COMTAG®

Communication Tactical Gateway

Tactical communications on the move

ALITER TECHNOLOGIES

DESIGNATION

COMTAG® of the third generation is a family of devices for a software-defined, vehicular, tactical communication intercom suitable for any situation that calls for a reliable voice and a data communication with an interface that is user-friendly and comfortable.

COMTAG® is a universal solution for the needs of interconnecting the crew members and devices, as well as for accessing the vehicle's radio communication means in order to connect with other vehicles, command posts or crews outside of the vehicle.

ARCHITECTURE – MODULARITY AND SCALABILITY

The **COMTAG®** modular concept is based on a central unit that connects to the crew's user terminals. The central unit is also connected to various external communication sources, including tactical radios, mobile networks and alert detectors.

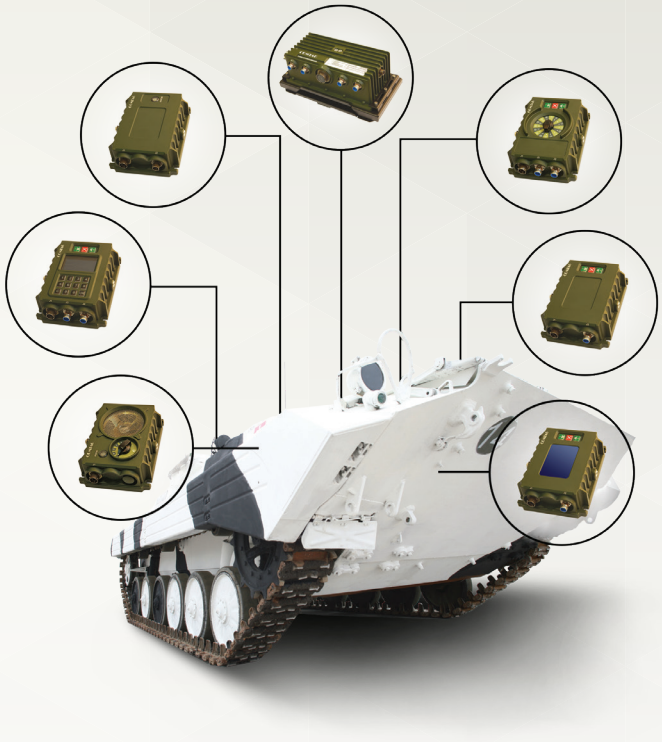
The link between the central unit and the user terminals is implemented through simple, low maintenance cabling following the star topology, making it possible to connect to the tank turret via a moving commutator. With partial modernization, it is possible to utilize the original intercom wiring to your advantage.

The **COMTAG®** modularity is realized primarily through tailoring its individual components to specific user requirements.

The primary **COMTAG®** division includes:
- A basic voice and data component
- An extended voice and data component

The **COMTAG®** modular architecture enables integration from light vehicles all the way to the complex environments of mobile command posts with lots of desired functions. Modularity allows for resource savings while leaving room for future additions and extensions of the system. The functionality of a given configuration is determined by the software settings of the intercom's central unit, which can be modified at any time according to updated requirements without the need to replace the **COMTAG®** components or interfere with the physical installation of the system.

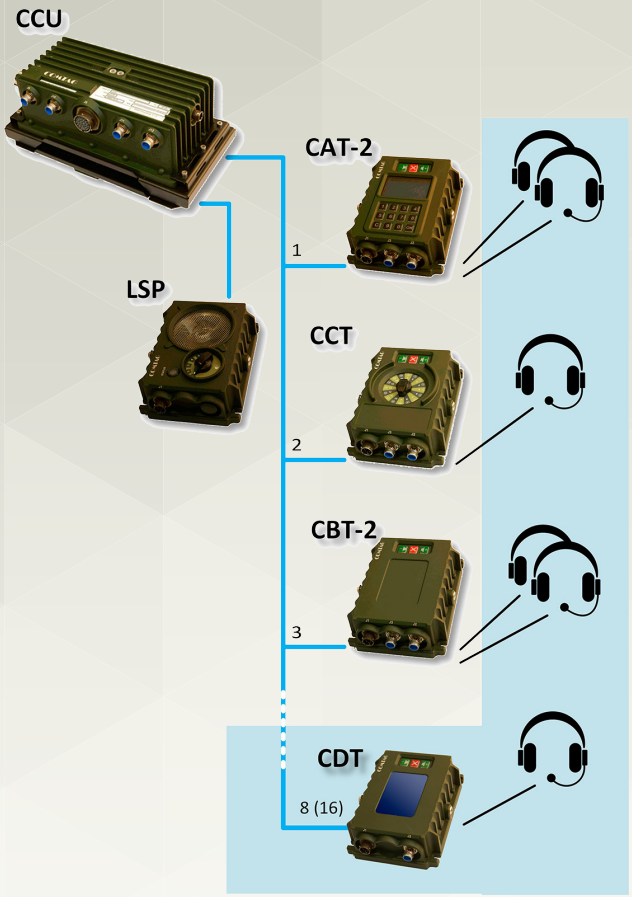
The **COMTAG®** module's design emphasizes minimal size, low weight and low power consumption.



VOICE SERVICES – INTERNAL NETWORK

COMTAG® offers a wide spectrum of high-quality digital voice services even in its simplest configuration.

The central control unit (**CCU**) together with up to eight crew terminals constitute the core of the intercom's voice network. If more than 8 user terminals are required, it is possible to double this number by adding another **CCU**.



The voice terminals can be made up from 4 different types:

- **CAT** commander advanced terminal with a keypad and display
- **CCT** commander control terminal with a dial switch
- **CBT** crew basic terminal
- **CDT** crew display terminal

All user terminals exist in variants for one or two connected audio users, or in combination with a data or alarm indicator interface. The user interface is fully customizable for all commonly used military headsets. It is possible to use simple headsets in combination with throat mics, modern passive headsets as well as active noise reduction headsets (ANR).

In special circumstances it is possible to place any user terminal within 1,200 m of the **CCU**'s location.

It is possible to use the **CAT** keypad to change presets, power and remotely control additional selected radio station parameters.

The loudspeaker (**LSP**) module with a speaker enables the monitoring of single or multiple communication channels within or even outside of the vehicle.

VOICE SERVICES – EXTERNAL CONNECTIONS

COMTAG® provides an interface for various external voice communication channels for vehicles and mobile centers, both analog and digital.

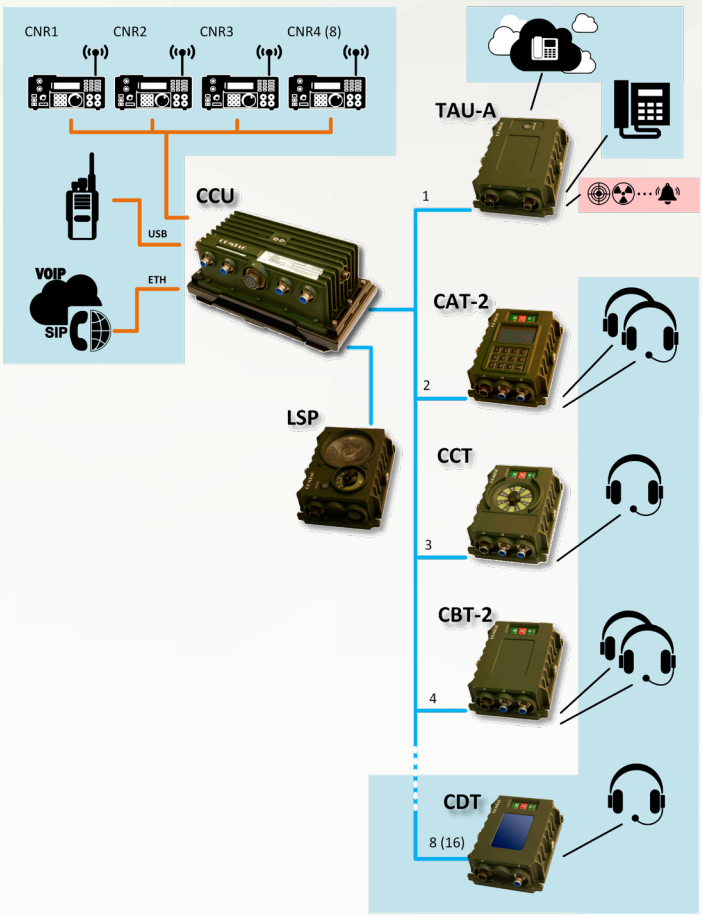
It is possible to connect the **CCU** with up to 4 external devices through its audio interface. These would most commonly be tactical radio stations, but it is also possible to connect any wireless voice device with half- or full-duplex operation such as SATCOM, Tetra and others.

External radio channels are patched through to designated user terminals or crew groups. The current direction can be modified through the terminals with a preset configurations selection function. Access to half-duplex broadcasts can be controlled with priority settings for individual crew members or exclusively through the commander terminal. The combinations of software settings of the internal network or external connections are only limited by the specific configuration of the **COMTAG®** intercom.

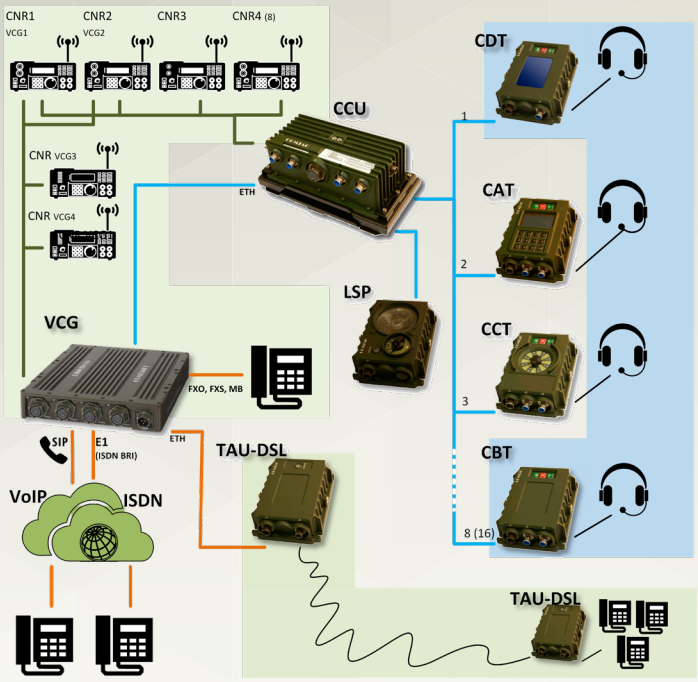
The telephone access unit (**TAU**) contains 2 interfaces, through which the system can be connected to any external telephone network as a terminal station. It is possible to connect two central battery (CB) or local battery (LB) field telephones as additional users. The unit can also be equipped with an alert indication interface.

The **CCU** supports connections to IP telephone networks with SIP signaling and USB voice connections with compatible CNR radio stations.

The system can create automatic retranslation of any external voice channels.



VOICE SERVICES – VOICE COMMUNICATION GATEWAY ACCESS



A specific instance of voice services is the use of the voice communication gateway (VCG). Its deployment creates a brand-new way of utilizing **COMTAG®** resources, especially tactical radio stations. A mobile vehicular platform connected to the external network with VoIP services can become a gateway that connects these services to selected radio networks. The connection is technologically implemented either through a direct network connection, or alternatively through one of the ISDN BRI and E1 connections. **VCG** contains integrated VoIP connection services based on the SIP protocol with simple configuration.

In addition to connecting voice services to CNR radio stations, **VCG** also enables the remote control and setup of some of the radio stations' parameters from any location over the phone.

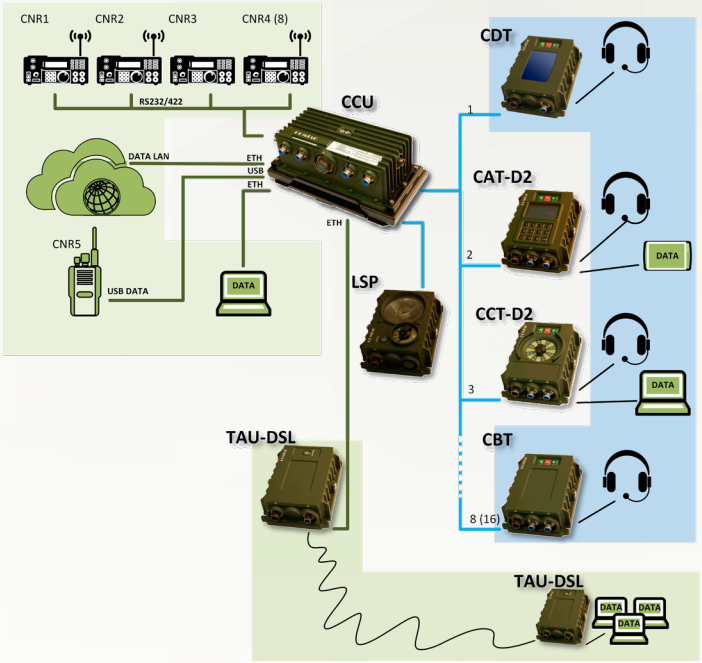
The voice services are autonomous, transmissions from external phone networks are automatically routed to the radio network according to its configuration. Outgoing calls are managed by the caller through the DTMF settings on the radio station. In case of radio stations without these capabilities, the transmission is routed to the operator's telephone.

BASIC DATA SERVICES

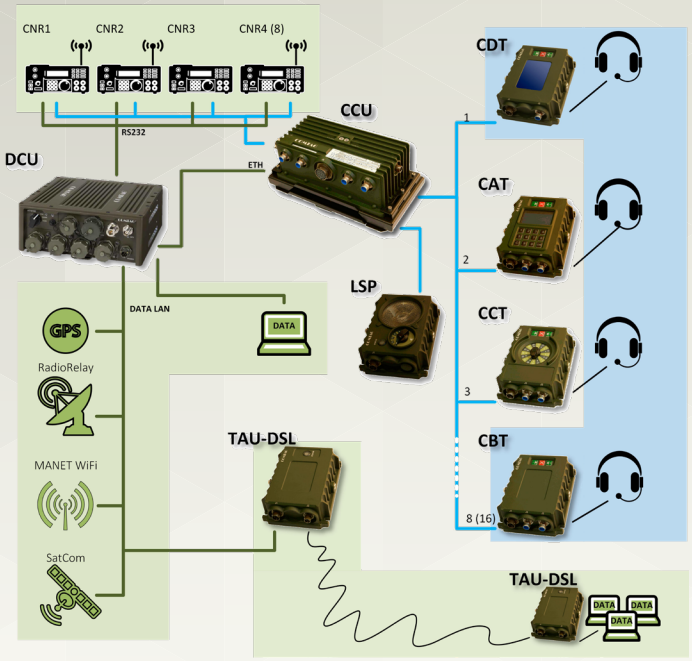
COMTAG® without added data modules is capable of connecting the **CCU** module to 4 external data channels through RS232/485/422 serial interfaces. 2 ethernet interfaces and 2 USB interfaces are also available. Data is transmitted via the selected terminal equipped with a serial interface for a connected end device. It is possible to create a data channel from the terminal to an external device, or between two end devices.

A special variant of the **TAU-DSL** terminal enables the creation of a 5.7 Mbps data connection via a field two pair link over the distance of up to 1,200 m. Each end of the connection contains 4 ethernet interfaces.

Data connections reduce the terminal's need for voice, to one user per terminal. The version of the terminal for alert inputs also enables one voice connection. The same holds true when connecting alert detectors to the terminal through a compatible setup.



EXTENDED DATA SERVICES – USING THE DATA COMMUNICATION GATEWAY



A **DCU** is the central control switchboard and gateway into the external environment, which allows the creation of MANET mobile ad-hoc dynamic networks on narrowband radio networks.

The basic data channel is usually the serial or ethernet interface of the linked radio stations. The **DCU** contains an internal modem, for when the radio stations do not have a data transfer capability.

On a radio network with narrow bandwidth the **DCU** uses a proprietary transmission protocol to improve the transmission efficiency.

The **DCU** contains its own Wi-Fi module that can be used as an alternative or supplementary means of data transfer. It is possible to preconfigure this fast channel as the default option.

The transferred data can be encrypted by an internal crypto module with the option to load encryption keys through a designated connector or remotely through its central software.

The **DCU** contains a GPS module and can provide coordinates to other systems within the vehicle, or transmit them independently to remote, automated C2 systems.

EXTENDED DATA SERVICES – USING A MOBILE ROUTER

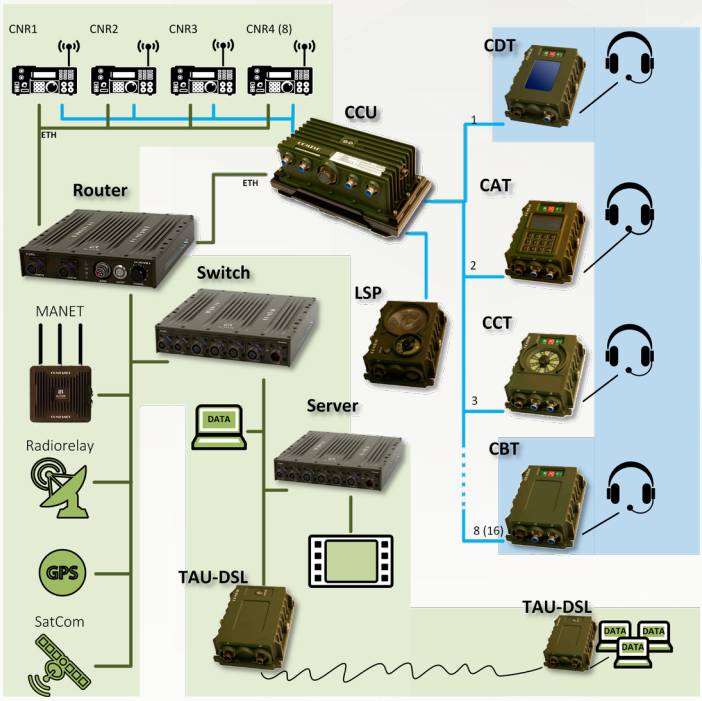
The **mobile router** is meant for data transfers to cutting-edge digital devices that can be connected through the ethernet network interface.

Using tactical SDR CNR radio stations or specialized broadband radio means with high transmission speed requires a high-performance data transfer control solution. A vehicular router offers many scalable network services including common routing protocols, firewall, hardware encryption, VPN, VoIP CUCME connection services and others.

The **mobile router** allows for a direct connection of multiple data devices or a connection to the extended network of the mobile vehicular platform.

The extension of a local network in a mobile vehicular platform is possible thanks to a **mobile switch**. Other than increasing the number of connectible devices, it also brings VLAN, QoS, authentication, SNMP and other services.

By supplementing the configuration with a powerful **mobile server**, it is possible to create a complex, open data environment for the deployment of automated C2 systems.



BASIC FEATURES

- Connection of up to 8 voice terminals (16 with two CCUs)
- Connection of up to 4 (8) transmission devices (radio stations, SATCOM, etc.) via serial interfaces
- Connection of modern radio stations via ethernet or USB interfaces
- Serial connection of radio stations via RS232 PPP protocol
- Software-controlled configuration, voice notifications and messages
- Simple to use
- Broad range of voice component functions (conferencing, point-to-point communication, priority, speakerphone, etc.)
- Monitoring and control of selected radio station parameters
- Digital voice PCM 64 kbps communication
- Connection of up to 4 data devices supporting RS232 up to 920 kbps without supplemental units
- Connection of up to 4 RS232 devices (with DCU unit) and up to 5 data devices via ethernet interface
- Adaptive noise reduction on all audio channels
- Connection of high-speed data devices via ethernet using a router
- Connection to VoIP networks
- Connection to external analog CB/LB networks
- Use of headsets with ANR
- Remote access to the voice functions out of the vehicle to a maximal distance of 1,200 m
- Speakerphones for crew members without headsets
- Distribution of voice messages from external alarms
- Optical status indication
- Simple, low-maintenance cabling
- Central power supply for all components including headsets
- Mechanical, electrical and climate resistance for the environment of combat vehicles
- Low electromagnetic radiation levels

WORKING CONDITIONS

Operating temperature:	-32°C – +55°C	MIL-STD 810F (G), for wheeled and tracked vehicles
Storage temperature:	-50°C - +70°C	MIL-STD 810F (G), for wheeled and tracked vehicles
Climate resistance:	98% humidity at 25°C, IP 67	MIL-STD 810C, STANAG 2895, ed. 1. cat. A3, C1
Mechanical resistance:	Vibrations/impacts – 5G/20G	MIL-STD 810F (G), for wheeled and tracked vehicles
EMC:	Emission/resistance	MIL-STD 461E

TECHNICAL SPECIFICATIONS – BASIC VOICE AND DATA COMPONENT

The CCU Central control unit

is a unit for switching voice and data.

Interfaces

- 1 x 8 crew terminals with power supply (or 7+1 for connecting a secondary CCU)
- 4 x RS232 and the control for connected radio stations
- 2 x Ethernet + 2 x USB data/voice
- 4 x RS232 (422/485) data
- 1 x loudspeaker
- 1 x power supply

The CAT commander advanced terminal

with a display and a keypad, which allows for the setting up of selected radio parameters.
Customizable alerts and data.

Interfaces

- 1 x headset
- 1 x connector for linking to CCU
- + A customizable one of the following:
  - 1 x headset
  - 1 x serial RS232/RS422
  - 1 x alarm

The CCT commander control terminal

with a dial switch, allows for a selection, from 12 presets. Customizable alerts and data.

Interfaces

- 1 x headset
- 1 x connector for linking to CCU
- + A customizable one of the following
  - 1 x headset
  - 1 x serial RS232/RS422
  - 1 x alarm

The CBT Crew basic terminal

with basic functionality settings, using 3 buttons. Customizable alerts and data.

Interfaces

- 1 x headset
- 1 x connector for linking to CCU
- + A customizable one of the following:
  - 1 x headset
  - 1 x serial RS232/RS422
  - 1x alarm

The CDT Crew display terminal

with basic functionality and a screen for displaying a message interface. Customizable alerts.

Interfaces

- 1 x headset
- 1 x connector for linking to CCU
- + A customizable alarm

The LSP Loudspeaker

with speaker volume control.

Interfaces

- 1 x connector for linking to CCU and local power supply

The TAU Telephone access unit

is an interface for telephone networks and alerts. Customizable alerts or HDSL modem version.

Interfaces

- 1 x connector for linking to CCU
- 1 x connector for lining telephones
- + A customizable alert
- TAU-DSL 4 x ethernet, 1 x HDSL modem

Technical specifications of the Extended voice and data component devices are provided in individual product descriptions for these devices.

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