WHITE PAPER

CONNECTIVITY IN COUNTER-UAS SYSTEMS

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fischer CONNECTORS

Part of Conextivity Group

INTRODUCTION

THE GROWING ROLE OF CONNECTIVITY IN DETECTION, DEFEAT, AND COMMAND AND CONTROL

Counter-UAS, or C-UAS, is one of the fastest-growing categories in defense electronics. Published estimates of the global market vary widely, from roughly $8 billion to $14 billion in 2026 depending on how the category is scoped, with most forecasts clustering around 18 to 25 percent annual growth into the early 2030s. What the estimates agree on is direction: spending is accelerating fast enough that the U.S. Army alone awarded a single ten-year enterprise contract with a strong counter-UAS interoperability mandate worth $20 billion in March 2026, and the Pentagon's FY2027 budget request for its new Defense Autonomous Warfare Group jumped from $225.9 million to $54.6 billion in one year.

As that investment turns into fielded systems, C-UAS hardware is evolving fast in two directions at once. It's getting smaller and more distributed, moving from vehicle- and ground-based systems down to handheld and even weapon-mounted gear. And it's getting networked, moving from standalone jammers and radar boxes toward integrated architectures that tie sensors, command software, and countermeasure systems together. Both trends put greater demands on the connectors, cables, and electronics that move power, signal, and data between components. In a system this dense and this size-constrained, that layer is no longer a commodity part. It's an engineering decision with direct consequences for whether the mission succeeds.

This paper looks at connectivity in C-UAS through systems where Fischer Connectors products are already fielded or in development, across detection, jamming, and kinetic defeat, and across vehicle, soldier, and munition platforms. It also points to an opening tied to the U.S. Army's NGC2 program: a gap for the connectivity layer — hubs, connectors, and cable assemblies — that integrates soldier-worn data, communications, and mission systems at the tactical edge.

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WHAT THREATS CREATED THIS MARKET

Air defense systems built over the last several decades were designed to track and intercept aircraft and missiles: fast, expensive, relatively rare targets. The threat that emerged over the past few years is the opposite profile. Commercial and modified quadcopters and fixed-wing drones, some costing a few hundred dollars, are being used for reconnaissance, artillery spotting, and direct strikes at a volume no legacy air defense system was built to handle.

The war in Ukraine has been the primary proving ground. Both sides have used small drones at a scale that turned counter-drone capability into a daily survival requirement for frontline units, not a specialized add-on. The response has been a new equipment category built specifically for this threat: layered systems that detect, track, identify, and defeat small drones using radar, RF sensing, electro-optical and infrared tracking, jamming, and kinetic or directed-energy interceptors, tied together by command-and-control software.

C-UAS TRENDS

Several trends are shaping the evolution of C-UAS systems. RF jamming remains a common counter-drone technique, but its effectiveness is increasingly challenged by autonomous navigation, fiber-optic control links, satellite communications, and other counter-countermeasure technologies. As a result, many operators are moving toward layered defenses that combine sensing, electronic warfare, and kinetic defeat mechanisms rather than relying on jamming alone.

As fiber-optic and autonomous-navigation drones increasingly defeat jamming, defenses are shifting toward physical countermeasures. There are secondhand reports from Ukraine of jam-resistant, fiber-tethered attack drones being defeated by physically severing the tether cable rather than through electronic disruption. Gun-based defenses, often compared to scaled-down close-in weapon system (CIWS) concepts, are a related lower-cost option for defeating large numbers of drones at close range. This has become increasingly important as missile interceptors, while highly effective, can become economically difficult to scale against swarm attacks.

No single countermeasure is sufficient against a sophisticated drone threat. The market is increasingly moving toward layered defense architectures that integrate sensing, electronic warfare, kinetic intercept, and gun-based countermeasure systems into a coordinated system. That trend reinforces the importance of open architectures and connectivity: layered defense only works when the different sensors and effectors can exchange data and operate as a unified network.

WHY CONNECTIVITY MATTERS

As more C-UAS systems get fielded, each one packs in more sensors and more processing power to keep up with the data those sensors produce, three pressures build at the same time.

1. Systems get smaller and SWaP becomes the binding constraint on anything that must fly or be carried.
2. Platforms get more interconnected, routing power, signal, and data between more components than they used to.
3. Each connection carries more mission risk: in a kinetic system, a single point of failure doesn't just degrade performance, it can take the whole engagement down.

Connectivity sits directly underneath all three pressures. It's the layer that has to keep working while everything around it shrinks and the stakes per connection go up. And it's a layer that's easy to treat as an afterthought, because it only shows up as a problem after the system is built and something fails in the field.

WHAT EACH C-UAS DEPLOYMENT TYPE NEEDS

C-UAS hardware isn't one category of connectivity requirement. It's at least four, and they pull in different directions.

Deployment Type	Primary Connectivity Challenge	Why
Vehicle-mounted systems	Reliable sealing and mating through mud, cold, and repeated use in palletized or mobile setups	Units move between vehicles or get reused across palletized setups; a connector that fails after a few cycles isn't viable
Soldier-worn or handheld systems	Multiple worn devices, one soldier, no room for point-to-point cabling	Soldier-worn gear multiplies fast; a single hub replaces a tangle of point-to-point connections
Detection-only systems (radar)	SWaP, especially when the unit rides on a drone	Every gram and cubic centimeter is a tradeoff against flight time and payload.
Kinetic or destroy systems (missile, projectile)	Carrying missile power through a connection that must separate cleanly at launch	A bad connector doesn't just waste a shot. It can turn a guided munition into an unguided “dumb fire.”

USE CASES: CONNECTIVITY IN FIELDED AND IN-DEVELOPMENT C-UAS SYSTEMS

The following real use cases illustrate how these challenges play out in practice and the solutions implemented. They span detection, jamming, and kinetic defeat, and they span vehicle, soldier, and munition platforms.

DISMOUNTED SOLDIER COUNTER-UAS KIT

This dismounted counter-UAS kit combines a handheld RF detection device and a handheld drone jammer with a ruggedized smartphone-based end-user device, tactical radios from multiple manufacturers, and a soldier-worn digital system. During a recent field evaluation, the kit was tested with Fischer KEYSTONE™ hubs, connectors, and cable assemblies as the wiring architecture.

The challenge

Modern soldier systems combine devices from multiple vendors: radios, end-user devices, sensors, targeting systems, and electronic warfare equipment. Each device traditionally requires a dedicated point-to-point connection and device-specific integration. This increases the number of cables and connectors a soldier carries, adds integration work every time a new device is fielded, and raises the physical and cognitive burden on the operator in the field.

The solution

Fischer KEYSTONE replaces that tangle of point-to-point connections with a single power-and-data hub, so soldiers connect supported devices through one interface rather than managing a separate cable run for each. Because KEYSTONE integrates devices through standardized interfaces built to NATO STANAG 4695/4851, Nett Warrior, and GOSSRA-compliant specifications, devices from different vendors can plug into the same architecture without device-specific integration work each time a new one is fielded. The hub also distributes power and data across connected devices, cutting the number of batteries and cables a soldier carries. Because this hub rides on the soldier rather than in a vehicle or shelter, the hardware has to hold up on its own in the field: Fischer UltiMate™ 80 blind-mate, IP68-sealed connectors (mated and unmated) are rated for over 10,000 mating cycles, with 360° EMC shielding, an operating range of –55°C to +135°C, and compliance with MIL-STD-810 and MIL-STD-202. KEYSTONE hubs accept battery inputs from 10 to 20 VDC at up to 5 A, allowing integration with a variety of military battery systems rather than requiring a proprietary power source.

HANDHELD JAMMER

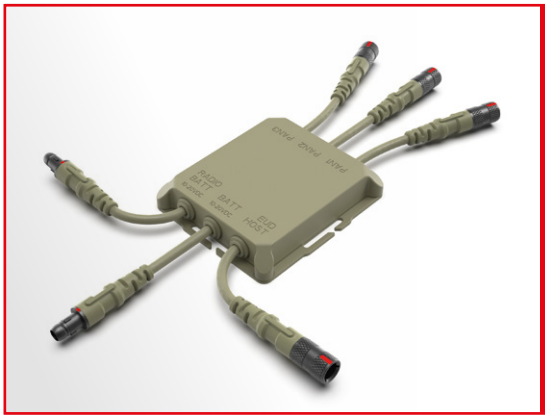
This handheld C-UAS jammer is paired with radar and a full operator kit. It has been introduced to the C-UAS market using the Fischer KEYSTONE hub as its connectivity point, linking the jammer, radar, and operator kit through a single connection.

The challenge

A handheld jammer operator works within a narrow engagement window: detect, confirm on radar, aim, hold. As LTC Ian Wilson of the British Army described at the Future Warfighter Conference in June 2026, the modern battlefield is observed, contested, and under constant surveillance, forcing soldiers to process an expanding volume of data from ground and airborne systems, including sensors worn on their own bodies. In this window, a connector or power failure does not just cause a delay. It can mean a missed intercept opportunity.

The solution

The Fischer KEYSTONE hub is designed for quick connect, blind mating in field conditions, so an operator can connect the jammer, radar, and operator kit correctly on the first try even under time pressure, reducing the risk of exactly the kind of fumbled or failed connection that turns a delay into a missed intercept. It also adds a Power Management Utility that manages power draw across all connected devices, keeping power reliable as the sensors and systems on a kit grow faster than soldier-carried battery capacity.



Fischer KEYSTONE™ data and power hubs provide easy connectivity and efficient data and power management for soldier-worn digital equipment. Designed to serve as the central hub connecting jammers, radars, and operator systems, it reduces the physical, cognitive, and logistical burden on soldiers through plug-and-play operation, streamlined power distribution, and fewer batteries and charging concerns in the field.

DRONE-DETECTION RADAR

This standalone, detection-only drone-detection radar (no jamming or kinetic function) is deployed either ground-based or drone-mounted. It uses a metamaterials electronically scanned array to steer the radar beam electronically instead of relying on a mechanically rotating dish, packing radar performance once reserved for large systems into a compact, low-power unit. The platform was designed roughly a decade ago, before counter-UAS was a defined market, and demand has spiked over the past year as the broader C-UAS market has grown. Newer versions retain the short-range envelope but add multi-object tracking to address drone swarms.

The challenge

The manufacturer's design priority for this radar class is size, weight, and portability. The unit fits in a backpack, roughly laptop-sized, with fast setup and teardown treated as a first-order requirement. Multi-object tracking also increases the data throughput the interconnect has to support as the radar's processing load grows, all within the same size and weight budget.

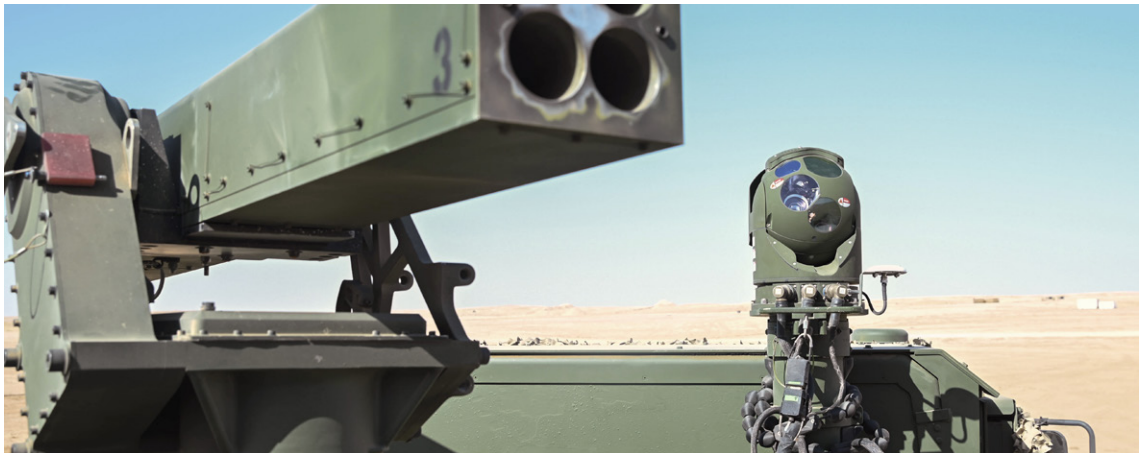
The solution

The Fischer MiniMax™ connector series was selected because it meets the platform's size and weight requirements. Built for high-density miniaturization, MiniMax replaces multiple large connectors with fewer, smaller ones and combines multiple protocols into a single interconnect, available with a quick-release locking system that supports the fast setup and teardown the platform requires. It also supports USB 3.2 and Ethernet contact configurations depending on the pin-out selected, giving the interconnect headroom for the added data throughput that multi-object tracking requires.

Fischer MiniMax™ series delivers miniature high-speed data and power connectivity for rugged devices where SWaP (size, weight, and power) is critical. Combining mixed signal and power transmission in a compact, water-tight housing, it maximizes performance in a smaller footprint and is available with push-pull, screw, or quick-release locking systems for demanding environments.

VEHICLE-MOUNTED WEAPONS SYSTEM

This portable, vehicle-mounted weapons system is designed to shoot down enemy drones. This platform-agnostic counter-UAS and counter-ground-target system combines a stabilized optical and laser gimbal for targeting and tracking with a launcher firing laser-guided rockets; an electronic-warfare jamming variant also exists. It is actively fielded in Ukraine and mounts on standard or improvised military and light tactical vehicles, as well as static crate-style deployments and rotary aircraft.



The challenge

The connection between the gimbal and the launcher has to carry the data the gimbal generates to track and locate the drone, not significant power, while surviving harsh field conditions: mud, cold, and repeated mating cycles in palletized or mobile use. The cable assembly integrator contracted to design the system's external cable assemblies needed a connector that soldiers could mate correctly and quickly without specialized training.

The solution

The integrator specified a Fischer UltiMate size 07, 10-pin plug and receptacle for the gimbal-to-launcher interface. (The system's other interface point uses a mil-spec 38999 connector that Fischer does not supply.) The selection was based on three factors: ruggedness and reliable sealing under harsh field conditions, ease of correct mating in the field, and past performance, since an existing component in the system had already used Fischer UltiMate successfully before this application.

Fischer UltiMate™ series delivers ultra-rugged, compact connectivity for mission-critical applications requiring reliable power and high-speed data transmission in extreme environments. The series features lightweight, sealed connectors with robust mechanical keying, IP68/69 protection even when unmated, and 360° EMC shielding.

MISSILE-MOUNTED COUNTER-DRONE WEAPON

This one-time-use missile can be used against drones or other targets; it is not an exclusively anti-drone weapon. A Fischer Core series connector, fitted with a lanyard disconnect feature, carries the missile's power and disconnects the cable cleanly when the side-mounted launch rockets fall away after launch.

The challenge

This connector carries the missile's power, making it a genuine single point of failure. A failure or an improper disconnect leaves the missile without guidance entirely, an unguided "dumb fire," which risks a missed target, collateral damage, or a friendly-fire incident.

The solution

Fischer Core was selected for two reasons: the lanyard disconnect function itself, and cost, since the connector is destroyed on every launch and purchased in volume.

Fischer Core series provides versatile, high-performance connectivity for demanding applications, with more than 20,000 standard circular connector options and extensive customization capabilities.

THE MOVE TOWARD NETWORKED, OPEN SYSTEMS

C-UAS is increasingly a sensor-to-weapon network challenge rather than a collection of standalone systems. Across defense programs, organizations are moving toward open, modular architectures that connect sensors, command software, and weapons through a shared data layer, an approach reflected in the U.S. Army's Next Generation Command and Control (NGC2) program.

NGC2 is built around containerized applications operating on an open data architecture, with ATAK expected to remain one of the principal soldier-facing interfaces. While much of the focus is on software interoperability, a recurring challenge across connected-soldier initiatives is integrating sensors, radios, and computing resources at the tactical edge through a wearable hub, the space Fischer KEYSTONE is designed to occupy.

CONCLUSION

As C-UAS hardware gets smaller, more networked, and more critical to the mission, the connector and cable assembly layer moves from an afterthought to a major engineering decision. A single connector choice can decide whether a radar is light enough to fly on a drone, whether a missile guides to target instead of going dark mid-flight, and whether a soldier's sensor suite works effortlessly or becomes one more thing competing for attention in a fight that's already moving too fast.

Fischer Connectors' position in this market isn't built on one flagship win. Fischer products are integrated into soldier kits, vehicles, and munitions alike, doing detection, jamming, and kinetic-defeat work in systems fielded today and others still in development. As the market moves toward the same open, networked architecture that NGC2 is chasing for the broader connected-soldier problem, Fischer's hub, connector and cable products are already built for where this market is headed, not catching up to it.

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ABOUT FISCHER CONNECTORS

Founded in Switzerland in 1954, Fischer Connectors designs, develops, and delivers high-performance interconnect solutions for the reliable transfer and management of data, signals, and power in demanding environments and mission-critical applications across defense and security, medical technology, test and measurement, energy, oil and gas, industrial automation, robotics, marine, unmanned systems, and transportation.

Leveraging advanced expertise in ruggedization, sealing, high-density miniaturization, and high-speed data transmission, Fischer Connectors is recognized worldwide for the reliability, durability, and quality of its connectors, cable assemblies, and customized electronic solutions, including data and power hubs. Its products are tested to MIL-SPEC and IEC standards and comply with RoHS and REACH requirements.

As part of Conextivity Group, which employs nearly 1,000 people globally, Fischer Connectors benefits from shared industrial and innovation capabilities across a Group R&D center in Switzerland, regional engineering hubs, three primary manufacturing sites, and an extensive partner network. Together with its sister company Wearin', a specialist in connected technologies that enhance situational awareness for intervention personnel, Fischer Connectors helps advance the Group's vision of "Reimagining Connectivity." This unique positioning enables Conextivity Group to address the entire connectivity value chain, from interconnected devices and sensors at the edge to cloud- and AI-enabled ecosystems.