

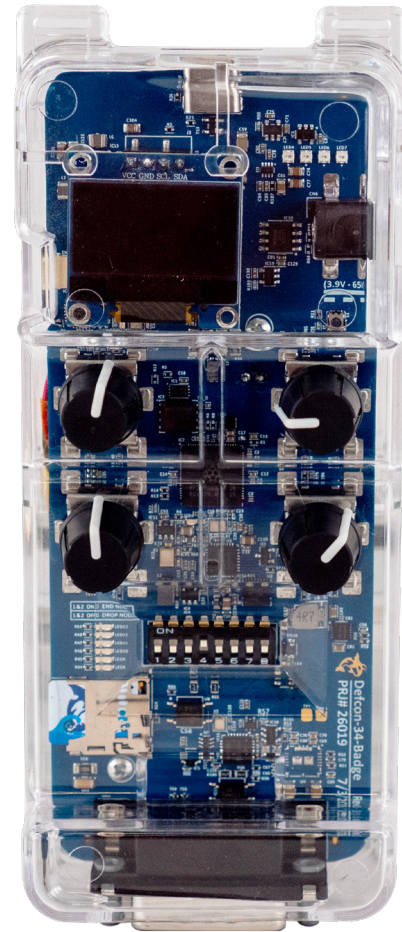
Intrepid T1S-T1L-CANFD SIM

Industrial & Automotive Hardware Auditing Platform

The **Intrepid T1S-T1L-CANFD SIM** consolidates multiple specialized network testing tools into a single portable device, providing researchers and security professionals direct access to industrial and automotive communication buses with built-in termination, intelligent bus monitoring, and field-proven durability.

Features

- 1x CAN / CAN FD port for automotive networks and factory automation
- 1x 10BASE-T1S short-reach industrial single-pair Ethernet ports
- 1x 10BASE-T1L long-reach industrial single-pair Ethernet ports
- USB Network Adapter with 10BASE-T1S and 10BASE-T1L Physical Layer (PHY)
- Internal SD card slot for storage
- USB serial terminal interface for tool integration and scripting
- Durable custom-molded clear case enclosure for field durability
- RS485 (Modbus RTU) with hardware compatibility for legacy and modern PLCs, RTUs, SCADA
- Selectable termination for T1S and software-controlled termination for CAN and RS485
- OneWILi API support (Rust, C/C++, Python, rTHON, WASM)
- Four programmable 360 Degree Encoder with buttons
- Four programmable multi-color LEDs
- Customizable 12x4 character OLED display.
- Power and configure via USB Type C
- Internal 1000 mAh 3.7V lithium battery for untethered field operation
- Independent Power Zones with selectively power CAN, T1S, T1L, and LED subsystems to extend battery runtime during untethered field auditing and optimize thermal performance



High-Voltage Industrial Power Subsystem

Engineered to safely survive real-world environments, the badge features three separate power rails to pull power directly from the asset under test:

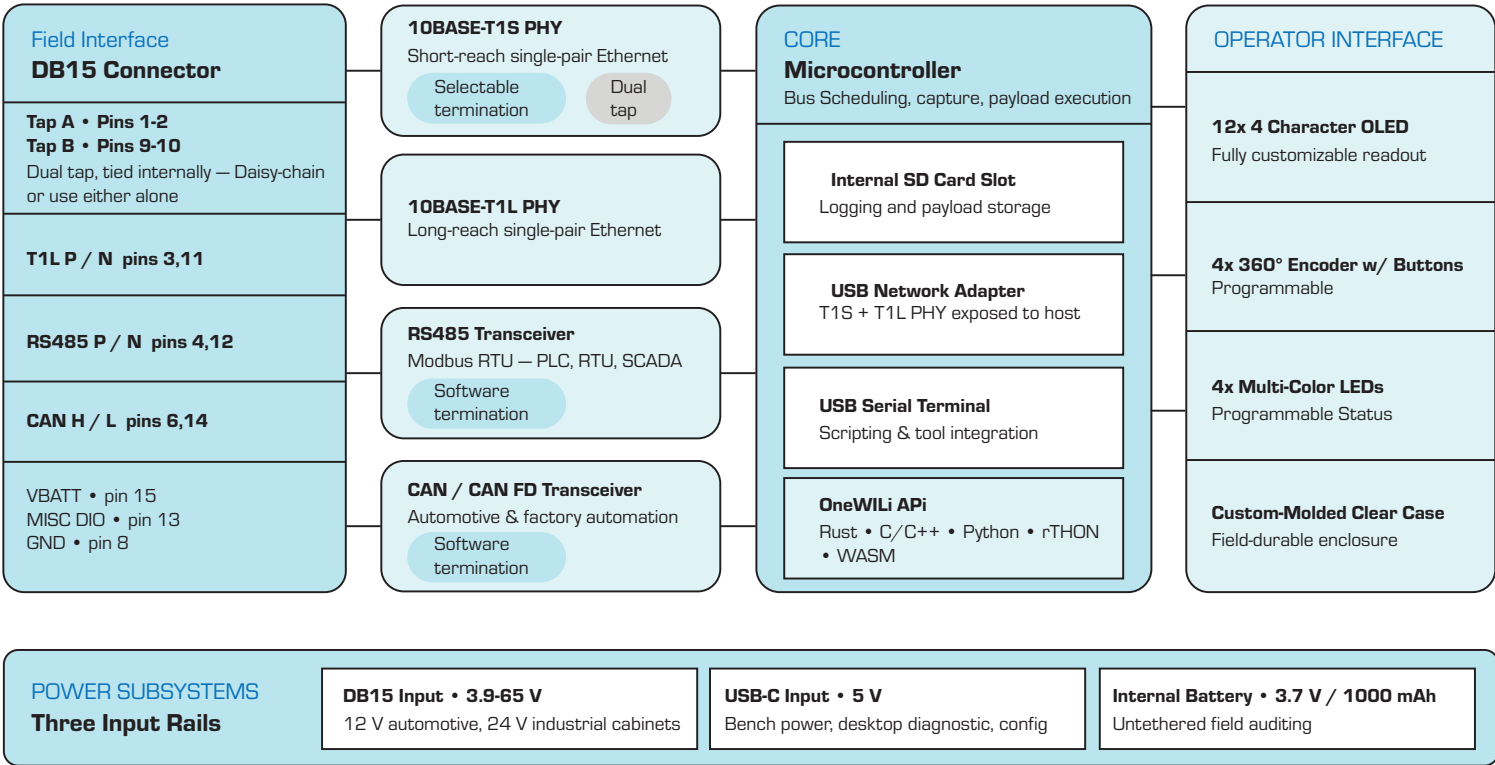
- **DB15 Input (3.9V – 65V):** Connects directly to standard 12V automotive batteries or 24V industrial control cabinets without worrying about voltage spikes or needing external regulators.
- **USB-C Input (5V):** Standard hardware interface for bench power and desktop diagnostics.
- **Internal Battery (3.7V / 1000mA):** Fully untethered hardware power supply for portable field auditing.



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Multi-Protocol Network Interface

RS485 (Modbus RTU) Full hardware compatibility for sniffing, tapping, and auditing legacy or modern PLCs, RTUs, and SCADA infrastructure.	CAN / CAN FD Direct line access for automotive networks and automated factory floors with simultaneous operation.
10BASE-T1S SPE Industrial and automotive short-reach single-pair Ethernet with onboard physical switch termination.	10BASE-T1L SPE Industrial long-reach single-pair Ethernet for extended cable runs in field deployments.

10BASE-T1S Dual-Tap Design

The T1S network features two physically separate connection points (Taps A and B on pins 1-2 and 9-10) that are electrically tied together inside the device. This dual-tap approach minimizes stub length issues in field deployments. Connect using either tap alone, or daisy-chain both taps in a mixing segment for optimal signal integrity on long cable runs.

Intelligent Power Zones

Each major subsystem (CAN/CAN FD, 10BASE-T1S, 10BASE-T1L, programmable LEDs) has independent power control, allowing selective activation based

on your testing profile. Minimize power draw during extended battery-powered field audits by disabling unused protocol interfaces.

Software & Interfaces

- API:** OneWILi API with native support for Rust, C/C++, Python, rTHON scripting, and WebAssembly (WASM)
- Control:** USB serial terminal interface for remote tool integration, logging, and payload deployment



Intrepid T1S-T1L-CANFD SIM

Why This Platform Replaces Hundreds in Equipment

- **Consolidated Single-Pair Ethernet:** Commercial T1S and T1L test boards are notoriously expensive and difficult to source. This platform integrates both alongside CAN FD and RS485 in a single field device.
- **Physical Bus Termination Built In:** Eliminates the need for fragile external breakout boards or manual resistor wiring to cleanly tap differential buses in real-world environments.
- **Direct Protocol Access:** Low-level physical access to critical communication lines in modern automation, substations, and heavy machinery.
- **Programmable & Extensible:** SD card payload deployment, native API support for Rust and Python, and customizable firmware let you extend capability for specialized testing and attack scenarios.

Hardware Platform

Processing & Storage

Main CPU	Raspberry Pi RP2350B-A4
Flash Storage	Field-upgradeable firmware
Local Storage	SD card slot, FAT32
Real-Time Clock	Battery-backed, 25ns hardware timestamping

Power & Environmental

Operating Voltage	3.9V–65V DC (automotive/industrial)
USB Input	USB-C 5V for bench power
Internal Battery	3.7V / 1000mAh lithium
Temperature Range	-20 to +80°C
Enclosure	Custom-molded durable clear case

Pinout

Pin	Signal
1	T1S IN #1 (10BASE-T1S positive - Tap A)
2	T1S OUT #1 (10BASE-T1S negative - Tap A)
3	T1L P (10BASE-T1L positive)
4	RS485 P (Modbus positive)
5	-
6	CAN H (CAN/CANFD high)
7	–
8	GND (Ground)
9	T1S IN #2 (10BASE-T1S positive - Tap B)
10	T1S OUT #2 (10BASE-T1S negative - Tap B)
11	T1L N (10BASE-T1L negative)
12	RS485 N (Modbus negative)
13	MISC DIO (General purpose I/O) - 5V
14	CAN L (CAN/CANFD low)
15	VBATT

Specifications subject to change; please contact Intrepid for the latest information. All trademarks are the property of their respective owners.

Ordering Information

Part Number	Description
T1S-T1L-CANFD-SIM	Intrepid T1S-T1L-CANFD SIM – RS485, CAN FD, 10BASE-T1S and 10BASE-T1L

Rev. 20260820



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