



# CREATING A LANDMINE-FREE WORLD WITH ARIADNA

## HIGHLIGHTS

- ✔ [KoNaR](#) is a student robotics interest group at the Department of Cybernetics and Robotics of Wrocław University of Science and Technology. It takes part in international projects covering robot construction and control, artificial intelligence, and embedded systems.
- ✔ In order to compete in the [Minesweepers](#) international robotic competition on humanitarian demining, KoNaR designed the Ariadna autonomous pyrotechnic robot. However, this robot needed a way to establish reliable communication with its command center.
- ✔ Coming to the rescue was a pair of our RUT241 industrial cellular routers, with their compact size and easy-to-install nature playing key roles in this solution.

## THE CHALLENGE – A REAL-LIFE VERSION OF MINESWEEPER

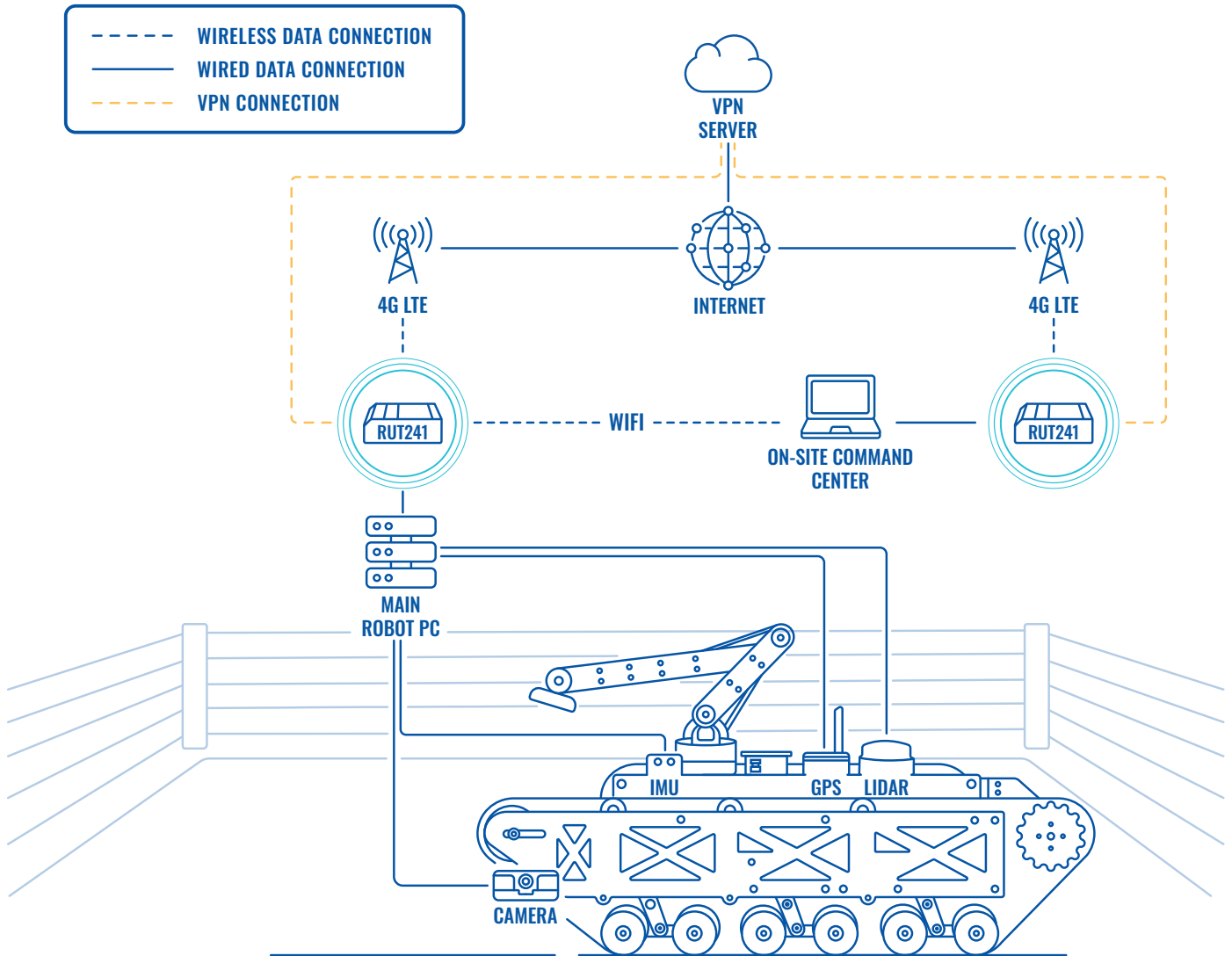
There are an estimated 110 million land mines in the ground at this very moment, killing or maiming over 5000 people annually. Demining efforts are being made, of course, but each mine costs \$3-30 to make and \$300-1000 to remove, while more of them are being planted than removed each year.

A solution to this problem must, by the nature of how dangerous demining can be, involve the use of robots. To that end, many robotics developers compete in the Minesweepers international robotic competition on humanitarian demining. KoNaR is one of those competitors, inspired by the concise mission statement of the Institute of Electrical and Electronics Engineers: "to foster technological innovation and excellence for the benefit of humanity."

KoNaR's creation was the Ariadna autonomous pyrotechnic robot, capable of detecting mines, avoiding collision with obstacles, carrying cargo, and returning to its base of operations. A suite of modern sensors, including LIDAR, GPS, IMU, and Depth Camera, allow Ariadna to take on demining missions.

But as any autonomous robot developer can tell you, autonomy doesn't mean much if communication between robot and operator, as well as optional remote control, aren't also part of the package. Basically, KoNaR needed a way to establish reliable communication with Ariadna as it set out to the wilderness in search of life-threatening mines.

# TOPOLOGY



## THE SOLUTION – SWEET CHILD O’ MINE

The students at KoNaR asked the group’s graduates for advice on connectivity devices with proven success in robotics use cases. The graduates, naturally, recommended Teltonika Networks. A pair of our RUT241 industrial cellular routers were chosen to be implemented – one in Ariadna’s PC, connected via an Ethernet cable, and another in the command center.

This setup of two routers provides a superb, steady connection performance bolstered by a dedicated VPN service, and allows the command center to have full control over Ariadna using Wi-Fi. This is all in spite of the adverse environmental conditions and long distances covered by the robot in its routine demining missions.

In addition, as Ariadna is already packed with devices – space is at a premium. Key features of the RUT241 in this solution are therefore its compact size and easy-to-install nature, which succeed in establishing stable network connectivity at no cost to setup complexity.

