

Systemics Minimal Specification (K1)

References

- GraphFrame K0 (GF0) (spec://_kernel/gf/gf0-k1)
- SpecFrame K1 (spec://_kernel/spec/specframe-k1)
- Composition (separate spec) (spec://domains/systemics/sigma-composition-k1)

1 Charter

Charter

specifies a contract-shaped kernel that produces decisions from posted evidence under benign variation, with replayable records, without making domain assumptions.

2 Alphabet (Objects & Maps)

Alphabet

- U : universe of artifacts
- V : valuation space (any measurable space; commonly $\mathbb{R}^k \in \mathbb{B}^m$)
- $\mathbb{2}$: decision space $\mathbb{2} := \{0,1\}$
- γ : frames / benign contexts
- P_n : probes / benign perturbations
- γ : floors/thresholds (partially ordered set)
- γ : invariance budgets (tolerances in a poset/lattice)
- C : capacity budgets (bits/time/energy constraints)
- γ : envelope/meta (versions, seeds, numeric modes, commits)
- R : records (canonical map bytes; hash/ledger optional)

3 Definition: Systemic Kernel

Systemic Kernel

A systemic kernel is the tuple: $K_{\gamma} := (v, \gamma, P_n, \gamma, C, \gamma)$, where $v: U \rightarrow V$ and $\gamma: V \in \mathbb{B} \rightarrow \mathbb{2}$.

4 Metrics & Order

Wobble and orderings

assumes a divergence ("wobble") $w: V \subseteq V \rightarrow \mathbb{R}_{\geq 0}$ on decision-relevant coordinates. Orders: \succ means tightening floors; \succ' means tightening budgets; $C' \preceq C$ means shrinking capacity.

5 Axioms (Minimal Core)

-A1 Well-typedness

All maps are measurable/continuous as needed; π is total on $V \subseteq \mathbb{R}^n$.

-A2 Posting / Records-only

For any run on $u \in U$, the record R contains $(v(u), \pi, C, P_n)$, and the decision equals $\pi^*(u; \pi) = (v(u), \pi)$, with no dependence on unposted data.

-A3 Benign invariance

Let $(p) \in P_n$ act on the measurement/evaluation pathway to yield $v_{\{p\}}(u)$. Define $W(u) := \sup_{(p)} w(v_{\{p\}}(u), v_{\{0,p0\}}(u))$. If $W(u) < \infty$ then for all benign (p) , $(v_{\{p\}}(u), \pi) = (v_{\{0,p0\}}(u), \pi)$.

-A4 Minimal sufficiency under capacity

Among valuations preserving decisions under posted (π, π) , v is minimal w.r.t. capacity cost subject to C : for all v' , $(v' = v) \text{ cost}(v') \leq \text{cost}(v)$, subject to C .

-A5 Reflexive reproducibility

There exists an admissible, independently realized v' (different numeric/route) such that $(v(u), \pi) = (v'(u), \pi)$, with both posted in π (self-warrant).

-A6 Determinism & idempotence

For fixed $(v(u), \pi)$, the decision π is unique and idempotent under re-evaluation.

-A7 Monotonicity

Tightening floors or budgets cannot rescue a failure by hidden dependence. For π and π' , $(v, \pi) = 1$ implies $(v, \pi', \pi') \in \{0,1\}$ with no hidden rescue: tightening must not create a pass whose justification depends on data not posted in the record.

-A8 Isomorphism invariance

If a frame π induces a structure-preserving isomorphism on representation, decisions are invariant.

6 Conformance (Lawful Record)

-lawful record checklist

A record \mathcal{R} is -lawful iff it includes: (1) contract $(\mathcal{C}, \mathcal{P}_{\text{in}}$, and guards), (2) valuation $v(u)$ (decision-relevant coords), (3) decision $(v(u), \mathcal{C})$ with reasons, (4) invariance evidence (wobble metrics + worst-case (p)), (5) reflexive warrant $(v'(u)$ and agreement), (6) canonicalization: canonical bytes, digest d , and optional chain root.

7 Morphisms of Systemics

Morphism preservation

A morphism preserves valuation and decision structure by satisfying: $v' \circ \mathcal{U} = \mathcal{V} \circ v$, $' \circ (\mathcal{V} \circ \text{id}) = \mathcal{V}$. It also maps contract parameters monotonically and preserves -A1..-A7.

Morphism \mathcal{F} : $'$

A morphism \mathcal{F} : $'$ is a pair $(\mathcal{U}, \mathcal{V})$ such that the following commutation laws hold: $v' \circ \mathcal{U} = \mathcal{V} \circ v$, and $' \circ (\mathcal{V} \circ \text{id}) = \mathcal{V}$. A morphism also maps contracts monotonically so that \mathcal{C} axioms remain satisfied.

8 Instantiation Recipe (Domain-Agnostic)

Recipe

Choose $\mathcal{U}, \mathcal{V}, v$; post $\mathcal{C}, \mathcal{P}_{\text{in}}$, and wobble metric w ; establish -A1..-A7 by construction/tests; emit \mathcal{R} and optionally chain pages into books.

9 Notes

Notes

This specification does not fix what v measures, what \mathcal{C} decides, or how w is computed. It only requires posting, invariance under benign variation, minimal sufficiency under capacity, and reflexive reproducibility. Evidence Systemics is one instantiation where v encodes evidence gauges; other instances (Control, Protocol, Risk, Learning, etc.) keep the same \mathcal{C} contract while choosing different $v, \mathcal{C}, \mathcal{P}_{\text{in}}$.