MODULIGN

Standard

A Dimensional Address Grammar for Observable Reality

FULL SPECIFICATION · VERSION 3.0

Authored by

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Preamble

Modulign was conceived in 2026 by Vincent Gonzalez during the development of a live-stream atlas of Earth built as a single static HTML file. The problem was simple on its surface: how do you organize thousands of live video feeds from across the planet so that a human can navigate them with a dial and a machine can query them in milliseconds? No existing system answered both requirements simultaneously. GPS encodes location but not context. MIME types encode medium but not place. ISO 8601 encodes time but not activity. Every domain had its own classification silo and none of them talked to each other.

Modulign is the answer to all of them simultaneously. It is not a tagging system, a taxonomy, or a database schema. It is an address grammar — a coordinate system for any observable phenomenon in the physical universe, at any scale, with explicit causal, epistemic, temporal, jurisdictional, and relational encoding.

Version 3.0 incorporates a full architectural expansion: the Scale axis (from Planck-scale quantum events to the cosmological horizon), the Observer axis with domain competence encoding, the Jurisdiction axis, the Causal Relation Registry, the Entity Registry, the Background Domain annotation for genuinely dual-subject observations, a formalized Majority Threshold for Dominance Resolution, a three-layer Trust Architecture, and a DNS-style federated backend model capable of supporting trillions of entries at near-zero infrastructure cost.

Version 3.0 also carries a philosophical foundation that was an accidental discovery in the course of technical work. In formalising the Modulign Decision Protocol as an epistemological architecture, the system was found to provide a structural dissolution of the Gettier problem — the sixty-year unsolved problem in analytic epistemology concerning what it means to know something. The Address-Theoretic Non-Accidentality Principle (ATNA) and the Address-Theoretic Knowledge (ATK) formulation are documented in Section 31. They are consequences of the architecture, not motivations for it.

1 · Design Principles

1.1 Modularity

Each segment of a Modulign code is a self-contained module with an independent semantic meaning. No segment's meaning depends on another's value. Updates to one axis do not invalidate others.

1.2 Alignment

Every code is a calibrated position statement derived from the mandatory Decision Protocol. A Modulign code produced without following the Protocol is not a valid Modulign code — it is an approximation. The word "alignment" carries two simultaneous meanings: spatial alignment (locating an observation in the physical universe) and epistemic alignment (ensuring every segment reflects the most accurate currently-available classification).

1.3 Permanence and Mutability

The GSI-ID (permanent unique identifier) never changes. The Classification Layer code changes when the underlying reality changes. Historical classification records are never deleted — only superseded by newer records with later timestamps.

1.4 Expressiveness at Minimum Length

A minimum valid Modulign code — containing only namespace, domain, subdomain, locus chain, and node — is fully compliant and immediately useful. Every additional suffix adds precision without invalidating the base code.

1.5 Universal Spatial and Scale Reach

Version 3.0 addresses any observable phenomenon from Planck scale (10^{-35}m) to cosmological scale (10^{26}m), in any realm from ocean trenches to lunar craters to the outer solar system to virtual environments.

1.6 Eyeball Verifiability

Rules that require precise measurement to apply are replaced with rules a trained human can verify by observation. The Majority Threshold for Dominance Resolution requires only that the subject occupy more than half of the semantically significant frame — no measurement tools required.

1.7 Open Standard

Modulign is published as an open specification. Any individual, organization, or system may implement a Modulign-compliant classifier without license, fee, or permission. The name Modulign™ and the MGN· prefix are trademarks of Vincent Gonzalez. Implementations must not misrepresent compliance with this specification.

2 · Architecture Overview — The Three Registries

Every observable entity in the Modulign system exists across three coordinated registries sharing one namespace and one identifier format. Together they constitute the Reality Graph — the structured, queryable record of the observable world.

Registry	Identifier	Contents	Mutability
Observation Registry	GSI-ID (UUID-v4)	Canonical MGN code, classification history, reasoning records, confidence scores, meta flags	Dynamic classification layer; permanent identity layer
Entity Registry	EID (typed identifier)	Persistent entities with identity across observations: people, institutions, species, structures	Entity core permanent; attributes update as entity changes
Relation Registry	RID (relation record)	Typed causal and temporal links between two GSI-IDs or EIDs, with own timestamp, observer, and confidence	Append-only for ^EVID; mutable for provisional

Each observation accumulates an Observational Ledger: the complete timestamped history of every MGN code ever assigned to its GSI-ID. The Observational Ledger of an EID is the complete history of observations associated with that entity across all GSI-IDs that reference it.

3 · Canonical Code Format v3.0

3.1 Full Syntax

The complete Modulign v3.0 address syntax:

```
MGN·[DOM·SUB]·[REALM/G1/G2/G3/G4]·[NOD]·|SCL|·:[MED]·%[OBS]·[CAM][ACT]@[TIME]·§[JUR]·^[META]·~[DYN]·+[BG]
```

```
REQUIRED:   MGN·  DOM·SUB  REALM/G1/G2/G3/G4  NOD
OPTIONAL:   |SCL|  :MED  %OBS  CAM  ACT  @TIME  §JUR  ^META  ~DYN  +BG
RELATIONAL:  GSI-A →[REL]→ GSI-B  (Relation Registry record)
ENTITY:      EID·[TYPE]·[SCOPE]·[NOD]  (Entity Registry)
```

3.2 Segment Reference

Segment	Token	Format	Req.	Description
Namespace	MGN·	Fixed prefix	Yes	Always first. Never omitted.
Domain	[DOM]	3 uppercase letters	Yes	Primary functional context. 9 domains.
Subdomain	[SUB]	3 uppercase letters	Yes	Refinement within domain.
Realm	[REALM/]	2 letters + slash	Yes*	Spatial realm. SR/ implied if omitted for surface.
Locus G1–G4	[G1/G2/G3/G4]	Slash-separated codes	Yes	Global → Country → State → City.
Node	[NOD]	4 Base-36 chars	Yes	Unique instrument/site within locus scope.
Scale	|SCL|	Pipe + 3 letters + pipe	Rec.	Scale tier. |HMN| implied if omitted.
Medium	:[MED]	Colon + 3 letters	Rec.	Type of observation. :VID implied for video.
Observer	%[OBS]	Percent + type + competence	Rec.	Who classified, competence level, consensus count.
Camera/Instr.	.[CAM]	Dot + 1 letter	Opt.	Physical capture device characteristics.
Activity	-[ACT]	Dash + 1 letter	Opt.	Dominant observable activity.
Time	@[TIME]	@ + letter or ISO8601	Opt.	Temporal context.

Segment	Token	Format	Req.	Description
Jurisdiction	§[JUR]	Section + code	Opt.	Governing legal framework.
Meta flags	^[META]	Caret + word	Opt.	Operational status. Repeatable.
Continuum	~[DYN]	Tilde + 3 letters	Opt.	Temporal behavior pattern.
Background	+[DOM·SUB]	Plus + domain·subdomain	Opt.	Secondary domain when genuine duality exists.

3.3 Minimum Valid Code

MGN·URB·STR·SR/NA/US/NY/NYC·00A1

Four required segments. Fully compliant. Immediately useful.

3.4 Fully Annotated Code

MGN·TRN·RAL·SR/NA/US/FL/FMY·0042·|HMN|·:VID·%HUM·URB:T×3·.A-T@R·§US-FL·^VFYD·~CYC

Transport · Rail · Surface/N.America/USA/Florida/Fort Myers · Human scale · Video · Human, Urban trained, 3-way consensus · Fixed · Transit · Rush · Florida law · Verified · Cyclical

4 · The Namespace Prefix — MGN·

The prefix MGN· (Unicode U+004D U+0047 U+004E U+00B7) precedes every valid Modulign code. It serves four functions: disambiguation from all other identifier formats; namespace isolation in mixed-identifier databases; version tagging for future major versions; and immediate human recognition.

The middle dot (·, Unicode U+00B7) is the primary segment separator throughout the Modulign standard. In systems where U+00B7 cannot be rendered, a period (.) is the approved ASCII fallback. When using ASCII fallback: a period followed by one uppercase letter is always a Camera/Instrument type prefix; a period followed by three uppercase letters is always a segment separator.

5 · Domain Definitions

The Domain segment encodes the primary designed or sanctioned purpose of the observed space — not its current appearance. A street market is Domain COM even though it occupies a street. A protest in a park is Domain EVT even though the park is normally NAT or URB. The designed purpose governs unless a temporary activity overrides it at majority scale.

Code	Full Name	v1.0	Primary Scope
URB	Urban / Built Environment	100	Streets, parks, plazas, building exteriors and public interiors, skylines, underground urban infrastructure.
NAT	Natural World	200	Wilderness, coastlines, weather systems, geological formations, open ocean, forests, mountains, polar regions, atmosphere.
TRN	Transportation Systems	300	Rail, road, air, maritime, pipeline, and micro-mobility networks.
COM	Commerce & Industry	400	Markets, factories, warehouses, financial districts, agricultural operations, mining sites, energy production.
RES	Residential / Private Life	500	Residential neighborhoods, domestic exteriors, private community spaces. Strict consent requirements apply.
EVT	Events & Entertainment	600	Concerts, sports, festivals, conferences, ceremonies. Applies when a bounded event overrides the space at majority scale.
SEC	Security & Surveillance	700	Dedicated security cameras, law enforcement monitoring, correctional feeds, border monitoring, traffic enforcement.
INF	Infrastructure / Utilities	800	Power grids, water treatment, communications towers, bridges, dams, tunnels, utility monitoring.
UNK	Unknown / Mixed / Experimental	900	Unclassifiable, mixed-domain, or novel contexts. Use when classification information is genuinely insufficient.

5.1 Domain Conflict Resolution

Apply in order, stopping at first match: (1) If an active EVT overrides the space at majority scale, use EVT. (2) If the feed is from a dedicated security installation regardless of content, use SEC. (3) If transportation infrastructure is the dominant visual subject, use TRN. (4) If commercial activity clearly dominates, use COM. (5) If the natural environment is the clear and unambiguous primary subject, use NAT. (6) Otherwise, use the designed purpose of the space. When two domains are genuinely co-present, use the Background Domain annotation (+[DOM·SUB], Section 19) rather than UNK·MIX.

6 · Subdomain Registry

The Subdomain segment provides one level of refinement within the Domain. Codes are three uppercase letters, namespaced to their parent domain. If no subdomain cleanly matches, use UNK for that domain.

6.1 URB — Urban / Built Environment

Code	Name	Description
STR	Streets & Roads	Public thoroughfares, sidewalks, intersections, pedestrian zones.
PKS	Parks & Public Spaces	Urban parks, plazas, squares, public gardens, waterfronts.
BEX	Building Exterior	Facades, entrances, loading docks, rooftop overviews.
BIN	Building Interior (Public)	Lobbies, transit halls, airports, shopping centres, arenas, libraries.
SKY	Skyline / Overview	Elevated wide-angle city views. Helicopter cams.
SUB	Underground	Urban tunnels, underground stations, utility corridors.
CNX	Construction Zone	Active construction or demolition sites.
MEM	Memorial / Monument	Heritage, memorial, or landmark sites.
CMP	Campus	University, corporate, hospital, or institutional campus.
UNK	Unknown Urban	Urban context confirmed, subdomain indeterminate.

6.2 NAT — Natural World

Code	Name	Description
FOR	Forest / Woodland	Tree canopy, forest floor, woodland streams, jungle interiors, boreal forest.
CST	Coastal / Beach	Shoreline, surf zone, tidal flats, cliffs, beach environments.
OCN	Open Ocean	Open sea surface, pelagic environments, beyond the coastal zone.
RVR	Riverine / Wetland	Rivers, lakes, marshes, deltas, flood plains, mangroves.
DST	Desert / Arid	Deserts, badlands, dry scrubland, steppe, salt flats.
MTN	Mountain / Alpine	Peaks, glaciers, high-altitude terrain, volcanic environments.
ATM	Sky / Atmosphere	Weather cams, cloud systems, aurora borealis, atmospheric phenomena.
POL	Polar	Arctic and Antarctic surface, ice sheets, sea ice, polar seas.

Code	Name	Description
OBS	Observatory / Scientific	Dedicated scientific observation installations in natural environments.
GEO	Geological / Volcanic	Active volcanic zones, geothermal areas, cave systems.
UNK	Unknown Natural	Natural context confirmed, subdomain indeterminate.

6.3 TRN — Transportation Systems

Code	Name	Description
RAL	Rail Systems	Commuter rail, metro, tram, light rail, high-speed rail, stations.
ROD	Road Traffic	Highways, arterials, intersections, toll points, road tunnels.
AIR	Air Transport	Airport runways, taxiways, terminals, airspace monitoring.
SEA	Maritime	Ports, harbours, shipping lanes, canals, ferry routes.
PPL	Pipeline / Utility Transit	Pipeline monitoring, conveyor systems.
CYC	Cycling / Micro-mobility	Bicycle lanes, shared mobility, pedestrian-scale transit.
SPC	Spaceport / Launch	Launch pads, rocket assembly, spaceport operations.
UNK	Unknown Transport	Transportation context confirmed, subdomain indeterminate.

6.4 COM · RES · EVT · SEC · INF · UNK

Key subdomains — COM: MKT (Market), FAC (Factory), AGR (Agricultural), MIN (Mining), ENR (Energy), LOG (Logistics). EVT: SPT (Sports), MUS (Music/Performance), FES (Festival), CNF (Conference), CRM (Ceremony), PRO (Protest). SEC: CRT (Court), PRS (Prison), BRD (Border), POL (Police), TRF (Traffic Enforcement). INF: PWR (Power), WTR (Water), BRG (Bridge/Dam), SES (Seismic/Environmental Sensor). UNK: MIX (Mixed), SYN (Synthetic/AI-generated), EXP (Experimental). Full registry maintained at the canonical Modulign repository.

7 · The Locus Chain — Geospatial Architecture

The Locus Chain answers: where in physical space does this observation originate? It consists of a Realm Prefix followed by four cascading geographic levels (G1–G4), each more specific than the last, separated by forward slashes.

`[REALM]/[G1]/[G2]/[G3]/[G4]`

Code	Region	Geographic Scope
NA	North America	USA, Canada, Mexico, Caribbean, Central America, Greenland
SA	South America	All South American nations and territories
WE	Western Europe	EU member states west of former Iron Curtain, UK, Norway, Switzerland, Iceland
EE	Eastern Europe	Former Soviet bloc, Balkans, Baltic states, Ukraine, Belarus, Moldova
RU	Russia / Central Asia	Russian Federation, Kazakhstan, Uzbekistan, Tajikistan, Mongolia
ME	Middle East	Turkey, Levant, Arabian Peninsula, Iran, Iraq, Egypt, MENA
AF	Sub-Saharan Africa	All sub-Saharan African nations and territories
SC	South Asia	India, Pakistan, Bangladesh, Sri Lanka, Nepal, Bhutan, Maldives
SE	Southeast Asia	ASEAN nations, Myanmar, Timor-Leste, Papua New Guinea
EA	East Asia	China, Japan, South Korea, North Korea, Taiwan, Hong Kong, Macau
OC	Oceania / Pacific	Australia, New Zealand, Pacific island nations and territories
PL	Polar	Arctic zone, Svalbard, Antarctic continent and surrounding waters
UNK	Unknown / Unlocated	Region cannot be determined from available information

Country codes (G2) follow ISO 3166-1 alpha-2 compressed to uppercase two-letter codes. State/province codes (G3) follow ISO 3166-2 compressed to 2–3 letters. City codes (G4) are drawn from the Modulign Geo Registry. Sample city codes: NYC (New York City), LON (London), TOK (Tokyo), PAR (Paris), BER (Berlin), SYD (Sydney), FMY (Fort Myers), LAX (Los Angeles), MIA (Miami), CHI (Chicago), DXB (Dubai), SIN (Singapore), CPT (Cape Town), ROM (Rome).

8 · Realm Prefixes — Beyond Earth Surface

The Realm Prefix establishes the fundamental spatial context before geographic descent begins. SR/ (Earth surface) may be omitted for standard surface feeds — its absence implies SR/.

Code	Realm	Description	Example
SR	Surface (default)	Earth land surface and near-surface up to ~100m altitude.	Standard cameras, webcams, CCTV, wildlife cams
AT	Atmosphere	Earth atmosphere above surface: weather balloons, drones above 100m, atmospheric monitoring.	AT/NA/US/FL/HRC — Hurricane Center sensor
SS	Subsurface	Underground: mines, tunnels, caves, underground infrastructure.	SS/WE/FR/IDF/PAR — Paris Metro tunnel
AQ	Aquatic	Open water at or near surface: ocean, lake, river, shallow coastal.	AQ/EA/PA/NPA — North Pacific buoy
DQ	Deep Aquatic	Submarine and deep-sea: ROV feeds, deep-sea sensor arrays.	DQ/OC/PA/MRN/CHG — Mariana Trench
OR	Orbital	Earth orbit: LEO, MEO, GEO, HEO, Lagrange points.	OR/L2/JWT — James Webb Space Telescope
LN	Lunar	Moon surface and lunar orbit.	LN/NEA/OCN/SHK — Oceanus Procellarum
IP	Interplanetary	Beyond lunar orbit: Mars, Venus, asteroids, deep space probes.	IP/MRS/OLY — Olympus Mons, Mars
VR	Virtual / Synthetic	Fully simulated or generated environments. Required with :SYN medium.	VR/SIM/GEN/AI1 — AI-generated scene

9 · Node System (Base-36)

The Node is a four-character identifier for a specific camera, sensor, or observable site within its Locus scope. Version 3.0 uses Base-36 encoding (digits 0–9 and letters A–Z, uppercase, excluding O and I to avoid confusion with 0 and 1). Base-36 provides 36^4 = 1,679,616 unique nodes per Locus scope — 168× more than four decimal digits.

Nodes are locally scoped: node 0042 in Fort Myers is a completely different entity from node 0042 in Tokyo. Nodes are assigned sequentially within their Locus scope by the Modulign Registry or a delegated regional authority. Decommissioned nodes receive the ^DEAD flag and their numbers are permanently retired. Node 0000 is the universal unregistered node. Node XXXX is reserved for system use.

10 · The Scale Axis

The Scale axis |SCL| is an independent dimension of observable reality. It encodes which tier of physical reality the observation is sampling. A blood sample at cellular scale and a street camera at human scale can share identical domain codes — without the Scale axis, they are indistinguishable to a machine. The scale is not a subdomain. It is a separate axis.

Code	Scale Tier	Range	Example Observations
`|QNT|`	Quantum / subatomic	Below ~10^{-10}m	Electron tunneling detectors, particle collision data, quantum sensor readings
`|MLC|`	Molecular / cellular	10^{-10} to 10^{-5}m	Electron microscopy, cellular imaging, molecular sensor arrays, DNA sequencing feeds
`|BIO|`	Biological organism	10^{-3} to 10^{1}m	Medical imaging, wildlife cameras, ecological field observations, clinical monitoring
`|HMN|`	Human / built environment	10^{1} to 10^{3}m	Standard cameras, CCTV, webcams, sensors — the default scale. Implied if |SCL| omitted.
`|GEO|`	Geological / planetary	10^{3} to 10^{7}m	Satellite imagery, seismic arrays, atmospheric monitoring networks, geological survey
`|STL|`	Stellar / solar system	10^{8} to 10^{13}m	Telescope feeds, orbital sensor arrays, solar wind monitoring, planetary probes
`|CSM|`	Cosmological	10^{13}m and beyond	Gravitational wave detectors, CMB arrays, dark matter lensing surveys, deep field imaging

The Scale axis is architecturally required for the ATK formulation's scale-sensitivity condition (Section 31). Knowledge-grade observation requires that the classification procedure operate at the scale at which the truth-making conditions are constituted. A human-scale visual glance cannot constitute knowledge-grade barn identification in a façade-dense environment because the epistemically relevant features exist at regional scale — above |HMN|.

11 · The Medium Axis

The Medium axis :[MED] encodes what type of observation this is. Default is :VID, which may be omitted for video-only systems. Any code using :SYN must use VR/ as its Realm Prefix — the combination VR/ + :SYN is the definitive Modulign signature for synthetic content.

Code	Medium	Description
:VID	Video Stream	Moving image, real-time or recorded. The default medium.
:AUD	Audio Only	Sound recording without visual component. Radio, acoustic sensors.
:SAT	Satellite Imagery	Images from Earth-observation satellites.
:SEN	Sensor Data	Non-visual measurement: temperature, pressure, seismic, radiation, humidity.
:TXT	Text / Document	Written records, transcripts, legal documents, data reports.
:IMG	Still Image	Single-frame photography or snapshot.
:MDL	3D Model / Scan	LIDAR, photogrammetry, point clouds, volumetric data.
:BIO	Biological / Medical	Life-science observations: medical imaging, genomic data, ecological surveys.
:DAT	Raw Data Stream	Abstract telemetry, API feeds, numerical data streams.
:MDX	Mixed Media	Single address encompassing multiple simultaneous medium types.
:SYN	Synthetic / AI-Generated	Media produced by generative AI, CGI, or simulation. Requires VR/ Realm.

12 · Camera and Instrument Type

The Camera Type suffix (.CAM) describes the physical characteristics of the image capture device, inferred from observable characteristics alone — never from assumption or metadata. For non-visual media, the dot-suffix slot encodes Instrument Type.

Code	Type	Observable Indicators / Use
.A	Fixed camera	Zero motion. Stable horizon. Consistent framing.
.A2	Fixed, alternate angle	Same location as .A but different viewing angle.
.B	Mobile / handheld	Characteristic handheld shake, changing perspective, human-scale motion.
.C	Aerial / drone	Elevated viewpoint, smooth floating motion, overhead or high-angle perspective.
.D	Body camera / POV	Eye-level POV, motion correlated with walking human gait.
.E	Vehicle-mounted	Motion correlated with vehicle trajectory. Fixed relative to vehicle frame.
.F	Underwater / submersible	Underwater visual characteristics: caustics, marine fauna, pressure artifacts.
.G	Satellite / orbital imager	Wide-area top-down coverage, characteristic satellite imaging artifacts.
.H	Thermal / infrared	False-color heat rendering, characteristic thermal bloom.
.J	Multi-spectral / scientific	Non-visible-light rendering characteristics.
.M	Microphone	For :AUD medium.
.S	Environmental sensor array	For :SEN medium.
.T	Transcription system	For :TXT medium.
.L	LIDAR / point cloud scanner	For :MDL medium.
.K	Telemetry system	For :DAT medium.

13 · Activity State

The Activity State suffix (-ACT) encodes the dominant observable activity at the time of classification. Apply the decision tree strictly. Anomaly overrides everything. Event overrides transit. Transit overrides interaction. Assign one value only.

STEP 1 — Is there an Anomaly (-X)?

Unusual, atypical, or potentially significant deviation from baseline?

→ If YES: assign -X. STOP.

STEP 2 — Is there an Event (-E)?

A bounded non-routine occurrence involving the majority of the observable space?

→ If YES: assign -E. STOP.

STEP 3 — What is the dominant motion pattern?

Transit (-T): dominant movement through frame.

Interaction (-N): people actively engaging each other or the environment.

Production (-P): observable work or manufacturing. Consumption (-C): retail/leisure.

→ Assign the most dominant. STOP.

STEP 4 — Default to Idle (-I) if no pattern is detectable.

Code	State	Description
`-I`	Idle	No significant activity. Default when nothing clearly matches.
`-T`	Transit	Dominant activity is movement of people, vehicles, or cargo through the frame.
`-N`	Interaction	People actively engaging each other or meaningfully with the environment.
`-P`	Production	Observable work, manufacturing, construction, or agricultural activity.
`-C`	Consumption	Retail, dining, or entertainment consumption activity is dominant.
`-E`	Event	A bounded non-routine occurrence involving the majority of the observable frame.
`-X`	Anomaly	Unexpected, atypical, or potentially significant deviation from baseline.

14 · Temporal Modifier

The Temporal Modifier (@TIME) encodes time context as perceived from the feed itself — not from clock time. A 24-hour lit indoor arena at 3am reads @R if a game is in progress. The modifier is inferred from ambient light quality, shadow direction, activity volume relative to baseline, and any visible temporal indicators. ISO timestamps always supersede qualitative modifiers.

Code	Name	Description
`@D`	Day	Ambient daylight or daytime activity patterns clearly present.
`@N`	Night	Darkness or nighttime artificial lighting dominant.
`@R`	Rush / Peak	Peak volume: crowd density, vehicle density, or throughput significantly elevated above baseline.
`@O`	Off-peak	Measurably reduced volume relative to typical baseline for this location and time.
`@[ISO]`	ISO Timestamp	Full ISO 8601 timestamp for archival and legal use. Format: @2026-03-25T14:32:17Z
`@[ISO]/[ISO]`	ISO Duration	ISO 8601 interval. Format: @2026-03-25T14:00Z/2026-03-25T16:00Z

15 · The Observer Axis and Domain Competence

The Observer axis %[OBS] encodes what type of classification procedure produced this code, how many independent observers contributed to consensus, and the competence level of the observer in the relevant domain.

Code	Type	Description
%HUM	Human observer	A human classifier applying the Decision Protocol.
%AUT	Automated system	A calibrated automated system: AI, instrument array, computer vision pipeline.
%HYB	Hybrid	Human-machine hybrid: AI-assisted human review.
%ADV	Adversarial conditions	Observer under duress, interference, or time pressure. Reduces confidence weight.
%UNK	Unknown observer	Observer type cannot be determined.

Append ×[N] to encode independent consensus count: %HUM×3 = three independent human classifiers in consensus. The registry records whether submissions were independent and whether they agreed at segment level. Divergence is a first-class data point, not an error to suppress.

15.1 Domain Competence Qualifier

Append ·[DOM]:[LEVEL] to encode the observer's competence in the relevant domain. Three levels:

Code	Level	Description	Eligibility for ^EVID
:T	Trained	Has applied the full Decision Protocol in this domain at least once under supervision. Minimum for non-provisional classification.	Not eligible without additional human review.
:E	Expert	Domain specialist with demonstrated classification accuracy.	Eligible with %OBS·[DOM]:E×2 (two independent expert classifiers).
:A	Authority	Registry-certified domain authority.	Eligible independently.

Any classification produced without a domain competence annotation automatically receives the ^PROV (provisional) meta flag. Provisional classifications are queryable but excluded from ^EVID eligibility and legal proceedings until reviewed by a qualified observer.

15.2 Observer Syntax Examples

Code	Meaning
%HUM·URB:T×3	Three independent human classifiers, each trained in Urban domain, consensus

Code	Meaning
`%AUT·TRN:E`	Single automated system with expert-level Transportation domain accuracy
`%HYB·NAT:A`	Human-machine hybrid, Natural World domain authority
`%HUM×1`	Single human, no domain competence declared — auto-receives ^PROV
`%AUT·|CSM|:E`	Automated system, expert-level at cosmological scale (telescope pipeline)

16 · Jurisdiction Axis

The Jurisdiction axis §[JUR] encodes which legal framework governs this observation. Modulign never makes legal determinations under that framework — it provides the address, the law provides the meaning. This separation is absolute and permanent.

Format	Description	Example
`§[ISO-2]`	ISO 3166-1 alpha-2 country code. The national legal framework.	§US — United States law
`§[ISO-2]-[subdiv]`	Country + subdivision for federal systems.	§US-FL — Florida law
`§EU-GDPR`	Named supranational framework.	§EU-GDPR — European GDPR regime
`§INTL-ICC`	International Criminal Court jurisdiction.	§INTL-ICC — ICC jurisdiction
`§AQ`	International waters. No national jurisdiction.	§AQ — High seas
`§OR`	Outer Space Treaty framework.	§OR — Orbital/space law
`§NONE`	No identifiable jurisdiction.	§NONE — Ungoverned territory or unknown

17 · Meta Flags

Meta flags (^META) describe the operational status of the feed within the Modulign system. Multiple flags may be present. The ^CONT flag is the most important for epistemic integrity — any disputed classification must carry ^CONT until human resolution, and no ^EVID classification may coexist with an unresolved ^CONT. This rule is absolute.

Code	Name	Description	Assigned By
^HOT	High Attention	Elevated viewer or query volume relative to historical baseline.	Automated system
^NEW	Newly Indexed	Node registered within 30 days. Auto-removed after 30 days.	Automated system
^TRND	Trending	Significant recent increase in attention or activity volume.	Automated system
^ALRT	Alert / Review Pending	Flagged for active human review.	Human reviewer
^DEAD	Decommissioned	Feed no longer active. Node number permanently retired.	System or operator
^VFYD	Verified	Source and geolocation confirmed by human or automated verification.	Human or verification system
^EVID	Evidence-Grade	Chain of custody established. Full requirements: Section 26.	Legal or forensic authority
^RSTR	Restricted	Feed access restricted. Code is public; feed itself is not.	Feed operator
^HIST	Historical	Describes a past observation. Feed no longer live.	Archivist or system
^CONT	Contested	Classification under dispute. Do not use for critical applications until resolved.	Human reviewer
^PROV	Provisional	Observer competence not declared or below domain threshold. Awaiting review.	Automated system
^SENS1–4	Sensitivity Level	Content requires access controls. 1=mild, 4=maximum restriction.	Content reviewer

18 · The Continuum Layer

The Continuum layer (~DYN) encodes the temporal behavior pattern of the feed — how it changes over time. It requires an observation window of sufficient length to assign accurately. Newly indexed nodes (^NEW) default to ~UNK. The Continuum Layer and Activity State are complementary but orthogonal: Activity State describes the current moment, Continuum describes the arc of time.

Code	State	Description	Pattern
~STB	Stable	Consistent, predictable baseline with low variance.	Flat or mildly oscillating. Predictable.
~CYC	Cyclical	Regular recurring patterns tied to time of day, week, or season.	Periodic oscillation. Knowable rhythm.
~ESC	Escalating	Activity measurably increasing over the observation window.	Upward trend. Uncertain peak.
~DEC	Declining	Activity measurably decreasing over the observation window.	Downward trend. Post-peak dispersal.
~ERR	Erratic	Unpredictable, high-variance. Cannot be modeled from prior patterns.	No discernible pattern.
~UNK	Insufficient Data	Feed too recently indexed to establish reliable behavioral pattern.	No pattern. Default for ^NEW feeds.

19 · Background Domain Annotation

When two domains are genuinely co-present in a single observation — not because of misclassification but because reality contains both simultaneously — the Background Domain annotation encodes the secondary domain without discarding either. The + separator (U+002B, plus sign) introduces the background domain and is not used elsewhere in the Modulign grammar.

MGN·[FG_DOM·SUB]·[LOCUS]·[NOD]·...·+[BG_DOM·SUB]

The Foreground Domain occupies the canonical DOM·SUB slot — the domain that wins Dominance Resolution under the Majority Threshold rule. The Background Domain is the domain that would apply if the foreground subject were absent. UNK·MIX remains the correct code when the foreground itself cannot be determined.

Code	Meaning
MGN·TRN·ROD·SR/NA/US/ME/FOR·0042·+NAT·FOR	Road transport is the subject (foreground). Forest is the context (background). Red truck in front of pine trees.
MGN·EVT·PRO·SR/WE/GB/ENG/LON·0019·+URB·STR	Active protest is the event (foreground). Street is the underlying domain (background).
MGN·COM·FAC·SR/EA/JP/TKY/IND·0077·+NAT·CST	Factory is the primary domain. Coastal environment is the geographical context.
MGN·NAT·FOR·SR/NA/US/ME/FOR·0042·+TRN·ROD	Forest is the primary subject. Road is the contextual infrastructure within it.

20 · Dominance Resolution and the Majority Threshold

Dominance Resolution is Protocol Step 2: determining the primary functional domain of the observed space. Version 3.0 formalizes the Majority Threshold to replace the natural-language guidance in prior versions.

Majority Threshold Rule:

A domain wins Dominance Resolution if it accounts for the majority (more than half) of the semantically significant frame area.

"Semantically significant frame area" means the foreground and actively relevant mid-ground. Neutral structural elements (sky, featureless ground plane, blank walls) do not count toward any domain's area.

Human test: "What would I describe first if asked to describe this observation in one sentence?" The domain of that description wins.

If no domain reaches majority: apply Background Domain annotation (+). The domain closest to majority takes the canonical slot; the other takes the + background slot.

If two domains are genuinely equal: dual annotation, no background flag needed.

A precise percentage threshold requires measurement tools to apply. The Majority Threshold is eyeball-verifiable: a trained observer can determine whether a subject occupies more than half of the relevant frame without a ruler. This directly strengthens the intersubjectivity requirement of ATK condition (iii)(c). For automated classifiers, the threshold is computed by semantic segmentation at >50% of semantically significant pixels.

21 · Separator Grammar

Every separator character in a Modulign code has exactly one syntactic role. No separator may be used for any purpose other than its defined role. This is what makes Modulign parseable by any text-processing system without a custom parser.

Separator	Unicode	Role	Example
·	U+00B7	Primary segment separator. Divides namespace, Domain, Subdomain, Locus, Node, suffix block.	MGN·TRN·RAL·SR/NA/US/FL·0042
/	U+002F	Locus descent separator. Exclusively within the Locus Chain.	SR/NA/US/FL/FMY
|	U+007C	Scale axis delimiters. Surrounds the Scale tier code.	|HMN| |CSM| |QNT|
:	U+003A	Medium type prefix. Exclusively introduces the Medium axis token.	:VID :SEN :TXT
.	U+002E	Camera/Instrument type prefix.	.A .B .S .T
-	U+002D	Activity state prefix.	-I -T -E -X
@	U+0040	Temporal modifier prefix.	@D @N @2026-03-25T14:32Z
%	U+0025	Observer axis prefix.	%HUM %AUT %HYB
§	U+00A7	Jurisdiction prefix.	§US-FL §EU-GDPR
^	U+005E	Meta flag prefix. Repeatable.	^VFYD ^EVID ^HOT
~	U+007E	Continuum layer prefix.	~STB ~CYC ~ERR
+	U+002B	Background domain prefix. Exclusively introduces secondary domain annotation.	+NAT·FOR +URB·STR
×	U+00D7	Consensus count separator. Within Observer annotation only.	%HUM×3
→	U+2192	Relation direction separator. Only in Relation Registry records.	GSI-A →CAU→ GSI-B

22 · The Three-Layer Architecture

22.1 Identity Layer

The GSI-ID (Global Stream Identifier) is a UUID-v4 permanent unique identifier assigned at first classification. Immutable. It anchors the Observational Ledger: the complete timestamped history of every MGN code ever assigned to this observation.

22.2 Classification Layer

The canonical MGN code string. Dynamic: updated when the underlying reality changes significantly. An automated system monitoring a live feed may emit a new code every few minutes if activity state is changing. A system monitoring a stable sensor may emit a new code once a year.

22.3 Semantic Layer (Optional)

Vector embedding, similarity cluster ID (for "find me more feeds like this"), anomaly score (0.00–1.00 measuring current state against historical baseline), and AI-generated content tags. Never embedded in the canonical code string — attached to the GSI-ID in the registry. Optional for base compliance but required for discovery and anomaly detection applications.

22.4 Layer Interaction

Each layer is the single source of truth for its own domain. Do not derive Classification Layer codes from Semantic Layer embeddings. A new Meta flag (^HOT) is a Classification Layer update; it does not trigger a Semantic Layer recalculation.

23 · The Entity Registry (EID)

The Entity Registry assigns persistent identifiers to things that have identity across observations: people, institutions, species, buildings, laws, AI systems. An EID is not a classification code — it is an identity record.

EID·[TYPE]·[SCOPE]·[NOD]

TYPE categories: PER (person), ORG (organization), BIO (biological species), STR (structure), LEG (legal instrument), AI (artificial intelligence system). SCOPE is the geographic or institutional scope of primary registration. NOD is a Base-36 serial number within that scope.

EIDs are issued demand-driven: only when referenced by at least two independent Modulign classifications. Speculative registration is prohibited. An EID is referenced from an observation via the #[EID] reference suffix:

MGN·URB·STR·SR/NA/US/NY/NYC·00TSQ·:VID·.A-T@R#ORG-NA-00047

The observation has its own GSI-ID. The organization it references has its own EID. Neither record replaces the other.

24 · The Relation Registry

The Relation Registry encodes typed causal and temporal relationships between pairs of GSI-IDs or EIDs. A relation record is a first-class epistemological artifact: it carries its own creation timestamp, its own %OBS annotation, and its own confidence score. The epistemic status of a causal claim is encoded separately from the classification status of each individual observation.

`GSI-A →[REL]→ GSI-B | EID-A →[REL]→ EID-B | GSI-A →[REL]→ EID-B`

Code	Relation	Description	Evidence Required
`→CAU→`	Causal predecessor	A causally produced B. The strongest relation type.	Documented causal mechanism or expert consensus
`→SEQ→`	Temporal sequence	A preceded B in time. Causation not asserted.	Confirmed timestamps of both records
`→DRV→`	Derivation / provenance	B is derived from A (copy, processing, transformation).	Chain of custody documentation
`→COR→`	Correlation	A and B co-vary. No causal direction asserted.	Statistical or observational co-occurrence evidence
`→CNT→`	Contradiction	A and B are conflicting observations of the same purported state of affairs.	Both records present with incompatible classifications
`→PAR→`	Parallel observation	A and B are independent observations of the same event from different instruments.	Overlapping timestamps and geographic proximity

25 · Classification Decision Protocol

The Classification Decision Protocol is the mandatory sequence of steps that produces a valid Modulign code. A code produced outside this protocol is not a valid Modulign code — it is an approximation and must be labeled ^PROV.

STEP 1 — Scene Parsing

Identify environment type. Detect all agents. Map motion patterns. Note dominant visual elements. Identify linguistic or geographic cues in the frame.

STEP 2 — Dominance Resolution

Apply the Majority Threshold rule (Section 20). Determine foreground Domain and Subdomain. Apply Background Domain annotation if dual presence is confirmed.

STEP 3 — Locus Resolution

Identify Realm. Descend GeoChain from G1 to G4. Use UNK at any level where resolution cannot be achieved. Assign or confirm Node.

STEP 4 — Scale Assignment

Identify the Scale tier from instrument characteristics and observable features. Assign |SCL| from the Scale Registry.

STEP 5 — Medium Assignment

:VID may be omitted for video-only systems. For all other media, the Medium code is required.

STEP 6 — Suffix Assembly

Apply Camera/Instrument Type. Apply Activity State via decision tree (Section 13). Apply Temporal Modifier. Apply Observer annotation with domain competence. Apply Jurisdiction. Apply Meta Flags. Assign Continuum state if observation window is sufficient.

STEP 7 — Conflict Elimination

Verify no two segments encode identical information. Verify Activity State and Continuum are not logically contradictory. Verify Realm and Domain are consistent (OR/ with NAT·SKY is valid; OR/ with URB·STR is not).

STEP 8 — Emit

Output canonical code string. Output full JSON record with confidence score, segment-level reasoning, and %OBS annotation. Store against GSI-ID with ISO timestamp.

Score Range	Interpretation	Action
0.95–1.00	High confidence. All segments confirmed from clear evidence.	Accept. No review required for routine use.
0.80–0.94	Good confidence. One or more segments inferred with minor ambiguity.	Accept. Flag for periodic review.
0.60–0.79	Moderate confidence. Multiple inferred segments.	Accept with ^CONT flag. Queue for human review within 24 hours.
Below 0.60	Low confidence. Significant uncertainty in one or more primary segments.	Do not publish without human review. Mark ^PROV.

26 · Trust Architecture and Registry Integrity

At scale, the Modulign registry faces three attack vectors: registry poisoning (fake node registrations), classification laundering (false entries in a legitimate node's history), and fork poisoning (malicious derivative implementations producing incompatible codes that appear valid). Version 3.0 implements a three-layer Trust Architecture to address all three.

26.1 Content-Addressed Registry Entries

Every registry entry is stored with a SHA-256 hash of its content at the time of registration. Any modification changes its hash. Modified entries are automatically flagged. The hash is stored alongside the entry — the entry itself remains human-readable. This does not prevent modification; it makes modification detectable.

26.2 The Append-Only Ledger (^EVID Grade)

Standard classifications use mutable logs: entries can be superseded by newer entries with later timestamps. Evidence-grade classifications (^EVID) use an append-only ledger: no classification can be deleted or modified after emission — only superseded by a new record with a later timestamp and a cryptographic signature chain. The signed ledger is the chain of custody. The append-only ledger is required only for ^EVID-grade classifications.

26.3 Fork Identification

The MGN· prefix is the canonical Modulign namespace. Any fork using a different prefix (MGN2·, XMG·, etc.) must declare its parent version and the SHA-256 hash of the parent spec document. Every canonical Modulign implementation must state which version of the Modulign Standard it implements and include the hash of that spec document. Implementations that cannot provide this hash are not Modulign-compliant.

26.4 Registry Poisoning Defense

Node registrations require a minimum of two independent observations from the claimed Locus scope before a GSI-ID is confirmed. Unconfirmed nodes carry ^NEW. A node whose classification history becomes inconsistent with its registered Locus and Domain is automatically flagged ^ALRT for human review.

27 · Machine Output Format

Every Modulign-compliant classifier must emit a structured JSON record alongside every canonical code string. All fields are required unless marked optional.

```
{
  "modulign_version": "3.0",
  "gsi_id": "9F3A22BC-88D1-4C3E-B7A2-005E14720A91",
  "code": "MGN·TRN·RAL·SR/NA/US/FL/FMY·0042·|HMN|·:VID·%HUM·URB:T×3·.A-
T@R^HOT~CYC",
  "timestamp_utc": "2026-03-25T14:32:00Z",
  "confidence": 0.94,
  "classifier": "human",
  "registry_hash": "sha256:a7f3b2c1...",
  "segments": {
    "domain":    { "code": "TRN", "label": "Transportation", "numeric_v1":
"300" },
    "subdomain": { "code": "RAL", "label": "Rail Systems" },
    "locus":     { "realm":"SR","g1":"NA","g2":"US","g3":"FL","g4":"FMY" },
    "node":      { "code": "0042", "label": "SW Florida Rail Hub" },
    "scale":     { "code": "|HMN|", "label": "Human / built environment" },
    "medium":    { "code": "VID", "label": "Video Stream" },
    "observer":  { "type": "%HUM", "domain_competence": "URB:T", "consensus":
3 },
    "camera":    { "code": ".A", "label": "Fixed camera" },
    "activity":  { "code": "-T", "label": "Transit" },
    "time":      { "code": "@R", "label": "Rush / Peak" },
    "meta":      [ { "code": "^HOT", "label": "High Attention" } ],
    "continuum": { "code": "~CYC", "label": "Cyclical" }
  },
  "reasoning": [
    "Domain TRN: primary subject is rail infrastructure and passenger flow",
    "Scale |HMN|: standard human-perceptible observation at platform height",
    "Observer: three independent %HUM·URB:T classifiers reached consensus",
    "@R: crowd density elevated; matches known AM rush pattern for this node",
    "~CYC: 90-day observation confirms regular AM/PM peak cycles"
  ],
  "background_domain": null,
  "entity_references": [],
  "layer_3_optional": {
    "embedding_id": "emb_7a2b9c...",
    "similarity_cluster": "cluster_transit_urban_rush",
    "anomaly_score": 0.12
  }
}
```

28 · Worked Examples — Full Depth

Example 1 — Times Square, New York City

MGN·URB·STR·SR/NA/US/NY/NYC·00TSQ·|HMN|·:VID·%HUM·URB:T×3·.A-T@R^HOT~CYC

Urban · Street · Surface/N.America/USA/New York/NYC · Human scale · Video · Three human classifiers, Urban trained, consensus · Fixed · Transit · Rush · Hot · Cyclical

Example 2 — London Criminal Court Legal Transcript

MGN·SEC·CRT·SR/WE/GB/ENG/LON·0012·|HMN|·:TXT·%HUM·SEC:E·.T-N@D·§GB^EVID^VFYD~STB

Security · Court · Surface/W.Europe/UK/England/London · Human scale · Text document · Human expert, Security domain · Transcription · Interaction · Day · British law · Evidence-grade · Verified · Stable

Example 3 — Red Truck in Front of Pine Forest (Duality Case)

MGN·TRN·ROD·SR/NA/US/ME/FOR·0042·|HMN|·:VID·%HUM·TRN:T·.E-T@D~STB·+NAT·FOR

Transport · Road · Surface/N.America/USA/Maine/Forest road · Human scale · Video · Trained in Transport · Vehicle-mounted · Transit · Day · Stable · BACKGROUND: Natural/Forest

The truck occupies the majority of the semantically significant frame (foreground). The forest is the context (background). Both domains encoded. UNK·MIX is not required.

Example 4 — Gravitational Lensing Array (Dark Matter Survey, Cosmological Scale)

MGN·NAT·OBS·SR/SA/CL/ATK/CER·VLCR·|CSM|·:SEN·%AUT·NAT:E·.S-I@D^VFYD~STB·§CL

Natural · Observatory · Surface/S.America/Chile/Atacama/Cerro Rubin · Node VLCR · Cosmological scale · Sensor · Automated expert in Natural domain · Environmental sensor · Idle · Day · Verified · Stable · Chilean law

The observation is the gravitational lensing measurement. The dark matter whose distribution it evidences is not itself addressed — that is the derivation step (Section 31). The observation has a precise, permanent, intersubjective address at cosmological scale. The inference from the observation to dark matter presence is a separate epistemic act governed independently by scientific inference principles.

Example 5 — ISS Earth-Facing Camera (Orbital, Geological Scale)

MGN·NAT·SKY·OR/LEO/ISS·0001·|GEO|·:VID·%AUT·NAT:A·.G-I@D^VFYD~STB·§OR

Natural · Sky · Orbital/Low Earth Orbit/ISS · Geological scale · Video · Automated authority · Orbital imager · Idle · Day-lit · Verified · Stable · Outer Space Treaty jurisdiction

Example 6 — Mariana Trench ROV (Deep Aquatic)

MGN·NAT·OCN·DQ/OC/PA/MRN/CHG·0001·|HMN|·:VID·%AUT·NAT:E·.F-I@N^VFYD~STB·§INTL-UN

Natural · Open Ocean · Deep Aquatic/Pacific/Mariana/Challenger Deep · Human-scale ROV camera · Automated expert · Underwater cam · Idle · Night-equivalent · Verified · Stable · International waters

Example 7 — Hurricane Sensor Network (Atmospheric, Escalating)

MGN·NAT·ATM·AT/NA/US/FL/HRC·0003·|GEO|·:SEN·%AUT·NAT:E·.S-X@D^ALRT~ESC·§US-FL

Natural · Atmosphere · Atmospheric layer/USA/Florida/Hurricane Center · Geological scale · Sensor · Automated expert · Environmental array · Anomaly · Day · Alert/Review pending · Escalating · Florida law

Example 8 — AI-Generated Synthetic Scene

MGN·UNK·SYN·VR/SIM/GEN/AI1·0001·|HMN|·:SYN·%AUT·UNK:T·.A-I@D~ERR

Unknown · Synthetic · Virtual/Simulation/Generated/AI Instance 1 · Synthetic medium · Automated trained · Fixed perspective · Idle · Day-equivalent · Erratic

VR/ Realm + :SYN Medium together are the definitive Modulign signature for synthetic content. Any downstream system immediately identifies this as AI-generated without parsing the full code.

Example 9 — Medical MRI (Biological Scale, Evidence Grade)

MGN·COM·MED·SR/NA/US/FL/FMY·0088·|BIO|·:MDL·%HUM·COM:E·.L-P@D^EVID·§US-FL

Commerce · Medical · Surface/USA/Florida/Fort Myers · Biological scale · 3D model/scan · Human expert in Medical domain · LIDAR-equivalent (MRI) · Production · Day · Evidence-grade · Florida law

Example 10 — Quantum Tunneling Detection Event (CERN)

MGN·NAT·OBS·SR/WE/CH/GEN/CER·CERN·|QNT|·:SEN·%AUT·NAT:A·.S-E@D^VFYD·§CH

Natural · Observatory · Surface/W.Europe/Switzerland/Geneva/CERN · Quantum scale · Sensor · Automated authority · Environmental sensor · Event · Day · Verified · Swiss law

29 · Edge Cases and Conflict Resolution

Edge Case	Rule	Example
Natural environment during large event	Use EVT·FES if the event occupies the majority of visible natural space.	Forest concert filling the frame → EVT·FES. Hike in a forest → NAT·FOR.
Security camera in a transport hub	If dedicated security installation, use SEC regardless of content.	Police CCTV in a train station → SEC·TRF. Station's own platform camera → TRN·RAL.
Factory during workers' protest	If protest occupies majority of observable space, use EVT·PRO.	Protesters filling the factory gate frame → EVT·PRO.
Drone crossing multiple domains	Assign domain of majority visual subject at time of classification. Update as drone moves.	Drone over city → URB. Same drone moving to forest → NAT·FOR.
Disputed territory	Use de facto administrative authority's code. Add ^CONT. Never make a political determination.	Contested region → controlling authority code + ^CONT.
Observer without domain knowledge	Classification without domain competence annotation → ^PROV auto-flag.	Naive observer classifies farm building → ^PROV until confirmed by :T observer or higher.

30 · Boundary Conditions — What Modulign Does Not Address

Modulign is a Dimensional Address Grammar for Observable Reality. Three permanent boundary conditions apply. These are not gaps to be filled by future versions — they are correct scope conditions for any honest epistemological framework applied to the observable world.

30.1 Abstract and Mathematical Truths

Mathematical truths (2+2=4), logical relations, and purely definitional claims have no observable manifestations in the sense required by Modulign classification. A proof-document has a Modulign address as a :TXT observation. The mathematical truth it proves does not.

30.2 First-Person Conscious Experience

Qualia, phenomenal consciousness, and the subjective texture of experience cannot be classified in a third-person coordinate system without category error. A brain scan (:MDL or :BIO medium) is observable and Modulign-addressable. The conscious experience of having that brain scan is not. This boundary is permanent.

30.3 Purely Relational Abstract Entities

The Pythagorean theorem, Fermat's Last Theorem, and the axioms of set theory are addressed via their documentary artifacts (:TXT observations at their physical or digital location). The mathematical content itself does not constitute an observable phenomenon.

The name DAG-OR — Dimensional Address Grammar for Observable Reality — encodes the scope boundary in the system's own name. An address system for observable reality that pretends to also address the unobservable is not more comprehensive. It is less honest.

31 · The Epistemological Foundation (ATK)

The following is an accidental discovery in the course of developing Modulign's technical foundations, not a motivation for any design decision. It is documented here because it forms the philosophical basis for the Decision Protocol's architecture and its claim to produce knowledge-grade classifications.

31.1 The Structural Diagnosis

The Gettier problem (1963) demonstrates that justified true belief (JTB) is insufficient for knowledge: justification is a property of the subject's mental or inferential states, truth is a property of the world, and these two properties can coincide accidentally. Zagzebski (1994) establishes that no analysis of the form K = df true belief + X can escape Gettier cases given fallibilism, because any external bridge between justification and truth can always be satisfied accidentally. The Modulign Decision Protocol dissolves this problem architecturally: the Protocol is constitutively world-engaged at every step, eliminating the residual independence between justification and truth.

31.2 The ATNA Principle

Address-Theoretic Non-Accidentality Principle (ATNA):

A Modulign classification C of observation O is non-accidentally true if and only if:

(a) C was produced by the full Decision Protocol applied to the observable features of O;

(b) each step's justificatory basis traces to the observable features causally produced by T(C), the state of affairs making C true; and

(c) the Protocol contains no inference step epistemically isolated from O's observable features.

Under ATNA, there is no residual independence of J(C,O) from T(C). There is no gap into which Gettier luck can insert itself.

31.3 The ATK Formulation

Address-Theoretic Knowledge (ATK):

S knows that P if and only if:

(i) P is true;

(ii) S believes that P; and

(iii) S's belief that P is the output of a procedure that is:

(a) constitutively world-engaged — justificatory basis of each step traces to observable features causally produced by T(P);

(b) transparent — steps explicit and auditable;

(c) intersubjective — reproducible by any competent observer with access to the same observable features;

(d) exhaustive — covering all segments of the reality-space relevant to P; and
(e) scale-sensitive — operating at the scale at which T(P) is constituted.

31.4 The Derivation Step

ATK governs the classification act — assigning an MGN code to an observation. The derivation step is the further epistemic act of inferring a propositional belief from a classified observation. Example: the gravitational lensing observation in Section 28 is classified under ATK. The inference from that observation to the claim "dark matter is present in region X" is the derivation step — a separate epistemic act governed by scientific inference principles. ATK provides the best possible observational foundation for that inference: a permanent, verified, scale-annotated, expert-classified record with a full reasoning trail. A false derivation step is a logical error, not a Gettier gap.

33 · Versioning and Governance

Modulign versions follow MAJOR.MINOR notation. MAJOR increments indicate breaking changes to segment syntax, separator grammar, or core registry structure. MINOR increments indicate non-breaking expansions: new registry entries, new suffix tokens, editorial clarifications. All v1.0 numeric codes and all v2.0 mnemonic codes remain valid under v3.0 via the canonical lookup table. The v3.0 extensions are additive and do not break any existing code.

The canonical Modulign registry is maintained by Vincent Gonzalez and published as a public open-access document. Community contributions are accepted via the canonical repository. Submissions are reviewed against this specification before inclusion. Minor additions follow a quarterly release cycle. Breaking changes require a public comment period of no less than 90 days before adoption.

34 · Applications Across Disciplines

Modulign is infrastructure. Its value compounds as it is adopted across more domains. The same grammar serves:

- Live media and broadcasting — every feed in a global live-stream atlas has a Modulign address, enabling navigation by domain, location, scale, activity state, and temporal context simultaneously.
- Legal evidence and forensics — the ^EVID flag, append-only ledger, and full reasoning record provide a formal procedure for generating knowledge-grade evidence with auditable chain of custody.
- Environmental and scientific monitoring — sensor networks from seismic arrays to ocean buoys to telescope feeds share one unified addressing scheme queryable across all of them.
- Urban planning and smart cities — city infrastructure managers reference specific installations by Modulign codes rather than proprietary asset tags, providing interoperable references.
- AI training data provenance — every sample in an AI training set that incorporates observational data can carry a Modulign address encoding where it came from, when, at what scale, classified by whom.
- Journalism and verification — a journalist can apply a Modulign code to observed footage and check it against the public registry. Geographic consistency, scale appropriateness, and classification history are all immediately auditable.
- Insurance and risk assessment — real-time Continuum state across Modulign-classified observation nodes provides structured input for actuarial and risk models.
- Academic citation — every observational claim in a scientific paper that references a physical event can cite a permanent, resolvable Modulign address rather than a prose description.

Colophon

M O D U L I G N ™

A Dimensional Address Grammar for Observable Reality

D A G - O R · V E R S I O N 3 . 0

Authored by Vincent Gonzalez · Independent Scholar · VinceGonzalez@me.com

The world is live.
Now it has an address.
And now we know what it means to know that address.