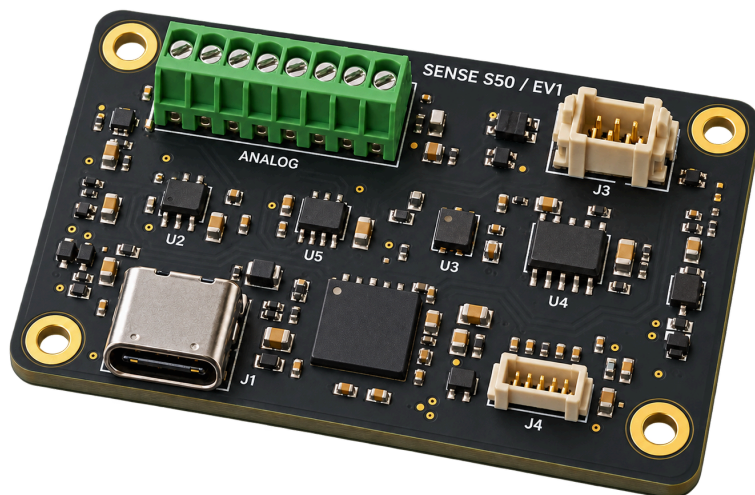


NODERIQ Sense S50

Precision and inertial sensing



Keep the measurement close to its source.

A small acquisition profile combining four simultaneous analog channels with inertial observation for compact instruments and distributed robotic sensing.

PCB outline

50 × 35 mm

Assembled height allocation

12 mm

Nominal bench input

5 V

Steady power allocation

1 W

Defined evaluation specification. Imagery illustrates the specified architecture; physical measurements, electrical release and completed system integration are not asserted.

Dimensions and mounting

NODERIQ / HARDWARE ENGINEERING

NODERIQ Sense S50

EV1 · Mechanical and installation allocation · 23 October 2026

TOPVIEW / MILLIMETRES

ASSEMBLY / CLEARANCE

50 × 35 × 12 mm

Allocated assembly box, including PCB and both sides.



Installation reserve

70 × 60 × 25 mm

Includes initial access and cable space. Validate the actual harness.

PCB 1.6 ± 0.15 mm

Outline ± 0.2 mm · Hole centres ± 0.15 mm

Placement envelopes do not define copper, pad stacks, pin multiplexing, isolation ratings or an electrical release.



4 × Ø 2.2 mm holes · 5 mm keepout diameter

Mount rectangle 44 × 29 mm · First centre (3, 3) mm

Origin: PCB lower-left. Connector reserves are defined in JSON.

Use stated dimensions. Preview is not a measuring tool. Separate 1:1 SVG and millimetre DXF supplied.

Evaluation specification · Physical acceptance requires recorded bench measurements. No manufacturing or certification claim.

NQ-S50 / M-01 / EV1

Mounting coordinates

(3, 3) · (47, 3) · (47, 32) · (3, 32) mm

Lower-left PCB origin, top view. Four Ø 2.2 mm holes. Centre tolerance ± 0.15 mm.

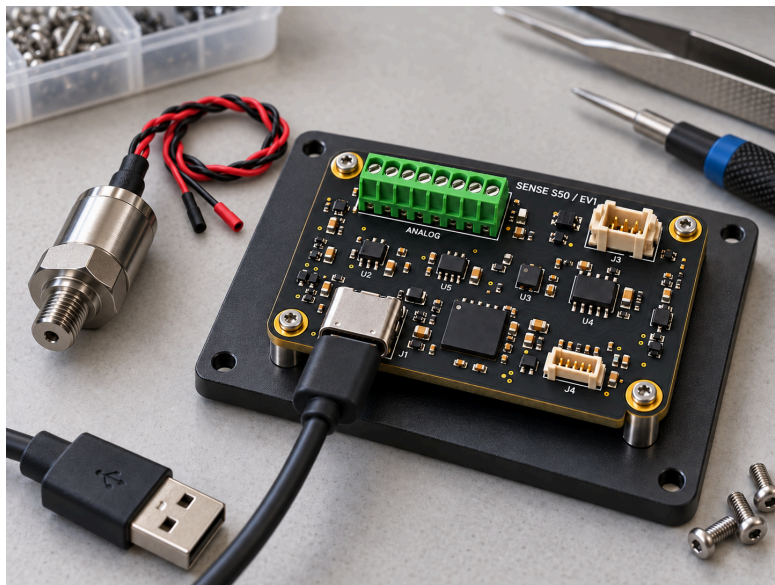
Installation reserve

70 × 60 × 25 mm

Allow access to mating parts, service screws and the actual cable bend. The final enclosure still needs a physical fit check.

The separate 1:1 SVG and millimetre DXF preserve the outline and mounting geometry. Placement rectangles are not land patterns, routed copper or a fabrication release.

Connectors and service access



Benchtop integration visualisation; use the electrical release and approved harness for wiring.

J1 / USB-C USB-C envelope	5 V input and USB bench data.
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J2 / ANALOG 8-position terminal envelope	Four low-voltage differential pairs; use the released analog front end and reference source.
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J3 / CAN 4-position locking header	One non-isolated uplink allocation.
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J4 / SWD 6-position locking header	3.3V debug/service reserve.
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Define the complete test configuration

Carry units, source time, calibration reference and sensor orientation with each observation. ADC word length is not measurement accuracy.

Four-channel acquisition at a 4 kSPS evaluation setting, gain 1, a traceable 0.5 V differential stimulus within the approved common-mode range, and a stationary IMU fixture.

EV1 screening values

Input range	4.75–5.25 V
Regulated rail	3.135–3.465 V
Maximum steady input	1 W
Minimum workload duration	30 min
Bench ambient	20–25 °C
Maximum measured surface	55 °C

Bench numbers are EV1 engineering screening criteria, not achieved measurements, accuracy ratings or qualified operating limits. Record configuration, equipment and raw evidence for engineer review.

Analog reference acquisition

- Simultaneous analog channels: 4
- Sample rate / samples/s: 4000
- Analog gain: 1
- Differential reference / V: 0.5
- Reference tolerance / V: 0.001
- Maximum absolute error / mV: 2
- Common-mode reference / V: 1.65
- Common-mode tolerance / V: 0.1

Stationary inertial fixture

- Minimum stationary duration / s: 60
- Minimum acceleration magnitude / g: 0.9
- Maximum acceleration magnitude / g: 1.1
- Maximum mean gyro magnitude / degrees/s: 2

Keep actuator power disconnected during the bench fixture. The independent machine controller and interlock remain separate from observation and mission software.

Fit, power and sustained load

Use the matching EV1 configuration and retain a raw record for every performed check.

MECHANICAL-FIT

Mechanical fit

Use callipers and the 1:1 outline or millimetre DXF. Record width, height, thickness, maximum hole-centre error and total assembled height. Inspect every fastener and mating connector with the intended enclosure and harness.

Retain: Measured dimensions, mounting photograph and enclosure/harness revision.

RAIL-STABILITY

Power rails and backfeed

With the approved assembly and supply, measure input and regulated-rail minimum/maximum values during start-up and the named workload. Record steady input power and test disconnected host/peripheral supply paths for unintended backfeed.

Retain: Power trace, instrument range, probe points, supply limit and fitted configuration.

THERMAL-LOAD

Sustained thermal load

Run the exact workload for the specified interval in the stated bench ambient range. Record the hottest measured surface, configured compute mode, cooling arrangement, resets and thermal-throttle flags. These screening conditions do not define an outdoor operating rating.

Retain: Timestamped thermal trace, ambient measurement, surface location and workload version.

Exercise the named interfaces

Use the matching EV1 configuration and retain a raw record for every performed check.

ANALOG-REFERENCE

Analog reference acquisition

Use the electrically released low-voltage analog front end and a traceable reference. Set the declared gain, common-mode voltage and sample rate. Exercise all four channels simultaneously and record the largest absolute error; ADC word length is not calibrated accuracy.

Retain: Reference-source and DMM records, input/common-mode conditions and per-channel capture.

INERTIAL-FIXTURE

Stationary inertial fixture

Fix the complete assembly in a documented stationary orientation away from vibration. Record acquisition duration, acceleration-vector magnitude and the largest absolute mean gyro reading. Keep the mounting frame and temperature with the capture.

Retain: Orientation photograph, temperature, duration and raw inertial samples.

AUTHORITY-BOUNDARY

Physical authority boundary

Keep actuator power disconnected during the fixture and retain the machine's independent interlock. Confirm that reconnecting a data link cannot automatically resume physical action. Identify the separate controller and review record that govern any later machine test.

Retain: Fixture boundary record, controller/interlock identity and supervised sign-off path.

Keep the measurements inspectable

The analog front end must be electrically released for its sensors before power-up. No direct mains, 24 V analog input, calibrated accuracy, vibration rating or environmental sealing is implied.

Measurement record and offline checker

Fill the matching blank JSON template with measured values, configuration, current instrument records and the identifier/SHA-256 hash of each raw record. Empty values remain missing; synthetic examples stay example-only.

```
node validate-evidence.mjs sense-s50-specification.json measurements.json
```

Requires Node.js 20 or later. Exit 0 means the checklist is ready for engineer review; it does not certify hardware or authorise physical operation. Incomplete, out-of-criteria and example-only records return exit 2.

Relevant component sources

[STMicroelectronics / STM32U575CG](#)

S50 basis: 7 × 7 mm UFQFPN48 option, USB full speed and CAN FD; actual pin multiplexing must be resolved in the electrical release.

[Texas Instruments / ADS131M04 simultaneous ADC](#)

Four simultaneous 24-bit channels. EV1 tests use 4 kSPS rather than asserting the component maximum as board throughput or accuracy.

[Bosch Sensortec / BMI088 inertial sensor](#)

3 × 4.5 × 0.95 mm inertial package; vibration and temperature behavior must be measured in the final mounting arrangement.

[JST / GH locking wire-to-board family](#)

1.25 mm connector-pitch reference. Public connector envelopes are reserved integration space, not an approved land pattern.

Product record: neuraparse.com/products/noderiq/cards/sense-s50/

Original PNGs, dimensional files, specification, blank record and checker accompany the evaluation pack. No proprietary firmware, routed board data or private NODERIQ endpoint is included.