INTEGRATED **SOLUTIONS** FOR **PUBLIC SAFETY**

Teltronic


POLICE

Teltronic

For 50 years, Teltronic has been dedicated to providing communication solutions that enable public safety and emergency response agencies to perform their duties with the highest levels of efficiency and coordination. Police, fire brigades, ambulance services, rescue services, etc., operate in environments where there is no room for error and require robust and robust communication systems that allow agile and rapid information exchange without interruption.

Whether based on the TETRA, LTE, or 5G technology standards, Teltronic offers the latest state-of-the-art radio communication solutions to meet the voice, data, and video communication needs of any public safety agency, regardless of its size, be it local, regional, or national.

Having worked with public safety agencies all over the world, Teltronic has the experience to understand the needs of the sector. Its technological independence and capacity for innovation have enabled it to evolve its portfolio in line with the end-user requirement and to offer 100% integrated end-to-end solutions including network infrastructure, radio terminals, MCX applications, and control centres.

Our systems provide mission-critical users with the key functionalities for their operations: voice communications and data transmission services, automatic positionsing and vehicle location (AVL), video streaming, and control centre applications for centralised management and coordination. All of this guaranteeing the highest levels of privacy, confidentiality, and information integrity.

NEBULA, MAXIMUM PERFORMANCE AND RELIABILITY

AThe NEBULA infrastructure, on which Teltronic's private systems are built, is the perfect platform for mission-critical users to benefit from the advantages of 4G and 5G broadband technologies.

NEBULA supports a broad ecosystem of applications and new technological developments that enable the shift to a new operating model in which public safety and emergency response agencies respond faster, more efficiently and accurately, and with more information available in real time.

Compared to commercial networks, which have proven to have limitations in their application in critical environments, NEBULA has been designed according to the needs of users and the technological evolution defined by 3GPP to guarantee flawless operation with maximum QoS levels and the lowest latencies to ensure the correct operation of the system.

In terms of availability, coverage levels, redundancy, and fault tolerance, NEBULA provides a genuine response to the needs of critical sectors.

In addition, NEBULA can be deployed in a hybrid LTE+TETRA format, a converged solution built on the components and architecture of the successful NEBULA TETRA infrastructure, enabling easy migration from existing TETRA deployments to broadband-capable networks.

This hybrid network is configured on the basis of proprietary technology, which brings significant strengths:

- High flexibility and customisability due to full control over all of the components that make up the solution.
- Cost efficiency: The use of common elements for both TETRA and LTE nodes and base stations minimises CAPEX and OPEX.
- Simplicity: A single control node and Network Management System (NMS) enables unified management of TETRA and LTE elements and users.

INTEGRATED SOLUTIONS

Teltronic offers comprehensive solutions built on four main elements:

INFRASTRUCTURE

With hundreds of systems worldwide, NEBULA has proven its reliability and robustness. Both in its TETRA version and in its evolution to LTE and 5G, the design of all its elements (control node, management system, and radio access network) is based on the fundamental concepts of professional radio of availability, coverage, redundancy, communications privacy, resilience, scalability, and cybersecurity.

CONTROL CENTRE

Teltronic's Control Centre solution, NG CeCoCo, offers a comprehensive and integrated solution for NG911/NG112 emergency call centres and operations centres, combining call answering, radio and MCX communications dispatching, geolocation and context information management, incident management, and emergency coordination in a single application.

TERMINALS

Teltronic's portfolio includes TETRA terminals, 4G and 5G broadband terminals, and hybrid terminals that seamlessly combine both technologies.

In addition, devices such as personal cameras allow for real-time recording and delivery of video.

MCX APPLICATIONS

Teltronic has developed and complemented its traditional TETRA portfolio with new bandwidth-critical service technologies. MCX services comprise MCPTT voice applications (push-to-talk, group calls, priority management, encryption, etc.), as well as other services such as MCData and MCVideo, while incorporating interworking capability between TETRA and broadband systems.

CENTRAL NODE

The Network Control Node is responsible for providing intelligence to the network, integrating user configuration and access to radio services.

Teltronic offers a series of differentiating functionalities such as, for example, multi-agency capacity, an algorithm for optimising data services, high availability configuration with seamless switchover management, the usability of its network management system, o the scalability of its architecture to adapt to different system sizes.

In addition, for broadband environments, Teltronic has in its portfolio its own LTE control node solution (EPC) and also its counterpart in 5G technology (5GC), both designed according to the functional entities standardised by the 3GPP, and the needs of the sector:

- End-to-end Quality of Service (QoS) guaranteed
- Data integrity and communications security.
- Mobility management and handover.
- Multimedia applications, such as video, for critical scenarios.
- Mission critical services
- Redundant and high availability configurations.
- Scalable and flexible solutions for any network size
- NMS: Integrated Network Management System.

RADIO ACCESS NETWORK

Teltronic incorporates in its portfolio a complete family of base stations available in different formats to offer the best performance in any scenario, both indoors and outdoors. The objective is to maximise the coverage, availability, and reliability of the systems.

Our base stations are designed with industrial-grade components and redundant elements to deliver maximum robustness and withstand the harshest and most unfavourable conditions.

TETRA

SBS, fixed indoor base station

MCBS, multi-carrier base station

4G

Distributed eNB: BBU + RRU

Integrated eNB

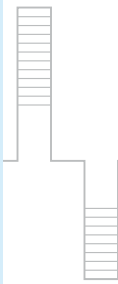
eNB Compact

5G

gNB Distributed: CU / DU + RRU

- pRRU
- RRU Small
- RRU Macro

gNB Integrated



RAPID DEPLOYMENT SOLUTIONS

Rapid deployment solutions provide a flexible and agile response to situations where a reliable communications system needs to be in place in a short time, an already deployed

network needs to be expanded immediately, or damaged equipment needs to be quickly replaced.

They allow to temporarily expand radio coverage, for example in case of an incident or event outside the area covered by the network, or to increase the capacity of a system already in place in the case of an expected increase in traffic.

Whether for TETRA, LTE, or 5G technology, rapid deployment solutions are available in different formats to suit users' communication needs and network operating model:

- Portable tactical cell, carried by one person as a backpack, which can not only be used as a radio for making and receiving calls, but can also create a mobile network.
- Integrated tactical cell, transportable by mechanical means such as a wheeled accessory, in which the EnodeB radio component incorporates an EPC for isolated operation.
- Vehicular tactical cell, which can be installed in cars or vehicles to extend the network quickly and easily.
- A powerful tactical cell, installable in a forward command post, which includes all elements of a network infrastructure, both TETRA and broadband and even hybrid, including central node, base stations, and control centre.

TERMINALS

Teltronic complements its public safety offering with a suite of mobile, portable, and dispatch terminals that provide users with voice, data, and video capabilities for mission-critical environments.

The portfolio includes TETRA, LTE, and 5G terminals, as well as multi-mode TETRA + LTE/5G terminals; a solution that allows the user, through a single device, to have simultaneous availability to both radio accesses.

The compatibility of NEBULA with third-party terminals is ensured through the corresponding interoperability certificates.

BODYCAMS

Teltronic offers its customers a wide range of bodycams, a device that is gaining more and more relevance due to the benefits it provides for safety and transparency of operations. These can record images for later storage or processing, or they can also, under a broadband network, transmit in real time, both to the control centre and to other terminals.

MCX, COMMUNICATIONS CRITICAL WIDEBAND

The term MCX (Mission Critical Services) groups together a number of critical communications applications that offer a set of services over broadband networks to provide voice, data, and video communications.

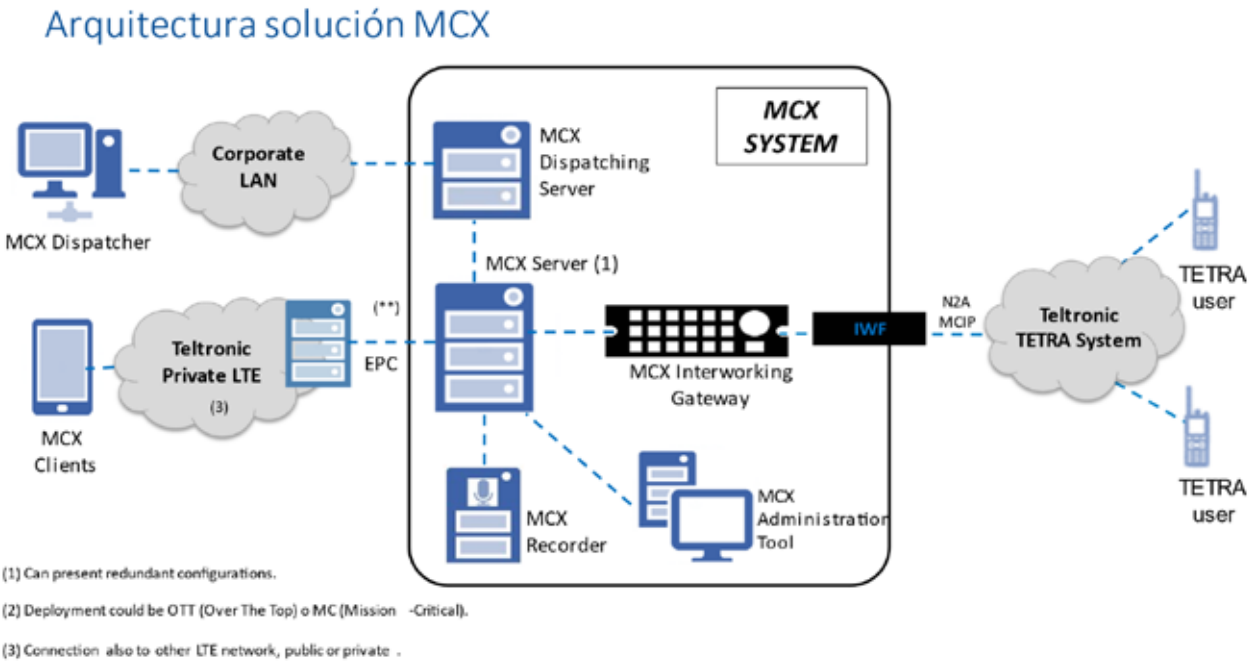
The MCX solution developed by Teltronic is integrated into the design and architecture of the NEBULA LTE/5G private network. The MCX server offers mission critical functionalities and allows different deployment models::

- Complete private network. The MCX solution is part of Teltronic's LTE NEBULA system. This scenario is the most recommended as it offers the possibility to control the entire system, both the radio infrastructure and the MCX system, while ensuring the highest levels of availability and quality of service.
- Radio access from a commercial network. The MCX solution exclusively employs a public 3G/4G/5G/Wi-Fi broadband network as radio access between the MCX client and the MCX server. This type of deployment is recommended for agencies where broadband services are not critical or a priority.
- Hybrid scenarios of private network and commercial network. Mixed scenarios can also be considered, e.g., using the node of a private network and taking advantage of the radio access of a public network.

Teltronic's MCX clients can be installed on Android and iOS smartphones or tablets, rugged professional-use terminals, mobile and desktop radios, as well as computers.

The solution is completed with the IWF (Interworking Function) functionality defined in the 3GPP standard that facilitates integration and interoperability between the broadband MCX system and the NEBULA TETRA system.

The solution is also integrated with the NG CeCoCo control centre, which in its multi-technology and multi-functional design also incorporates MCX dispatcher functionalities.



NG CECOCO: STATE OF THE ART CONTROL CENTRE

NG CeCoCo is Teltronic's control centre solution for dispatching, AVL (Automatic Vehicle Location) for vehicles and personnel, and for incident management. It is configured as a multi-technology platform that centralises the unified management of communications and provides users of 112/911 call centres with all the necessary tools to minimise the reaction time in an emergency.

It allows the integration of different communication technologies, including TETRA or other analogue and digital radio systems, telephony, LTE, MCX, etc., that are managed from a unified user interface for efficient emergency management, enabling fast and secure communications.

The control node can be deployed in multiple locations and with different levels of redundancy to ensure 24×7 operation with availability 99.999% of the time.

FUNCTIONALITIES

Console station with flexible configuration and touch-screen operation

Call dispatching adapted to multi-agency operation and according to profiles

Communications management over multi-technology networks

Access to services such as video over public and private broadband cellular networks

Geolocation services integrated with call dispatching

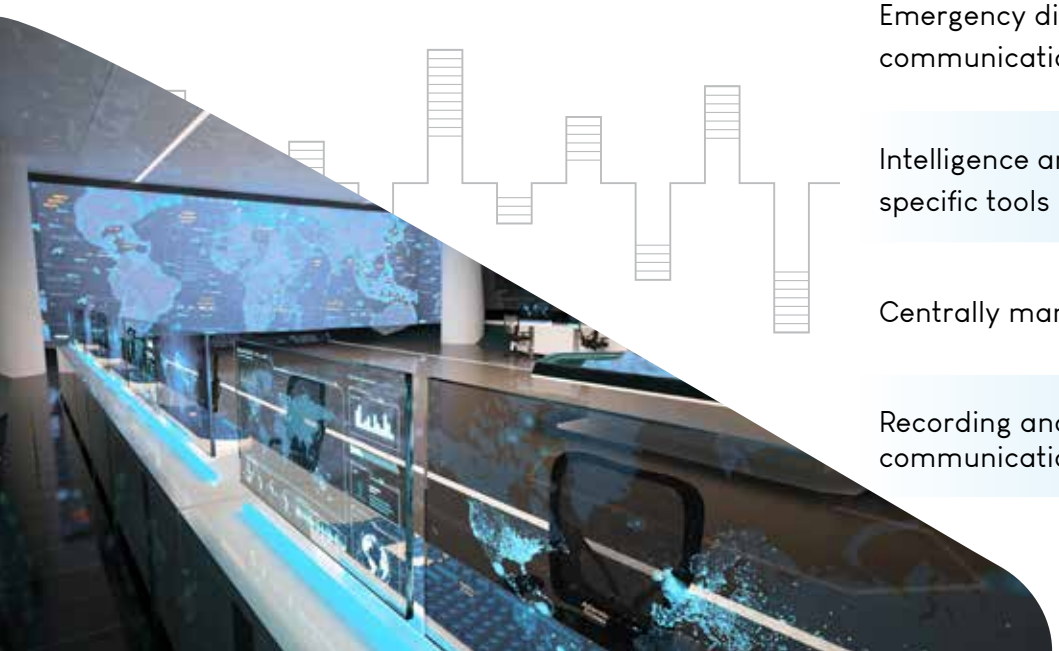
Interaction with the environment through C2A, a series of open interfaces and protocols for the exchange of location information, alarms, or events

Emergency dispatch integrated with communications management

Intelligence and data processing through specific tools

Centrally manageable web-based solution

Recording and logging of voice and data communications



MODULAR

- Flexible SW licensing scheme to enable the modules and control centre functionality to suit each customer's requirements: CAD, AVL, incident management, 112/911, recording, etc.

SCALABLE

- Virtualised and multi-client server topology
- Scalable HW architecture
- Growth according to customer needs

CONFIGURABLE

- Custom configuration for special customer requirements
- Individualised configuration of permissions and accessible functionality
- Ad-hoc integrations

FLEXIBLE

- Configurable graphical interface and functionality
- Operators are not associated with a fixed position
- Graphical view, permissions, and accessible functionality configured based on login identity

RELIABILITY

- Configurations to provide 24x7x365 operation
- Maximum availability through redundancies avoiding single points of failure
- Cybersecurity protection measures

INTEROPERABLE

- Integration with different radio infrastructures and technologies and communications networks
- Functionalities for mission-critical communications
- API for access from external third-party applications

OPEN

- Complete IP solution.
- Native standard technologies: SIP, IP, SNMP

SOME KEY ISSUES FOR PUBLIC SAFETY AND EMERGENCIES

BROADBAND APPLICATIONS

The erruption of broadband technologies enables the massive exchange of data, giving rise to a new ecosystem of tools to improve the efficiency and safety of operations for public safety and emergency response agencies including monitoring of sensors (fixed and personal), high-precision location, database consultation, maps, real-time video analysis, and artificial intelligence applications that allow correlating incidents, behaviours and trends, etc.

The application of concepts such as IoT, AI, or Big Data makes it possible to incorporate new multimedia sources of information and detect the risks that may appear in different situations, improving the decision-making process to the maximum.

CYBERSECURITY

Teltronic is concerned with providing end-to-end cybersecurity for the solutions deployed. In line with a defense-in-depth strategy, it implements a set of controls such as bastioning, segmentation, access control, intrusion detection, endpoint protection, etc., which, together with a limited set of services, guarantee the secure lifecycle of its products and systems.

SDM

Teltronic's patented Synchronous Data Manager (SDM) system optimises data transmission in TETRA networks by minimising the number of channels that would be required to transmit the same amount of data in a given time. This allows users to have a real-time location service without interrupting the voice operation of the network, being able to refresh the position of more than a thousand devices in as little as 20 seconds.

AUTHENTICATION AND ENCRYPTION

The NEBULA system supports different types of authentication (infrastructure-initiated mobile authentication and infrastructure-initiated mutual authentication), always included in the terminal registration procedure. Furthermore, the integrity of communications is protected by over-the-air encryption, which consists of a transformation of the data (or part of it) circulating over the air so that unauthorised users cannot access it, and by end-to-end encryption that allows the information exchanged between the caller and the called party to be protected from the beginning to the end of the transmission path.

INTERFACE FOR IOT SOLUTIONS

TETRA and LTE technologies can be used as a communication medium for Internet of Things (IoT) applications. NEBULA offers a specific interface (IoT gateway) to facilitate the development and implementation of such applications in critical environments. Data obtained from personal devices or accessories, environmental sensors, etc., are sent through NEBULA and received either in Teltronic's control centre, CeCoCo, or in other standard Cloud platforms for further processing.

VIDEO SOLUTIONS

Video in mobility and integration with CCTV systems is a growing need in critical environments. Teltronic's solutions allow real-time video transmission from fixed cameras, mobile terminals and bodycams, and even from drones; an image that can be received both in other terminals and in the control centre. Their integration with AI platforms multiplies the capabilities of the video services, incorporating automatic identification services of people or number plate numbers, autonomous detection of vandalism, etc.

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ARGENTINA
- National Gendarmerie (GNA)
- Entre Ríos Regional Government
- Neuquén Regional Government
- Federal Police (PFA)

BERMUDA
- Government of Bermuda

BOTSWANA
- Botswana Police

BRAZIL
- Natal Airport
- Brasilia Airport
- State of Acre
- State of Amapá
- State of Bahia (SSP)
- State of Ceará
- State of Espírito Santo
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- State of Santa Catarina
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- Secretariat of Security, RJ

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OMAN
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PERU
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- Municipality of Madre de Dios
- Municipality of Pucallpa
- Municipality of Trujillo

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- Kalibo Airport
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- Tshwane Metropolitan Municipality

SOUTH KOREA
- Incheon Police

SPAIN
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- Granada City Council
- Firefighters Catalonia
- Government of Aragon
- Government of the Balearic Islands
- Government of Catalonia RESCAT
- Canary Islands Government RESCAN
- Ceuta Regional Government
- Basque Government ITELAZPI
- Junta de Andalucía
- Zaragoza Police

UNITED STATES
- Newark Liberty International Airport
- Los Angeles Airport
- San Francisco Airport
- JFK Airport

UZBEKISTAN
- Public Safety Network

Teltronic

Teltronic

P.L. Malpica C/ F Oeste5
0016, Zaragoza > **SPAIN**

T.: +34 976465656
sales@teltronic.es

PowerTrunk

66 York St
07302, Jersey City > **NJ · USA**

T.: +1 (201) 630 4520
sales@powertrunk.com

Teltronic Mexico

C/ Rubén Darío 13
2ª planta Colonia Anzures
Delegación Miguel Hidalgo
11580, CDMX > **MEXICO**

T.: +52 (55) 52541113
mexico@teltronic.es
administracionmexico@teltronic.es

Teltronic Andina

Edificion Centro Ejecutivo II
C/ 81 11-68Oficinas 413-414
Bogota D.C. > **COLOMBIA**

T.: +57 1 622 2237
T.: +57 1 618 0639
colombia@teltronic.es

Teltronic Brasil

Rua Butantã, 461 Conj. 91-92
9º andar - Edificio Butantã
Pinheros, 05424-140
São Paulo / SP > **BRASIL**

T.: +55 11 5093 7686
brasil@teltronic.es

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www.teltronic.es