



# SINGLE PAIR ETHERNET CONNECTIVITY SOLUTIONS

**COMPACT & LIGHTWEIGHT**  
**EASY & FAST CABLING**  
**SEAMLESS RUGGED  
CONNECTIVITY**

Up to IP68 sealing

Ultra-robust materials

Vibration & shock resistant



The Ethernet has spread in many sectors, including defense, industrial automation, transportation, smart cities and defense that require the use of networked devices.

More recently, in the automotive industry and in industrial automation (linked to Industry 4.0), connectivity challenges have arisen due to the increase in sensor density, actuators and controllers:

- long cabling distances to cover;
- bandwidth limitations from legacy connectivity systems;
- and complexity from managing multiple protocols.

These challenges have fueled the demand for a smaller, lighter and more affordable version of the Ethernet – the Single Pair Ethernet (SPE). SPE uses just one pair of twisted copper wires to transmit data at speeds ranging from 10 Mbit/s to 10 Gbit/s, with Power over Data Line (PoDL) up to 52 Watts and over distances from 15 meters (at 10, 100 and 1000 Mbit/s) to 1000 meters (at 10 Mbit/s).

## **SPE in a nutshell**

- Compact and lightweight: two wires instead of 8 copper wires for Gigabit Ethernet
- Fast and easy to cable and repair
- Increased durability:
  - Energy saving thanks to its light weight
  - Higher material resistance and less cable servicing, due to more flexible cables that withstand more bending cycles
- Greater flexibility of movement for machines and robots
- Versatile connectivity solutions (with a choice of installation length, bandwidth, with or without PoDL)
- End-to-end seamless connectivity

Fischer Connectors designs, manufactures, and distributes rugged connectors and cable assemblies particularly suitable for applications requiring faultless precision, durability and resistance to extreme conditions. We can now combine SPE's unique features with our renowned high-reliability, high-performance, sealed connectors to take SPE connectivity to new heights and markets.

# SINGLE PAIR ETHERNET

## Defense & Security

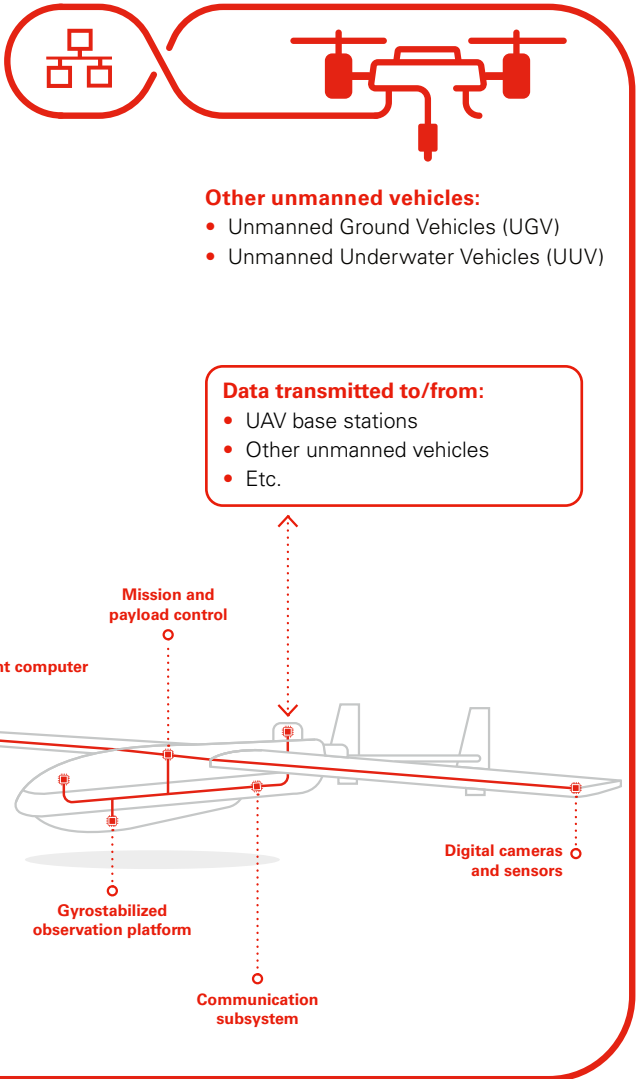
Single Pair Ethernet (SPE) is designed to meet multiple device-connectivity needs. What if you could benefit from SPE in Defense & Security environments, such as for unmanned aerial vehicles (UAVs)?

### Opportunities for using a Single Pair Ethernet protocol


- **Networking onboard controllers, sensors and actuators (the payload)** via Ethernet/IP connectivity in **larger drones** brings two key advantages:
  - electrical fail-saves (if one module fails, the other will not be affected thanks to electrical insulation between components);
  - enhanced modularity (allowing the payload to be adapted to various mission requirements).
- **Optimizing size and weight** is key to maximizing the UAV's **autonomy range**: the heavier the payload, the shorter the autonomy range (higher power consumption). SPE's lightweight and space-saving features, while still allowing for speeds of up to 1 Gbit/s, provide crucial benefits.
- SPE's space- and weight-saving features enable **seamless connectivity between all interconnected devices and base control** to be implemented throughout the UAV, eliminating protocol discontinuity.

### Why a Fischer Connectors solution?

- In environments with a high level of **vibration and shocks**, rugged connectors have to deliver **reliable connectivity solutions** with a high tolerance to guarantee the continuity of signal transmission in any situation.
- In diverse climatic conditions, **sealing** is as critical as temperature resistance.
- UAVs operating over multiple years require highly **durable** and trusted solutions.



## Our connectivity solutions

PRODUCT	SIZE	LAYOUT	CONTACT BLOCK	10 Mbit/s (shielded)	100 Mbit/s (shielded)	1 Gbit/s (shielded)
FISCHER MINIMAX™ SERIES 	06	0202 (4 pins)		●	●	●
FISCHER CORE SERIES BRASS 	102	051 (2 pins)		●	●	—
FISCHER ULTIMATE™ SERIES 	07	004 (4 pins)		●	●	—
FISCHER FREEDOM™ SERIES 	08	004 (4 pins)		●	●	—



For more information visit  
**fischerconnectors.com**

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