

AT10102 DCU DATA CONTROL UNIT

Background

Achieving the fast-paced, agile and efficient combat results of military operations depends on the effective interconnection of all entities in the field of combat/operation through robust, resistant and durable communication networks. The dynamics of combat activities demand radio and data communication technologies and networks, which do not restrict them, but rather help them to increase their agility, adaptability and flexibility. Such capabilities are ensured by the dynamic unmanned routing of the applications of the command and control system in self-synchronized configurable narrow and wideband mobile ad-hoc radio networks known as MANET. To fully benefit from all of the above mentioned, the data system should be well optimized for a wide range of radios from various vendors including legacy analog ones as well.

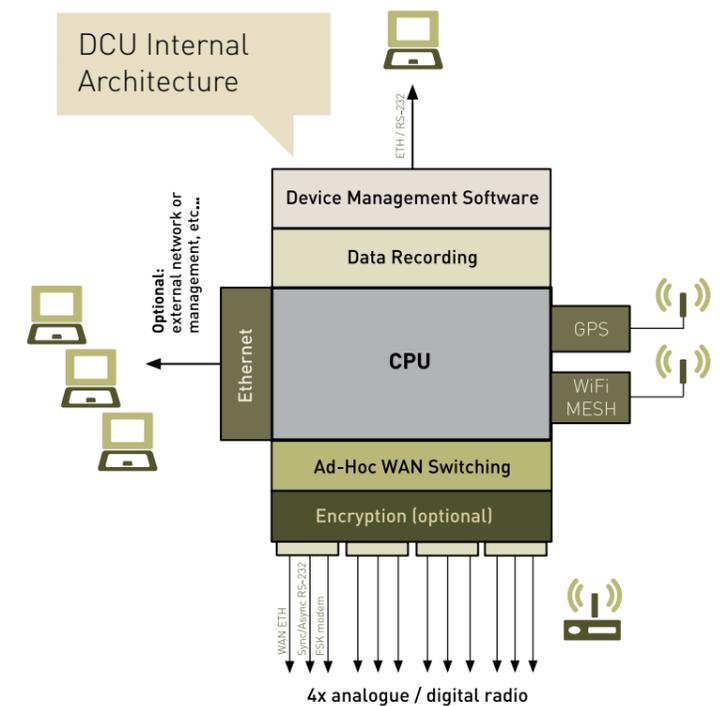


Role of DCU

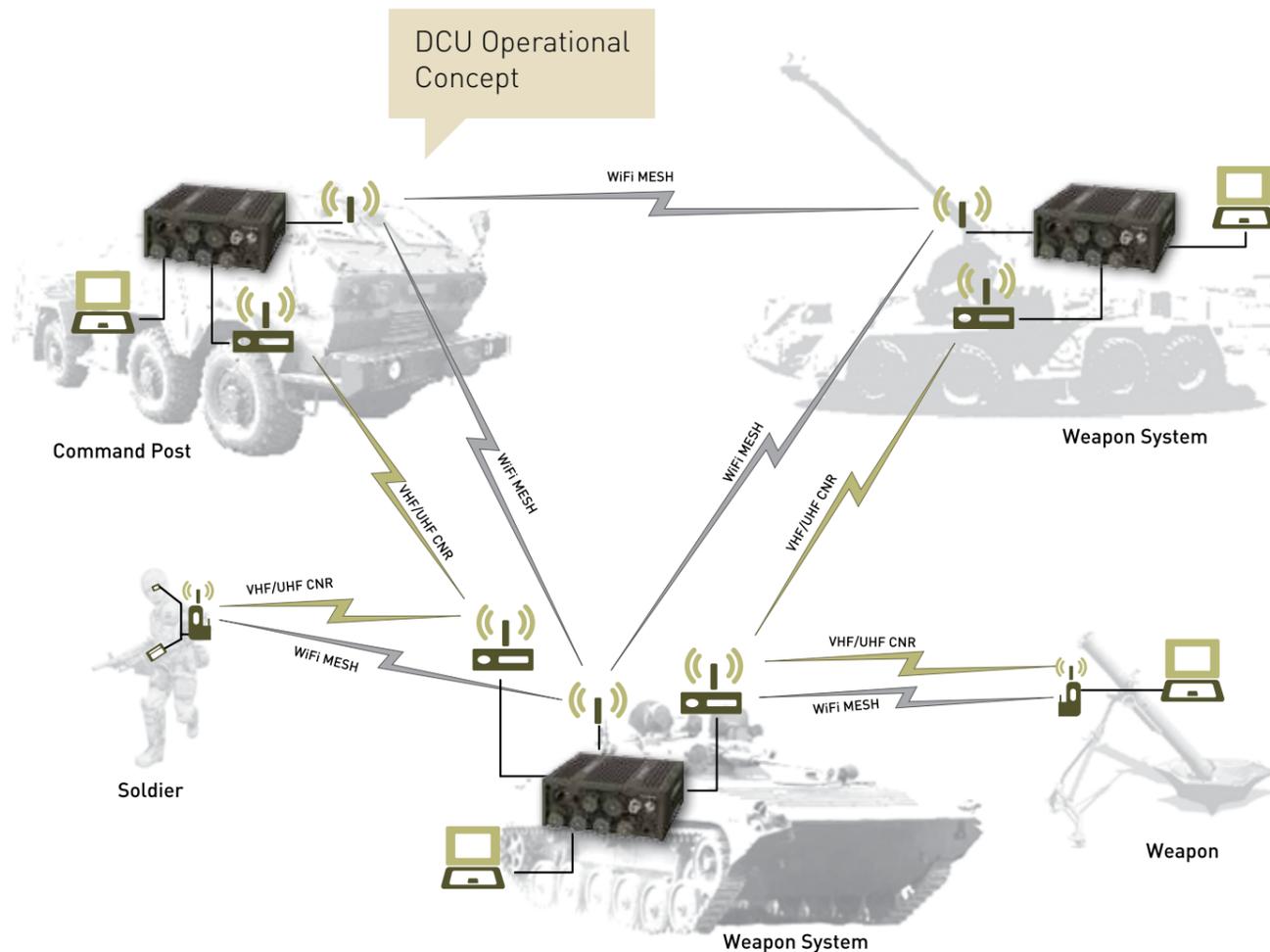
The role is to provide an automatic unmanned transmission communication environment for the applications of the command and control system with automatic routing of the data, efficiently balancing and valorizing all available optical, metallic and wireless carriers.

DCU integrates some elements of the network communication infrastructure:

1. Local area network LAN
2. Ad-Hoc WAN switch
3. WiFi MESH
4. GPS
5. Modem
6. Internal crypto device
7. Data communication recording device



DCU is designed based on the rugged COTS and MOTS hardware technologies for use under demanding climatic conditions fulfilling the MIL STD standards. The proprietary operating system of the device ensures the steady and reliable processing of the data integrating many useful modules into one integrated device. DCU is a software defined device which can be easily reconfigured. It is designed to work with all types of radios based on customer requirements, or even according to the evolutionary development of tactical radio communications. Through the simple application of updating the firmware the device is able to partly or completely change the concept of its use. DCU is based upon the principle of an open ISO OSI model, which allows the customer to scale and modify the services of the overall system for which the DCU is being used as a NEC data enabler.



DCU Functionalities

Local area network (LAN) offers basic local data 10/100 Mbps IP services for 5 local users without the need to procure other additional hardware. The Open Systems Interconnection model of the architecture guarantees arbitrary scalability.

Ad-Hoc WAN switch automatically switches the local area data network as well as the DCU components with all available external wide area networks WAN by using the predefined communication interfaces:

- 4 x WAN ETH
- 4 x Synchro/Asynchro Serial RS-232
- 4 x FSK MODEM

WiFi MESH module enables 4 WiFi functionalities in one device. It can be used as a point of MESH network, Ethernet bridge, repeater or as an access point with an up to 300 Mbps radio bit rate throughput using the 2,4/5 GHz band according to IEEE 802.11 n a/b/g with defined QoS. The WiFi MESH module enables automatic adjustment of RF output power according to the current tactical situation with orthogonal frequency-division multiplexing. The wireless transmission security is ensured by 64/128 bits WEP, WPA-PSK, WPA2-PSK, IEEE 802.1x (centralized RADIUS authenticator & supplicant), SSID broadcast control and MAC addresses filtering.

The GPS module contains a hybrid GPS/SBAS engine with anti-jamming technology, which is able to navigate down to -162 dBm and -148 dBm with coldstart, supporting also present and future GPS systems. After implementing the newest version of the firmware the module will even be able to work with the newest GPS systems such as GALILEO and GLONASS.

The Modem modulates and demodulates an analog carrier signal to encode digital information using FSK modulation. The modem establishes the automatic data connection over the legacy analog radio networks.

The Internal crypto device offers standard AES-256 encryption for the transmitted data with optional keys' upload from an external source.

The Data communication recording device archives transmitted and processed data from the DCU device for up to 30 days. These data are available for further processing such as demonstration or training.

Summary

The DCU delivers the ability to form mobile Ad-hoc networks MANET. It provides a physical, data link and network data transmission layers for vehicular workstations using a communication environment created by HF/VHF/UHF radios, WiFi devices, Ethernet

cables, and satellite terminals, etc. The DCU provides dynamic, unmanned routing of command and control system application data, selecting the communication channel with the highest available transfer rate.