

RailSentinel-24

Control-power monitor and transient recorder for DC fast-charger cabinets

PRELIMINARY

RailSentinel-24 (RS-24) mounts on the DIN rail inside a DC fast-charger cabinet and watches the 24 V control supply that every relay, contactor and controller depends on. It records the transients that reset controllers before they can write a log, timestamps them against a battery-backed clock, stores them on board and reports them over Wi-Fi or Ethernet – independently of the charger's own controller. The measurement side and the electronics side are separated on the board by an isolation barrier.

0–62 V

measuring range · 12 / 24 / 48 V
DC control rails

±0.5 %

rail voltage after calibration

50 ms

event waveform at 10 µs
resolution

≥ 1,000

events stored on board

POWER INPUT

Supply	from the monitored rail	no separate supply
Rails	12 / 24 / 48 V DC control rails	nominal on the per-unit label
Operating input	24 V base: 9–32 V 48 V option: 36–60 V	one 100 V-rated input chain; 12 V rails: 24 V base, on a 12 V rail the power-loss record is a summary record
Protection	TVS clamp, reverse polarity	survives 70 V / 1 ms

RAIL MEASUREMENT

Measuring range	0–62 V	no clamp below 62 V: overvoltage up to 62 V is recorded in full; above 62 V the reading saturates and is flagged
Accuracy	±0.5 % after calibration	
Ripple trending	firmware, rolling baseline	PSU-degradation indicator
Current	with the clamp module	PLANNED · V2

ISOLATION AND FUNCTION

Barrier	designed for reinforced insulation	rail side vs. electronics side
Function	monitoring only	RS-24 does not control, inhibit or switch any charger function
Self-supervision	The measuring controller watches the communication controller. If its heartbeat stops, the alarm contact opens.	

J3 alarm contact. J3 (OK-CONTACT) is a potential-free, normally-open photoMOS contact that is closed while the unit is monitoring. It opens at power-loss stage 2 (rail < 0.667 × nominal, e.g. 16 V on 24 V), on reset, and while the isolated side is unpowered, and closes again ≤ 2 s after recovery. Typical open time on a deep rail dip with recovery: the dip duration + ≈ 1.5 s (≈ 2 s for a 10–100 ms interruption). Recommended PLC input debounce: ≥ 3 s for an alarm, no debounce for logging. J3 is a diagnostic contact, not a safety-chain input. Contact rating: ≤ 57.6 V DC, ≤ 0.5 A.

TRANSIENT CAPTURE

Trigger	hardware comparator, µs class	OEM & lab builds
Alert threshold	adjustable	per site, from firmware
Peak amplitude	±50 mV after factory calibration, 0–62 V	OEM & lab builds
Waveform	50 ms at 10 µs	per event
Timestamp	±2 ppm RTC (0 ... +40 °C; ±3.5 ppm over the operating range)	battery-backed, valid offline
Storage	≥ 1,000 events	the record survives a power loss

ENVIRONMENT

Operating	-10 ... +70 °C	cabinet interior
Storage	-20 ... +85 °C	
Humidity	5–95 % RH	non-condensing
Vibration / shock	tests to IEC 60068-2-6 / -27 planned; levels to be defined	

CONNECTIVITY

Wi-Fi	2.4 GHz	all variants, via the site network
Ethernet	1 port	Standard (DIN coupler)
Telemetry	MQTT	alert within 5 s of an event
OEM integration	Modbus TCP · MQTT	RS-24-M
Updates	signed OTA firmware	

VARIANTS

<p>RS-24-S · SLIM</p> <p>Slim</p> <p>Narrow DIN module. Wi-Fi. For small CPOs.</p>	<p>RS-24-S · COUPLER</p> <p>Standard</p> <p>DIN coupler. Ethernet (1 port) · Wi-Fi · USB-C. Expansion slots. Clamp module for rail current</p> <p>PLANNED · V2</p>	<p>RS-24-M</p> <p>OEM module</p> <p>Bare host board 99 × 69 mm for factory integration. Modbus TCP · MQTT. Signed OTA updates.</p>
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PLUG-IN MODULES PLANNED · V2

EXP-A (rail side)	clamp current	
EXP-B (electronics side)	RS-485 / Modbus · SD logger · DIP config	one option at a time
COM-ETH (inside the Standard coupler)	Ethernet, 1 port	
SENSE	temperature · sound · vibration	right-side module
Second COM	a second RS-485 line	right-side module
PIL	charger-car signals, observe only	never drives the pilot

ON THE ROADMAP · NO COMMITMENT

NFC tap-to-read at the cabinet	BACKLOG	Tell us what you need: hello@morgen-tech.com, subject "RS-24 roadmap vote". Your votes decide what we build first.
Cellular field variant	BACKLOG	
Hold-up power	BACKLOG	

STATUS AND PILOTS

Product in development. No CE marking yet; not commercially available. Not a certified safety component today. Pilot units from Q2 2027, on loan under a test agreement.

RailSentinel-24 and RS-24 are product names of Morgen Technologie UG (haftungsbeschränkt). Specifications may change without notice.