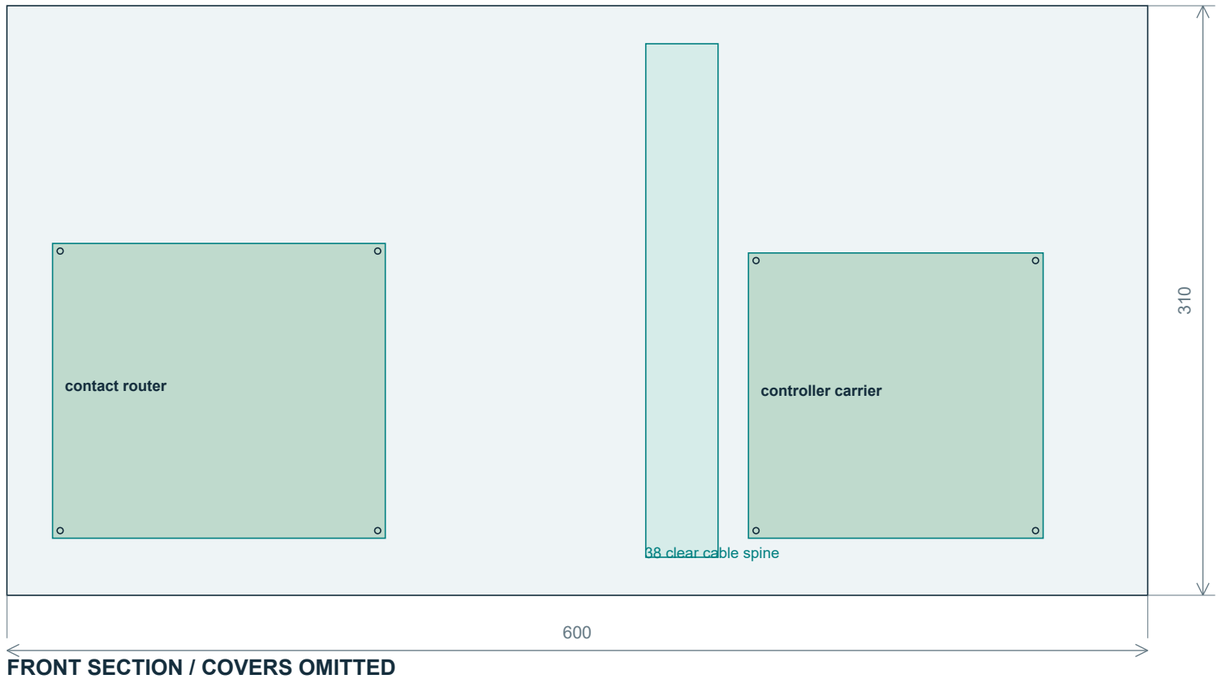
PROJECT SCCI RH

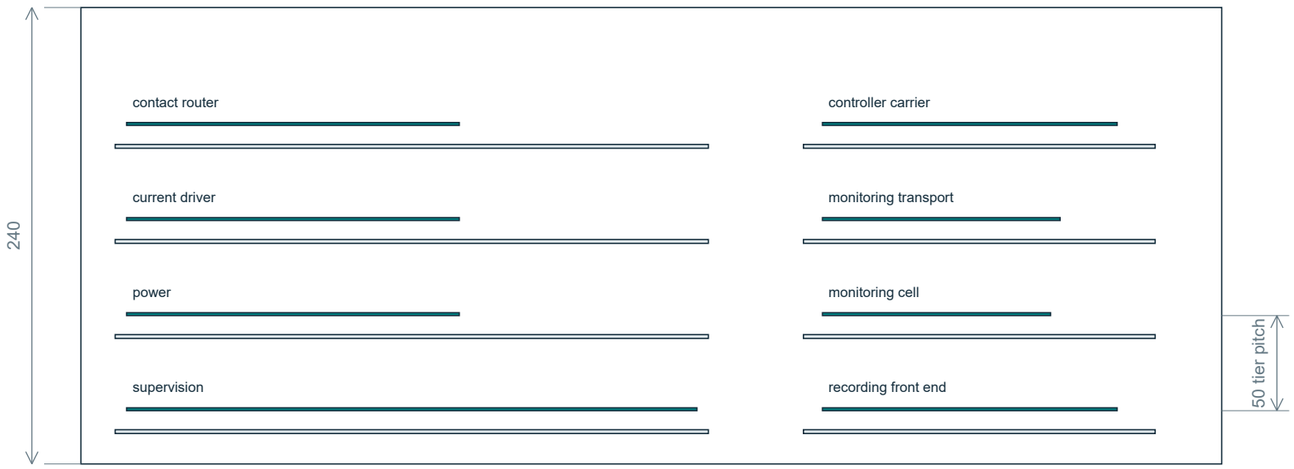
Reference chassis - general arrangement

Eight genuine populated boards; two bays; four removable tiers. Dimensioned review views; written dimensions govern.

PLAN / LID REMOVED



FRONT SECTION / COVERS OMITTED



PHYSICAL ALLOCATION

600 W x 310 D x 240 H overall, including feet. The base underside is Z8; feet occupy Z0 to Z8. Every board retains original populated geometry and its four native mounting holes.

MOUNTING DATUM

PCB bottom Z = 28, 78, 128, 178. Two millimetre trays and 10 mm insulating standoffs. M3 hardware has simplified clearance geometry; threads are not modeled.

REAR ACCESS

Two passive cable inserts route recording and guarded load lines separately from protected supply, companion and debug cables. No new active panel circuit is implied.

SERVICE ACCESS

Disconnect power and labelled plugs before removing a tray. Remove front cover and reserve at least 310 mm free space in front. Trays slide toward negative Y.

DRAWING INTERPRETATION

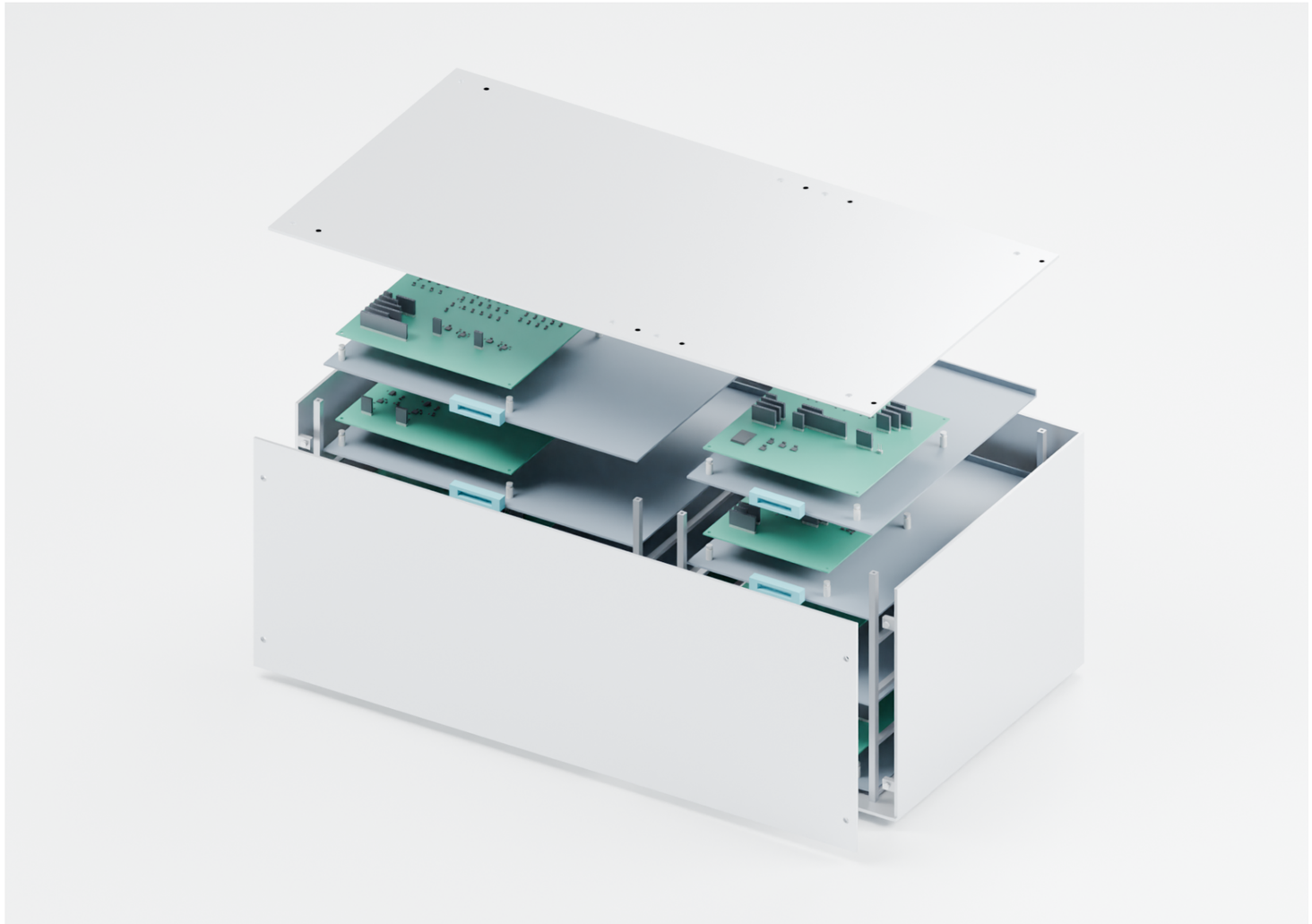
Only the upper tier is shown in plan. The front section identifies all eight boards. Detailed real packages and all source copper are available in native CAD/KiCad.

Digital reference + conditional implant concept. No physical, hermetic, anatomical or biological qualification.

PROJECT SCCI RH

Reference assembly - service and fit

Rendered from saved engineering BReps. Exploded positions illustrate assembly order; they are not operating positions.



ASSEMBLY ORDER

1. Install base, side/rear panels, posts and guide rails. Leave front cover and lid off.

2. Fasten four insulating standoffs to each tray. Use all 32 original PCB hole axes; fit boards and upper M3 screws.

3. Install labelled mating housings and branch harness according to electrical net identity. Keep HOST, AFE and companion returns separate.

4. Slide each populated tray into its assigned bay/tier, then connect labelled harness branches. Add passive rear cable inserts.

5. Inspect nominal clearances and cable/service space. Fit removable front cover and lid. Physical torque, retention and testing remain future work.

MECHANICAL CONTENT

Actual populated boards	**8**
Fitted electronic positions	**1296**
Reference mechanical pieces	**162**
PCB standoffs / mounting axes	**32**
Board mounting screws	**64**
Internal / external mating housings	**78 / 5**
Passive rear inserts / grommets	**2 / 5**

NOMINAL FIT LIMITS

PCB hole diameter 3.2 versus screw shaft 2.9 gives 0.15 nominal radial clearance. No thread or preload qualification.

Standoff 10 and underside projection 1.385 leave 8.615 nominal tray clearance before tolerance stack-up.

A 50 tier pitch leaves more than20 of selected populated-board-to-next-tray clearance. Actual per-pair checks bind the saved BReps.

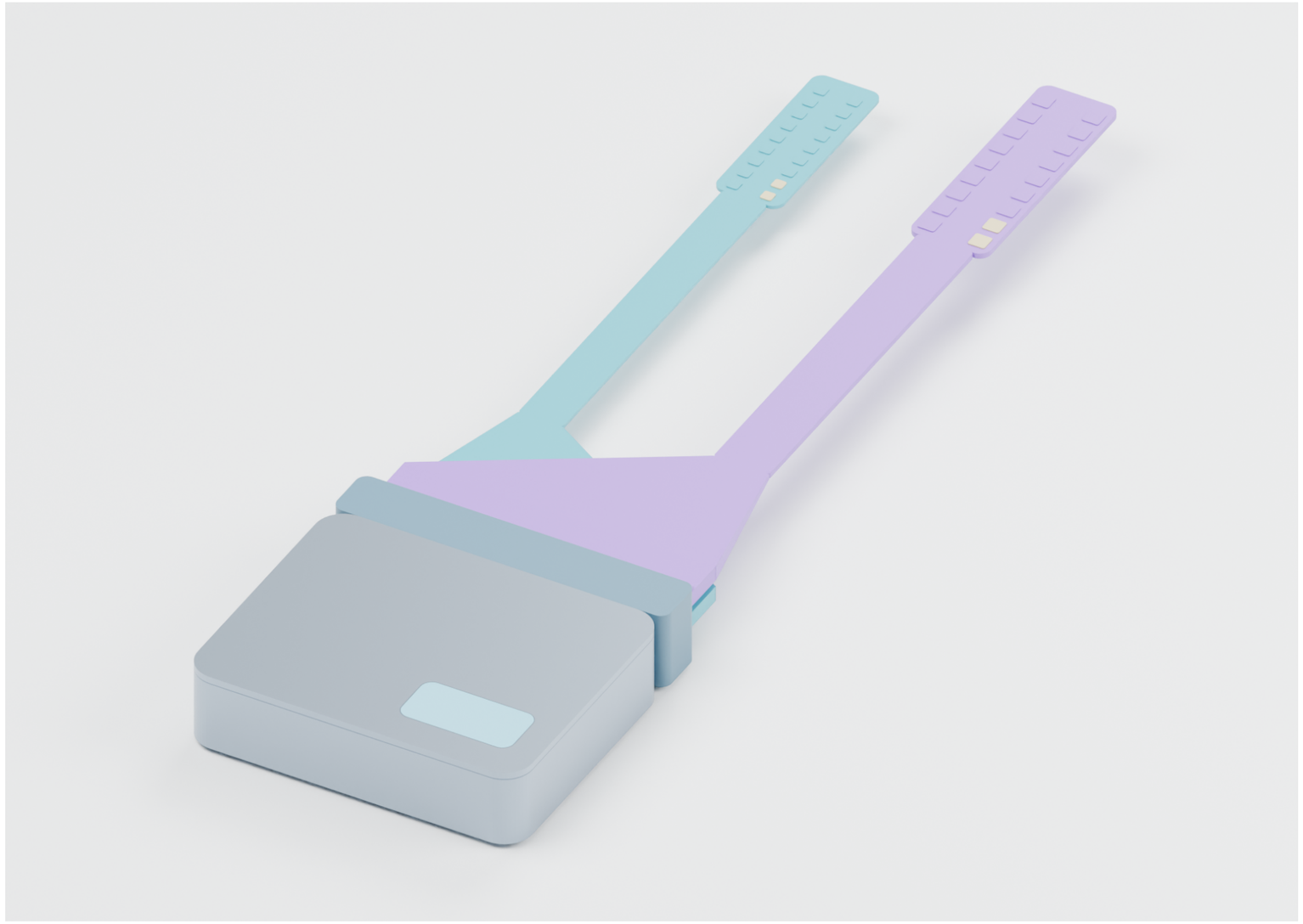
Suggested part-position review tolerance +/-0.25; do not convert these nominal drawings to a fabrication release without process-specific tolerances.

Digital reference + conditional implant concept. No physical, hermetic, anatomical or biological qualification.

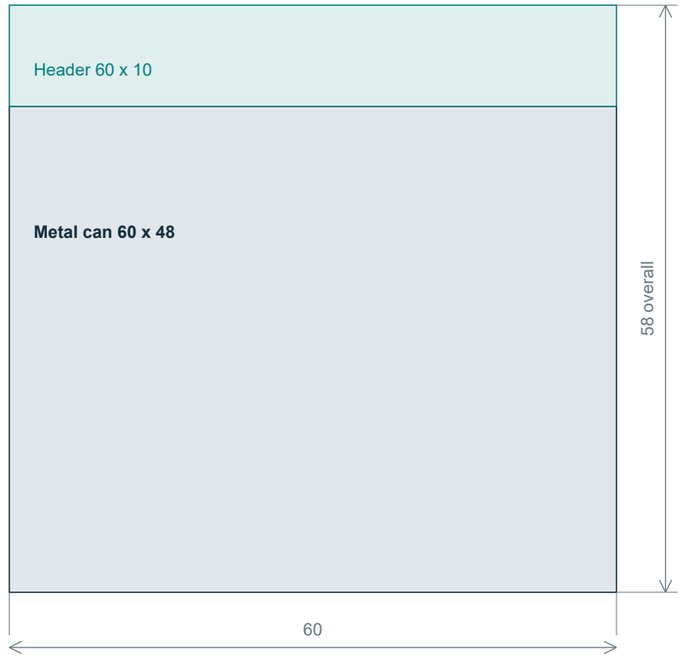
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Future implanted interface - nominal package

A separate conditional architecture: 36 functional feedthroughs and two keyed 18-position lead interfaces.



PACKAGE DATUM / PLAN



SECTION ENVELOPE



1.2 nominal metal wall allocation

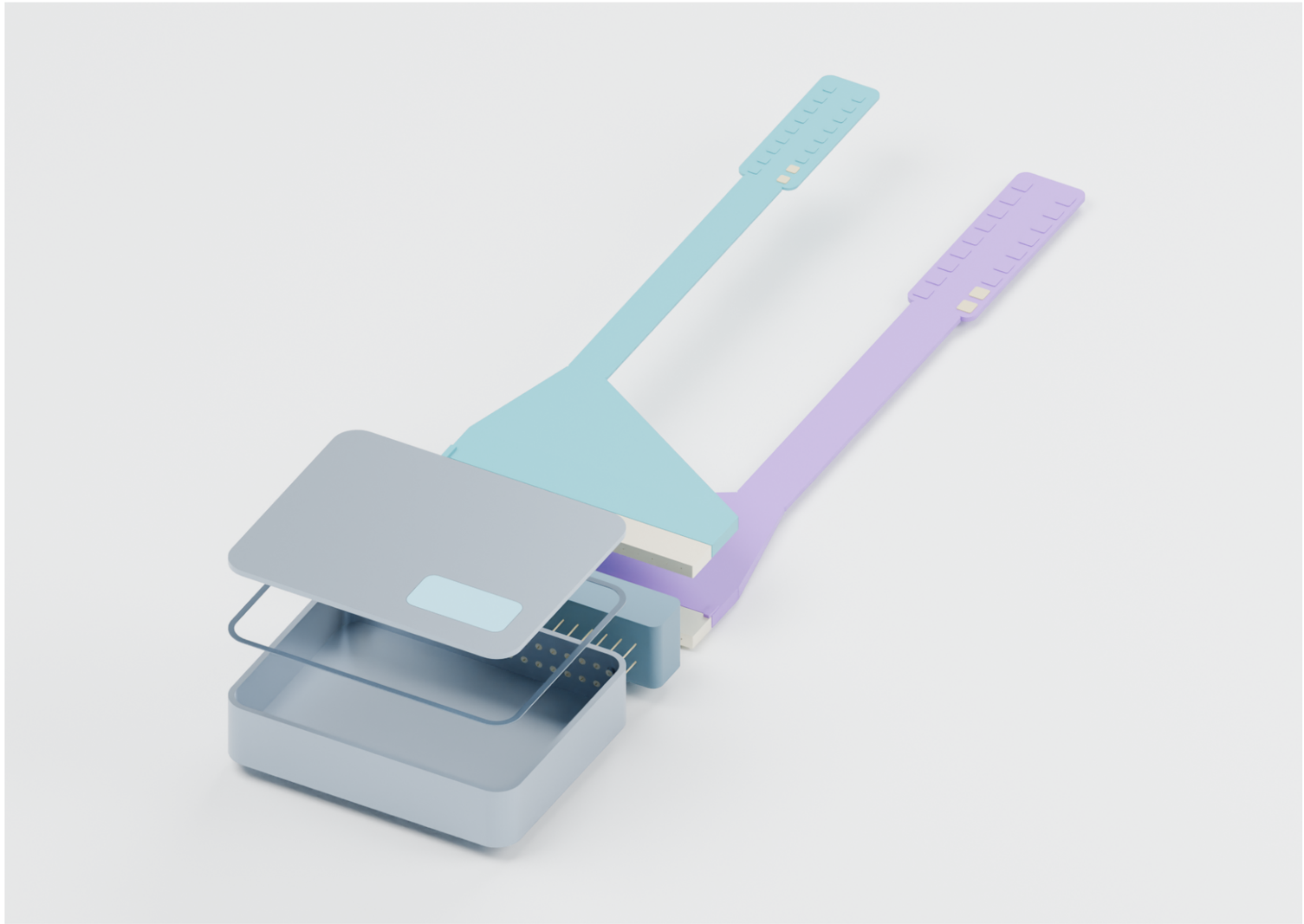
Lead and paddle dimensions are geometric hypotheses. Their anatomical placement, recruitment selectivity, current density and chronic material behavior have not been established.

16 recording signals + reference + current-bounded bias | 16 selectable stimulation contacts + 2 dedicated returns

Digital reference + conditional implant concept. No physical, hermetic, anatomical or biological qualification.

Future package - interfaces and architecture gap

Native cut/fuse dependencies and editable specifications; exported physical parts and internal reservations are identified separately.



PACKAGE AND SEAL CONCEPT

A metal can/lid, seam allocation, dielectric header and individually isolated feedthroughs define a plausible geometry. Native bores preserve separation between conductive pins and surrounding metal.

LEAD FUNCTIONS

Recording and stimulation leads are separate keyed 18-contact concepts. Reference and body bias retain distinct identities; body bias is not a stimulation return. Each distal contact has its own mapped conductor.

COMMUNICATION ALLOCATION

A conditional dielectric RF window and antenna reservation give the future package an explicitly proposed path through the metal shell. Current firmware implements no radio or network-core image.

ELECTRONICS REDESIGN REQUIRED

Eight reference boards cannot fit this can. A new multilayer/custom electronics implementation, integration, battery selection, heat removal, noise recovery and qualified feedthrough technology are prerequisites.

BIOLOGICAL PREMISE REMAINS OPEN

Spinal observations must contain useful task information, stimulation must selectively influence relevant circuits, and individualized feedback must remain stable. CAD does not establish expert-to-novice retained learning or physiological efficacy.

Body port bridge - all 36 functional identities

Maps the preserved Stage 2 names to exact Stage 4 electrical boundaries. Future CAD carries the same port IDs; no anatomy is inferred.

Port	Stage 2 function	Reference board	Header	Pin	Native source net	Protection / role
P01	REC_01	recording-front-end	J30003	1	REC00_CONTACT	Recording input / reference / bias
P02	REC_02	recording-front-end	J30003	2	REC01_CONTACT	Recording input / reference / bias
P03	REC_03	recording-front-end	J30003	3	REC02_CONTACT	Recording input / reference / bias
P04	REC_04	recording-front-end	J30003	4	REC03_CONTACT	Recording input / reference / bias
P05	REC_05	recording-front-end	J30003	5	REC04_CONTACT	Recording input / reference / bias
P06	REC_06	recording-front-end	J30003	6	REC05_CONTACT	Recording input / reference / bias
P07	REC_07	recording-front-end	J30003	7	REC06_CONTACT	Recording input / reference / bias
P08	REC_08	recording-front-end	J30003	8	REC07_CONTACT	Recording input / reference / bias
P09	REC_09	recording-front-end	J30003	9	REC08_CONTACT	Recording input / reference / bias
P10	REC_10	recording-front-end	J30003	10	REC09_CONTACT	Recording input / reference / bias
P11	REC_11	recording-front-end	J30003	11	REC10_CONTACT	Recording input / reference / bias
P12	REC_12	recording-front-end	J30003	12	REC11_CONTACT	Recording input / reference / bias
P13	REC_13	recording-front-end	J30003	13	REC12_CONTACT	Recording input / reference / bias
P14	REC_14	recording-front-end	J30003	14	REC13_CONTACT	Recording input / reference / bias
P15	REC_15	recording-front-end	J30003	15	REC14_CONTACT	Recording input / reference / bias
P16	REC_16	recording-front-end	J30003	16	REC15_CONTACT	Recording input / reference / bias
P17	REC_REFERENCE	recording-front-end	J30003	17	REF_CONTACT	Recording input / reference / bias
P18	BODY_BIAS	recording-front-end	J30003	18	BIAS_CONTACT	Recording input / reference / bias
P19	STIM_01	supervision	J50101	1	BODY_STIM00	After independent output guards
P20	STIM_02	supervision	J50101	2	BODY_STIM01	After independent output guards
P21	STIM_03	supervision	J50101	3	BODY_STIM02	After independent output guards
P22	STIM_04	supervision	J50101	4	BODY_STIM03	After independent output guards
P23	STIM_05	supervision	J50101	5	BODY_STIM04	After independent output guards
P24	STIM_06	supervision	J50101	6	BODY_STIM05	After independent output guards
P25	STIM_07	supervision	J50101	7	BODY_STIM06	After independent output guards
P26	STIM_08	supervision	J50101	8	BODY_STIM07	After independent output guards
P27	STIM_09	supervision	J50101	9	BODY_STIM08	After independent output guards
P28	STIM_10	supervision	J50101	10	BODY_STIM09	After independent output guards
P29	STIM_11	supervision	J50101	11	BODY_STIM10	After independent output guards
P30	STIM_12	supervision	J50101	12	BODY_STIM11	After independent output guards
P31	STIM_13	supervision	J50101	13	BODY_STIM12	After independent output guards
P32	STIM_14	supervision	J50101	14	BODY_STIM13	After independent output guards
P33	STIM_15	supervision	J50101	15	BODY_STIM14	After independent output guards
P34	STIM_16	supervision	J50101	16	BODY_STIM15	After independent output guards
P35	RETURN_00	supervision	J50101	17	BODY_RETURN0	After independent output guards
P36	RETURN_01	supervision	J50101	18	BODY_RETURN1	After independent output guards

Zero-based electrical names are deliberate: Stage 2 REC_01 maps to REC00_CONTACT, and STIM_01 maps to BODY_STIM00. P35/P36 map to BODY_RETURN0/BODY_RETURN1 after the guards. Full integrated net names, geometric mate axes and source hashes are retained in body-port-bridge.csv and harness/contract.json.

Digital reference + conditional implant concept. No physical, hermetic, anatomical or biological qualification.

PROJECT SCCI RH

Mechanical review - evidence and remaining qualification

Finite digital verification closes this stage; physical and biological claims remain explicitly separate.

NATIVE AUTHORITY

FreeCAD assemblies preserve the actual eight populated STEP compounds by rigid translation. Separate editable mechanical construction features define the chassis, mounts, housing cavities, package, bores and lead interfaces.

INDEPENDENT VERIFICATION

A separate inspector reopens saved native/STEP BReps, compares placed solids to original source boards, derives hole axes from native KiCad files and checks material intersections, declared clearances and port identities.

WIRING TRACEABILITY

83 mating housing envelopes correspond to 78 internal and 5 external interfaces. All 258 original wiring rows and 47 branched nodes are preserved. Shared rows do not imply several wires forced into one terminal.

CABLE PLANNING BOUNDARY

The separate route document contains nonphysical unsmoothed centerlines, a 5 mm bend allocation and length estimates with 20 percent service slack plus 30 mm termination allowance. It is not a collision-free packed loom, bend verification or wire cut list.

UNQUALIFIED MECHANICAL WORK

No load/preload, material fatigue, environmental ingress, drop, sterilization, hermetic leakage, biocompatibility, RF, thermal or manufacturing process test has been performed.

UNQUALIFIED ELECTRONICS WORK

No assembly, flashing or physical analog measurement is claimed. Native ERC/DRC and target-linked firmware establish digital design artifacts; they do not establish working implanted hardware.

CONSUMER MECHANISM

The proposed consumer practices a task while a personalized controller estimates relevant spinal state and applies bounded timing assistance; retained learning is assessed with assistance off. Function-specific physiological feedback uses its own selected sensor/pathway/policy.

CREDIT AND NEXT STAGE

AstroSam Mind-Link inspired the progression from a future interface idea to inspectable electronics and a physical design identity. Project SCCI RH contributes its own spinal architecture and mechanisms. Stage 6 integrates the illustrated paper and final private repository release; video and website remain parked.

SOURCE INDEX

assembly-contract.json / reference/contract.json / future-interface/contract.json / harness/contract.json / provenance/stage5-*.json