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# Hardware Integration in Real Time for Automotive Prototyping

## CANNY Hardware

**When your innovative automotive concepts come to life.**

Early-stage development is where bold ideas begin, but transforming them into real, testable user experiences is a complex challenge. Most Human-Machine-Interface prototyping ventures fall short in one key area: connection to actual hardware.

That's where CANNY Hardware makes a difference.

Developed by intive, CANNY Hardware bridges digital HMI concepts with physical vehicle systems. It gives design and concept teams hands-on control over real components like seats, mirrors, and lights, allowing you to create interactive, testable UX experiences well before production starts.

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# The tech that enhances the experience

## Canny Hardware Platform

The **CannyCU** series is a versatile ecosystem of both general-purpose and specialized control units, used in projects whenever real-device integrationis needed, whether connecting to individual ECUs or entire vehicles.

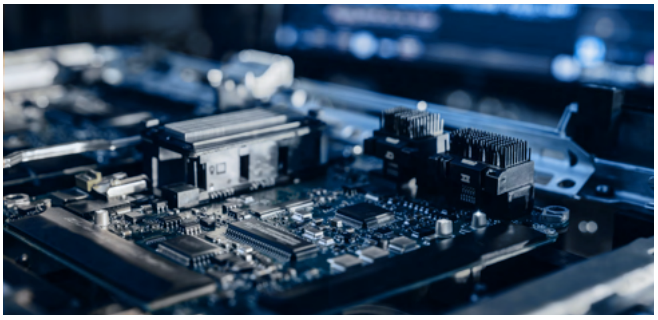
Paired with the **Simba C++** software framework, it enables fast and reliable hardware prototyping, ideal for presentations, user studies, and early-stage testing.

Designed with support for **CAN-FD, Automotive Ethernet,** and other key automotive protocols, it can integrate with nearly any component in modern vehicles.

Some CannyCU devices also feature a **standardized module slot,** allowing for flexible expansion based on specific project needs.

## Why to Choose CANNY Hardware:

- **Not just testing:** a real-time development environment
- **Holistic approach:** as part of intive's SIMBA ecosystem, it connects hardware and software seamlessly
- **Trusted by leaders like Audi** in real vehicles
- **Scalable and flexible:** easily adaptable to future needs
- **AI-optimized:** Supports advanced features such as:
  - voice-activated comfort adjustments
  - AI-driven seating recommendations
  - context-aware climate and mirror settings



## Use cases:

- HMI & UX Concept Validation
- Prototyping for AI-Driven Systems
- Multi-Market User Testing
- Interactive Showcasing at Automotive Expos

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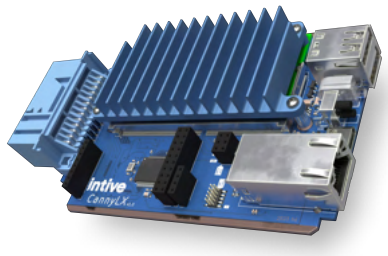
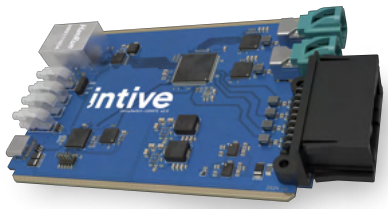
# What's under the hood

## Canny Hardware Platform



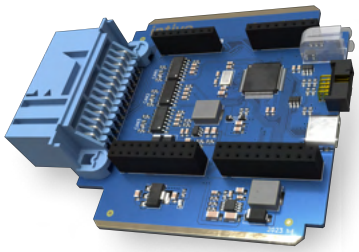
### CannyLX – "Heavy-Duty" Device
Gateway between PC and embedded hardware

- Operates on a customized Yocto Linux distribution
- Runs the Simba Message Broker
- Facilitates direct vehicle network connections with low latency
- Includes a CannyModule slot linked to the microcontroller and a USB connection
- Connects directly to CAN, LIN, Ethernet, FlexRay
- Can be powered by the vehicle's 12V mains or via USB



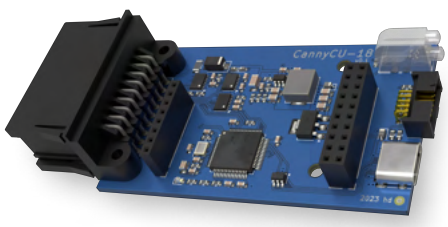
### CannySwitch – Connectivity Hub
The connection to the Automotive Ethernet

- Logs, reads, and modifies Ethernet data streams in vehicles
- Group Ethernet ports into VLANs for routing to a Gigabit Ethernet port
- Manages system configuration and power; supports Ethernet-to-CAN gateway
- Microamp sleep mode; wakes quickly on CAN activity



### CannyCU 26 & 18
Modular Control Units.The Canny module carriers

- **CannyCU-26** – versatile microcontroller platform
  - Designed to operate reliably in demanding environments
  - Supports up to two Canny modules



- **CannyCU-18** – compact version of the CannyCU-26, ideal for space-constrained applications
  - Utilizes the same CPU and CAN setup
  - Features one CannyModule slot
  - Approx. half the size of the CannyCU-26

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# CannyModules – For Every Use Case

## The Canny modular range

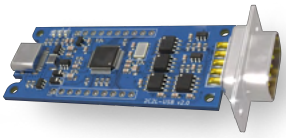
| Module | Typical application |
|---|---|
| **Stepper Module** | Control of stepper motors from CannyLX or CannyCU-26 |
| **FlexRay Module** | Reading and manipulating FlexRay data |
| **ADC Module** | Reading out potentiometers or other analog signals |
| **CAN Module** | Adds 3 additional CAN FD buses |
| **Digital IO Module** | Control of 4x 12V/5V/3.3V/OpenDrain outputs, read digital inputs |
| **ESP32 Module** | Adds Wifi, Bluetooth and capacitive touch functionality |

| Module | Typical application |
|---|---|
| **LED Strip Module** | Control of two dependent LED strips (WS2812 or SPI) |
| **LIN/SENT/ADC Module** | Adds 2 LIN channels, reading of SENT sensors, reading of potentiometers |
| **OLED Module** | Adds display and rotary/push dial |
| **Relay Module** | Adds 4 relays |
| **Rotenc Module** | Reading out 2 rotary encoders |

## Canny Microhardware – Designed for Every Scenario

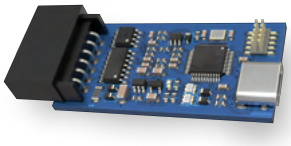
### 2C2L-USB (2x CAN, 2x LIN, 1x USB)

**Type:** Compact USB-CAN/LIN adapter
**Features:** Provides four automotive buses via a single D-SUB connector
**Applications:** Functions as both a USB-LIN and USB-CAN adapter



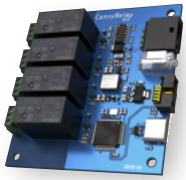
### CannyLIN

**Type:** Compact microcontroller board with LIN and CAN FD transceiver
**Features:** Small size and sleep mode capability for battery-powered applications
**Applications:** Functions as a LIN/CAN gateway



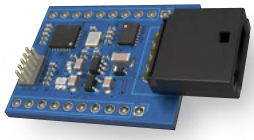
### CannyRelay

**Type:** Specialized version of the CannyCU
**Features:** Equipped with a CAN FD transceiver, four miniature relays (up to 10 A), and energy- saving sleep mode
**Applications:** Functions as a power switch



### CannyButton

**Type:** Smallest device in the Canny series
**Features:** Provides four automotive buses via a single D-SUB connector
**Applications:** Functions as both a USB-LIN and USB-CAN adapter



## Eager to Turn Your Ideas into Reality?

**CANNY Hardware** connects digital aspirations with tangible performance. Whether it's for R&D projects or engaging demonstrations, it's the ideal choice for teams focused on purposeful prototyping.

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