time and distance triggers to optimize network traffic. Also, the TETRA standard Location Information Protocol (LIP) may be used to ensure efficient location tracking on large TETRA networks with radios from multiple vendors. Location can also be sent automatically when an emergency call starts.

Innovative applications are also available which provide indoor location tracking using Bluetooth beacons. Indoor location can enable Z-axis location - i.e. height and floor information.

## Mobile computer data connectivity

The TETRA PEI (Peripheral Equipment Interface) provides a way to connect computers and other devices with TETRA radios for receiving and sending data. Many first responder vehicles have keypads with physical buttons for status updates, which can easily connect with the PEI port on the vehicle TETRA radio. TETRA can be used as a backup communications option for broadband PC field command applications.

Control rooms and back-end applications can connect directly to the TETRA infrastructure via wireline or for small (i.e. a few dozen users) deployments using a PEI radio.

## Remote control of radio functions

It is possible to remotely control TETRA radio functionality via data messages sent from the control room. SDS or status messages can trigger actions on the radio - e.g. changing the talkgroup or making sure audio volume is on high. TETRA radios have security features to ensure only authorized systems can activate remote control actions. TETRA networks and radios also support over-the-air stun and kill to remotely disable lost or stolen radios.

Where fixed TETRA radios are used in the control room for dispatch operations, the radio devices may be installed in a machine room and remotely controlled over the Local Area Network (LAN) by an application running on PCs on the operators' desks - this ensures more convenient installation and improved security.

## Database access on the move

TETRA SDS messages enable essential database lookups from mobile radio users e.g. a vehicle license plate check — even with your gloves on! The Finnish police and border guard, for example, have access to their databases from TETRA radios to check vehicles and persons in the field. Information is securely always available through the nationwide TETRA network.

## Automating operations

Public Safety automation devices and systems may be connected over TETRA networks via multifunctional automation units. These can provide TETRA status, SDS messages and voice. For example, Finnish fire stations use TETRA to automate actions, including sounding alarms, forwarding voice announcements, alerting pagers, opening fire station doors, and even turning on the sauna when units are returning to the fire station!

## Industrial SCADA over TETRA

Supervisory Control and Data Acquisition (SCADA) solutions are used within the industrial sector to collect, monitor, and automate processes. TETRA offers multiple communication methods ideal for SCADA, from status and SDS messages, to packet data for IP-based protocols. For example, power companies can manage transformer substations, oil and gas companies can detect leaks and control pipeline flow rate and mining operations can monitor heavy machinery. Many power utilities are using TETRA devices to control power stations, photovoltaics, and wind generators and for distributing alarms in real time via SDS, Voice Alarm or Call-Out.

## Combined voice and data for Transport

The same TETRA radio solutions that are providing reliable voice communications for buses, subways, trams, railways and airports can also provide data applications to increase operational efficiency - e.g. location tracking, keeping passenger information displays up to date and accessing operational information from TETRA radios. New Jersey Transit and major airports in the US are using TETRA for voice, location, and other applications to optimize their operations.

## Oil and Gas safety announcements over TETRA

Public announcements (PA) and audio alarms are key to safe operation and communication to workers inside and outside of oil and gas plants. TETRA SDS messages from the control room can trigger RTUs (Remote Terminal Units) to activate sirens and play audio PA messages, to quickly alert everyone in case of gas leak, fire alarm or other incident. In addition to data-enabled alarms, the control room operator can use a group call to specific PA systems to share any important information by voice.

## Convenient smartphone control of TETRA radios

Many users carry a TETRA radio and a smartphone. To simplify operation, an application installed on the smartphone can be used to control the TETRA radio - e.g. change talk groups or perform messaging - via a Bluetooth link. For some users, like covert operatives, this also enables them to communicate over TETRA while appearing to play with their smartphone.

## Lone worker protection

Protection of workers operating alone in potentially hazardous environments is a major concern for many organisations. TETRA radios can detect when the user falls down or remains motionless (“man down”) and automatically send an alert to the control room. The radio can also send user location to the control room or activate an emergency call, so the user in distress can be located and helped quicker. “Man down” combines standard status messages and location report messages for a complete solution.

## Enhancing TETRA radios with data accessories

In addition to audio voice accessories, there are data-enabled accessories for TETRA radios, including Near Field Communications (NFC) readers, indoor location beacon readers, gas sensors, temperature sensors and barcode readers. These accessories can send collected information and alerts over the TETRA network to the control room, using the standard TETRA messaging features. TETRA radios can also connect to on-person sensors thru Bluetooth and monitor e.g. gas in the environment, heart rate or body temperature and alert the control room over TETRA if the situation becomes dangerous.

## Applications integrated within TETRA radios

Some TETRA radios can run native applications on the device itself. Radio apps can provide an easier user interface to customer-specific functionality. Radio apps can also provide additional features on the terminal, for the user or in the background without user interaction. Examples of apps on the radio include indoor location tracking, radio logon, audit and task management. For example, in industrial automation you can run customer specific applications on industrial TETRA devices to monitor and control processes, send out alarms, open doors or switch circuits.

## How to get TETRA data solutions?

Contact your TETRA network provider, radio reseller or manufacturer to learn more about the data applications that could benefit you. TETRA network and radio manufacturers also have partner programs where you can get access to detailed technical specifications and Software Development Kits (SDKs) for application development. Check the manufacturers’ websites for more information. Visit the TCCA website [www.tcca.info](http://www.tcca.info) for more TETRA information.

TETRA solutions deliver exceptional secure and reliable critical voice services but the inherently rich data capabilities of TETRA are often under exploited. The data applications described above are real life examples demonstrating how end users are reaping added organizational value from their TETRA asset investments.

The following leading TETRA application vendors contributed to this article (in alphabetical order): Airbus, Elektro-Arola, ESS, Mentura group, Motorola solutions, PCTEL, Piciorgros, Portalify, PowerTrunk, Sepura and Teltronic.