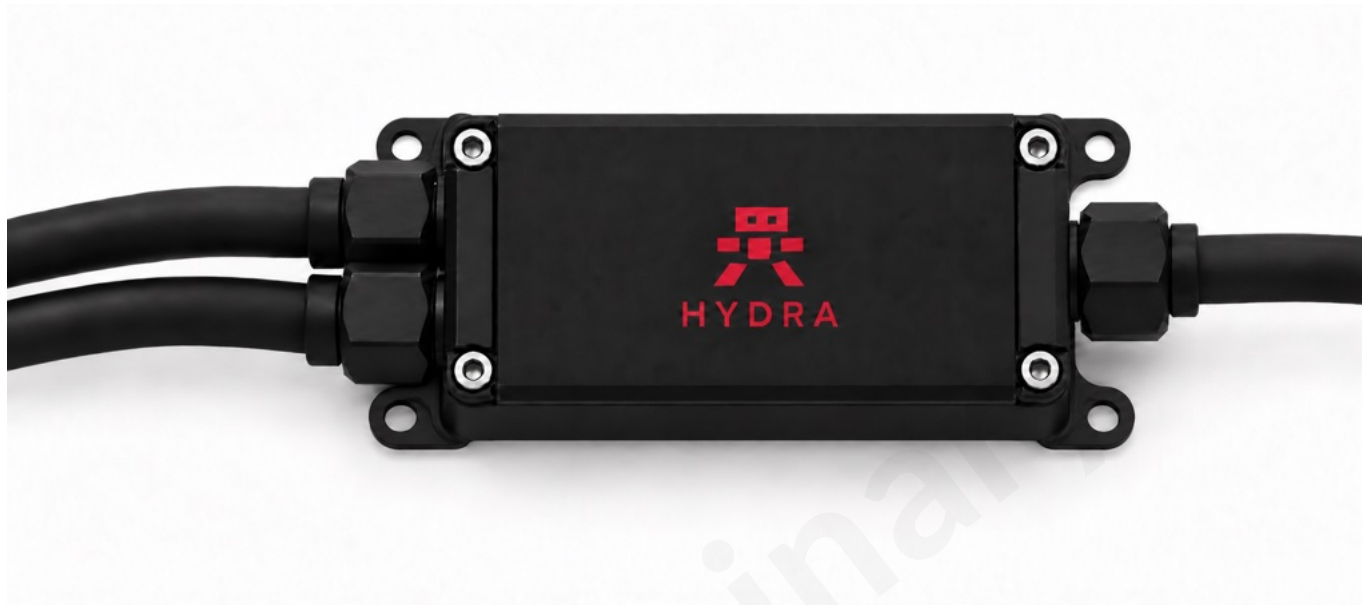


Hydra

A tiny rugged, security qualified Router, hidden in the cable. Designed to fly, roll, and drive.



A three-port Ethernet router. Built into the cable.

The ideal router is no router at all. With Hydra, it disappears into the cable run.

Hydra puts an OpenWrt router inside a tiny three-way Ethernet cable junction, with a target enclosure footprint of just 21×37 mm. Connect three 10/100BASE-T devices and supply power through passive PoE—all at the junction of the cables.

No separate router board to mount, heatsink, or fit into another enclosure. The networking becomes part of the cable assembly.

Key features

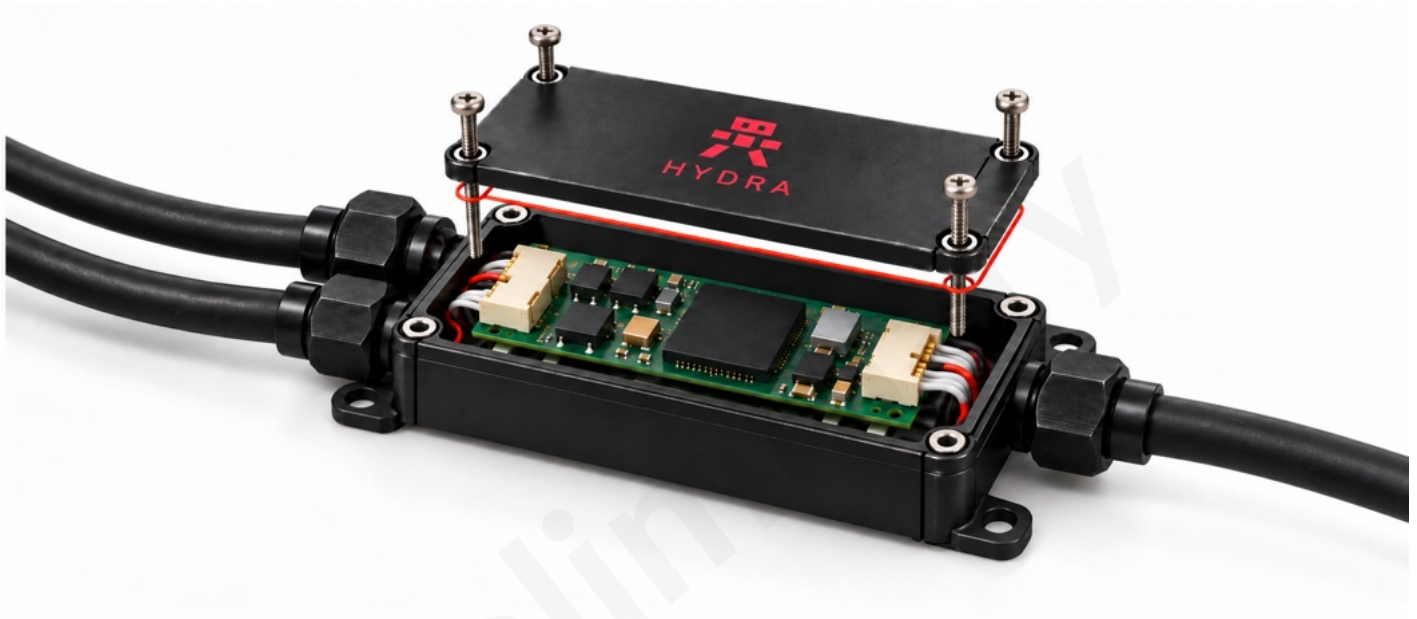
- Cable-integrated router, targeting a 21×37 mm enclosure footprint
- $3 \times 10/100$ BASE-T Ethernet ports
- OpenWrt, with planned support for VLANs, firewalling, VPNs, and more
- 800 MHz processor, 2 Gbit RAM, and 16 GB storage
- 5–30 V input via passive PoE
- Hardware AES-256 and an on-chip random number generator
- Optional RF SoC for CLI access, disableable in hardware
- Target operating range of -45°C to $+85^{\circ}\text{C}$, with altitude, shock, and vibration tolerance under development

Put the router where the cables meet

A small router board still needs somewhere to go. Mounting hardware, connectors, cooling, and cable routing all take up space beyond the board itself.

Hydra brings those electronics into the cable junction. Its compact enclosure connects three Ethernet cable runs, letting you integrate routing directly into the wiring of your system.

With a target footprint of **21 × 37 mm**, Hydra is designed specially for space-constrained platforms.



OpenWrt inside

Hydra is built around the SAM9X75D2GT, with an 800 MHz processor, 2 Gbit RAM, and 16 GB storage running OpenWrt.

The planned software feature set draws on OpenWrt's networking capabilities, including VLANs, firewall rules, port mirroring, and VPNs such as WireGuard. Configure network segmentation, control traffic between devices, and establish secure remote connections through a familiar software platform.

Supported packages and forwarding performance will be confirmed through firmware testing.

Security and control

Hydra's processor provides hardware AES-256 support and an on-chip true random number generator specified as compliant with FIPS 140-3 requirements.

An optional RF system-on-chip provides wireless CLI access. For secure environments, the RF device can be disabled in hardware.

Power through the cable

Hydra accepts 5–30 V via passive PoE, carrying power through the Ethernet cabling and eliminating a separate power lead at the junction.

The electrical documentation will specify the pinout, compatible power sources, and power budget. Passive PoE does not use IEEE 802.3af/at/bt negotiation.



Designed for demanding environments

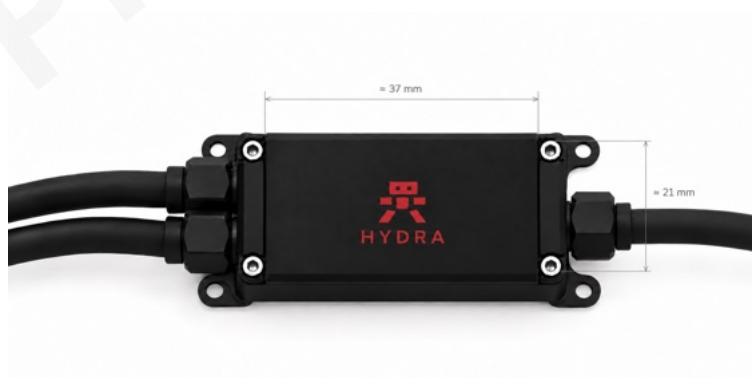
Hydra is being developed for a -45°C to $+85^{\circ}\text{C}$ operating range, with a mechanical design intended to tolerate altitude, shock, and vibration.

Environmental ratings and test conditions will be published after validation.



Technical specifications

Parameter	Specification
Ethernet interfaces	3 × 10/100BASE-T
Processor	SAM9X75D2GT
Processor speed	800 MHz
RAM	2 Gbit
Storage	16 GB
Operating system	OpenWrt
Planned networking capabilities	VLANs, firewalling, Layer 2 filtering, port mirroring, NAT, IPv4/IPv6, policy-based and dynamic routing, multiple IP addresses per interface, multi-WAN, load balancing, failover, high-availability redundancy, DNS/DHCP servers, traffic shaping, bandwidth controls, and VPNs including WireGuard; pending firmware validation
Cryptography	Hardware AES-256 support
Random number generation	On-chip TRNG specified as compliant with FIPS 140-3 requirements
Wireless CLI access	Optional RF SoC; disableable in hardware
Power input	Passive PoE
Input voltage	5–30 V
Form factor	Three-way Ethernet cable junction
Target enclosure footprint	Approximately 21 × 37 mm; final dimensions to be confirmed
Target ingress protection	IP67; pending validation
Target operating temperature	–45°C to +85°C; pending validation



Development status

Hydra is in development. Final enclosure dimensions, cable options, software support, performance, and environmental specifications will be published after testing.