PROCESS GUIDE

ODDC Certification Guide

Complete Process Guide

Version v5.0 · February 2026 · PUBLIC DOCUMENT

ODDC Certification Guide

Complete Process Guide

Version 5.0 — February 2026 — Confidential

ODDC (Operational Design Domain Conformance\

operate within formally declared boundaries with non-bypassable enforcement. This document is the complete guide to

obtaining ODDC certification — from initial inquiry through continued monitoring. No proprietary data required. The Interlock

observes your system in normal operation, auto-discovers operational boundaries, then enforces them across 72 cumulative

hours of active operation. Your IP stays yours — we certify the process, not the parameters.

Field

Details

Document

ODDC Certification Guide v5.0

Classification

Confidential — Applicant Distribution

Effective Date

February 2026

Specification

ODDC v1.0 — Effective January 2026

Owner

Sentinel Authority — Conformance Operations

Contact

conformance@sentinelauthority.org

Independent conformance determination. Sentinel Authority is not a regulator. This document does not constitute legal advice. ODDC

does not attest safety, compliance, cybersecurity, or performance.

ODDC Certification Guide · v5.0

SENTINEL AUTHORITY — ODDC Conformance

1. Introduction

1.1 Purpose

ODDC certification is an independent determination that an autonomous system has verifiable, enforceable runtime

boundary controls. The certification is built on three pillars: the ENVELO Interlock auto-discovers operational boundaries

from live telemetry (or the applicant specifies them\

enforcement model; and the CAT-72 test generates a cryptographic, tamper-evident record proving 72 cumulative hours of

in-bounds operation across active operational intervals.

IP Protection:

No proprietary data is required. Your ODD specifications, model weights, source code, and decision logic

are never shared with Sentinel Authority. We certify the process, not the parameters.

1.2 Framework Components

Component

Description

ODD

Operational Design Domain — Formal specification of operational boundaries, including

quantitative tolerances and constraints.

ENVELO

Enforced Non-Violable Execution-Limit Override — Runtime enforcement ensuring the system

cannot operate outside declared ODD boundaries.

CAT-72

Conformance Authorization Test — 72 cumulative hours of active operation demonstrating

bounded operation and enforcement effectiveness. Clock counts only during active operation; pauses when system is idle or powered down.

1.3 Certification Paths

Path

How ODD Is Established

Best For

Adaptive

(default\

Interlock auto-discovers boundaries from operational telemetry during OBSERVE phase. Operator reviews and approves.

Systems where operators prefer not to share proprietary ODD specifications

Prescriptive

Applicant submits a complete ODD specification with quantitative boundaries.

Systems with well-documented, pre-existing ODD specifications

1.4 What ODDC Is Not

ODDC explicitly does not constitute:

· Regulatory approval or certification

· Safety certification (e.g., IEC 61508, ISO 26262\

· Product certification or quality mark

· Guarantee of system performance or reliability

· Insurance or warranty of any kind

ODDC Certification Guide · v5.0

SENTINEL AUTHORITY — ODDC Conformance

2. Attestation Scope

2.1 What ODDC Attests

Upon successful conformance determination, ODDC attests that at the time of determination:

Category

Attestation

ODD Specification

Applicant has formally specified an Operational Design Domain with quantitative

boundaries, tolerances, and identified constraints.

Operational Evidence

System demonstrated stable operation within declared ODD through 72 cumulative

hours of CAT-72 testing across active operational intervals.

ENVELO Enforcement

Non-bypassable enforcement mechanism is architecturally present and activates

correctly on boundary approach.

Audit Trail

Tamper-evident audit records generated for all enforcement events with

cryptographic integrity. The audit chain is uninterrupted across all active operational

intervals.

2.2 What ODDC Does Not Attest

· Functional safety of underlying system design

· Regulatory or legal compliance

· Cybersecurity posture or resilience

· System performance, accuracy, or fitness for purpose

· AI model correctness, training data quality, or algorithmic fairness

ODDC Certification Guide · v5.0

SENTINEL AUTHORITY — ODDC Conformance

3. Conformance Process

The conformance process follows seven phases:

Phase

Duration

Owner

Key Deliverable

1. Inquiry & Eligibility

1\2262 weeks

Applicant

System overview, eligibility

confirmation

2. Formal Application

1 week

Application, tolerances, signed

agreement

3. ODD Specification Review

5\22610 days

Sentinel

ODD acceptance or revision

requests

4. ENVELO Deployment +

Boundary Review

< 1 hour + 1\2262

days

Applicant +

Interlock active, boundaries

admin-approved, portal green

5. CAT-72 Execution

72 cumulative

hours min

Automated

72-hour evidentiary telemetry

record

6. Determination & Attestation

Certificate, report, registry entry

7. Continued Monitoring

Ongoing

Both

Annual review, continuous

enforcement

3.1 Phase 1: Inquiry & Eligibility

Initial contact with Sentinel Authority to determine whether your autonomous system is a candidate for ODDC certification.

· System makes autonomous decisions that affect physical or operational outcomes

· System has a definable Operational Design Domain with measurable boundary parameters

· System has sensors, APIs, or telemetry endpoints for each ODD parameter

· Applicant has authority to deploy an enforcement interlock into the runtime environment

Outcome: Eligibility confirmed. Applicant proceeds to formal application.

3.2 Phase 2: Formal Application

Deliverable

Format

Notes

ODDC Application Form

Portal submission

System identity, version, architecture overview

ODD Specification

Template or adaptive

Quantitative boundaries — or let the Interlock discover

them

Tolerance Specification

Template (provided\

Acceptable deviation ranges per parameter

System architecture

diagram

PDF or image

Model inputs, outputs, decision paths, actuator

connections

Signed Conformance

Agreement

Digital signature

Terms, fees ($15,000 base\

Note: Tolerance specifications are locked at submission and cannot be amended during testing.

ODDC Certification Guide · v5.0

SENTINEL AUTHORITY — ODDC Conformance

Outcome: Accepted application with assigned Case ID (ODDC-YYYY-NNNNN\

3.3 Phase 3: ODD Specification Review

Sentinel conducts an independent review of the Operational Design Domain — whether auto-discovered by the Interlock or

submitted by the applicant — to verify it is complete, internally consistent, measurable, and enforceable.

· Each ODD parameter for measurability and precision

· Tolerance specifications for internal consistency

· All boundaries can be monitored by the ENVELO Interlock at runtime

· Three-tier enforcement thresholds are properly calibrated

Outcome: Accepted ODD specification. This becomes the binding reference document. No changes after acceptance.

ODDC Certification Guide · v5.0

SENTINEL AUTHORITY — ODDC Conformance

3.4 Phase 4: ENVELO Interlock Deployment

The ENVELO Interlock is deployed into the system's runtime environment — outbound-only, non-bypassable. In adaptive

mode, the Interlock enters OBSERVE phase, learning operational boundaries from live telemetry before enforcement

begins.

3.4.1 Security Architecture

Guarantee

Detail

Zero Listening Ports

Interlock opens no inbound ports. Only outbound HTTPS to api.sentinelauthority.org.

Customer Controlled

Applicant deploys, configures, and terminates. Sentinel cannot start, stop, or modify

remotely.

TLS 1.3 + Pinning

All communications encrypted with certificate pinning. Data encrypted at rest.

Your ODD Stays

Yours

Source code, model weights, and decision logic are never accessed. Only operational

telemetry is transmitted.

No PHI/PII

No personally identifiable information transmitted. HIPAA/BAA compatible.

3.4.2 System Requirements

Requirement

Specification

Operating System

Linux (Ubuntu 20.04+, RHEL 8+, Debian 11+\

Python

3.7 or higher

CPU / RAM

2 cores minimum / 512 MB minimum for ENVELO Interlock

Disk

1 GB for Interlock + logs; 10 GB recommended for CAT-72 retention

Network

Outbound HTTPS (port 443\

Clock

NTP-synchronized; accurate to +/

1 second

3.4.3 Installation

curl -sSL https://get.sentinelauthority.org | bash

The installer prompts for your Certificate ID and API Key (visible in the portal\

credentials, scans for telemetry sources, matches sources to ODD parameters, and installs the ENVELO CLI.

Validate:

envelo validate

Start daemon:

envelo start -d

Check status:

envelo status

3.4.4 Admin Boundary Review (Adaptive Path\

After OBSERVE phase completes, Sentinel's Conformance Engineer reviews auto-detected boundaries before CAT-72

Step

Owner

Description

1. OBSERVE complete

Interlock

Boundaries auto-detected and submitted to Sentinel portal.

ODDC Certification Guide · v5.0

SENTINEL AUTHORITY — ODDC Conformance

Step

Owner

Description

2. Admin review

Sentinel

Conformance Engineer reviews boundaries. Typically 1\2262

business days.

3. Boundary approval

Admin approves. System transitions from OBSERVE to

BOUNDED.

4. CAT-72 authorized

Admin authorizes test. Portal activates "Begin Test" button.

5. Test starts

Applicant

Operator initiates CAT-72. Cumulative 72-hour clock begins.

Note: CAT-72 cannot begin until admin has reviewed and approved the auto-detected boundaries.

Outcome: Interlock active, boundaries admin-approved, portal green. Ready for CAT-72.

ODDC Certification Guide · v5.0

SENTINEL AUTHORITY — ODDC Conformance

3.5 Phase 5: CAT-72 Execution

The Conformance Authorization Test (CAT-72\

operation across active operational intervals. The CAT-72 clock measures 72 cumulative hours of active operation — it

pauses when the system is idle, powered down, parked, or between operational shifts.

Note: "Uninterrupted" in the CAT-72 specification refers to the audit chain and cryptographic record — the record must not gap during

active operation. It does not mean the system must operate non-stop.

Phase

Description

Cumulative Enforcement

Demo

72 cumulative hours of active operation across intervals. Clock pauses during

idle/off periods.

Boundary Stress Testing

Stress testing across limits. ENVELO decelerates to Minimum Risk Condition

before the wall.

Enforcement Proof

Verified tiered response: self-correction (Tier 1\

Tier 2\

ENVELO Wall (Tier 3\

3.5.1 Pass/Fail Criteria

· Zero Tier 3 (ENVELO Wall\

· Tier 2 violations must trigger successful MRC within specified time

· Uninterrupted audit chain — no gaps in the cryptographic telemetry record during active operation

· All parameters must report data across all active operational intervals

Outcome: 72 cumulative hours of evidentiary telemetry record, cryptographically sealed.

3.6 Phase 6: Determination & Attestation

Sentinel's Conformance Engineers independently analyze the CAT-72 evidentiary record against the accepted ODD

specification.

· ODDC Certificate with unique certificate number (ODDC-YYYY-NNNNN\

· Conformance Assessment Report detailing all findings

· Public registry entry at registry.sentinelauthority.org

· Digital badge and certificate assets for marketing use

Outcome: ODDC certificate issued. System enters CONFORMANT state. Listed in public Conformance Registry.

3.7 Phase 7: Continued Monitoring

ODDC certification is not a point-in-time assessment. The ENVELO Interlock continues operating after certification.

· ENVELO Interlock must remain active and reporting

· Annual conformance review ($12,000/year\

· Changes to system architecture, ODD parameters, or firmware require re-assessment

Certificate may be suspended or revoked if the Interlock is disabled, material violations are detected, the annual review fee

is not paid, or material system changes are made without re-assessment.

Outcome: Continuous conformance enforcement. Certificate active as long as Interlock runs and annual reviews are

completed.

ODDC Certification Guide · v5.0

SENTINEL AUTHORITY — ODDC Conformance

4. Five Conformance Gates

Gate

Requirement

Description

ODD

Auto-Discovered

Operational boundaries discovered from live telemetry, or

specified by applicant

STABLE

Enforcement Verified

72 cumulative hours of enforced operation within

discovered/specified bounds

ENVELO

Enforcement Active

Non-bypassable runtime enforcement at all times

AUDIT

Tamper-Evident

Cryptographic records of every enforcement check;

uninterrupted audit chain during active operation

REVOKE

Drift Protocol

Clear suspension path when boundaries are exceeded

4.1 Conformance States

State

Meaning

OBSERVE

Interlock deployed, learning operational boundaries from telemetry. No enforcement yet.

BOUNDED

Boundaries established and enforcement active. CAT-72 in progress or pending.

CONFORMANT

Full conformance. Certificate active. Continuous enforcement and monitoring.

PAUSED

Under review. Boundary exceedance detected or material system change.

ODDC Certification Guide · v5.0

SENTINEL AUTHORITY — ODDC Conformance

5. Three-Tier Enforcement Model

ENVELO enforces boundaries using a three-tier model. Approach triggers self-correction. Breach forces Minimum Risk

Condition. Wall contact halts execution.

Tier

Name

Trigger

Action

Advisory

(Self-Correction\

Approaching ODD boundary

(within tolerance\

System self-corrects. Log warning,

notify dashboard.

ODD Breach (MRC\

Parameter exceeds ODD

boundary

Trigger Minimum Risk Condition.

Decelerate to safe state within

specified time.

ENVELO Wall (Hard

Halt\

Parameter exceeds hard limit

Immediate actuation block.

Non-bypassable, non-configurable,

instant.

Note: Tier 3 violations during CAT-72 result in automatic test failure.

ODDC Certification Guide · v5.0

SENTINEL AUTHORITY — ODDC Conformance

6. Fee Schedule

Fee

Amount

When

Conformance Assessment

$15,000

Due at application — covers ODD review, CAT-72 execution,

certificate issuance. Non-refundable.

Annual Maintenance

$12,000/year

Begins at certificate issuance — continuous monitoring,

registry maintenance, annual review.

Enterprise

Custom

Volume pricing, dedicated support — contact

conformance@sentinelauthority.org

All fees USD. Base rates. Non-refundable. Request a quote at conformance@sentinelauthority.org.

ODDC Certification Guide · v5.0

SENTINEL AUTHORITY — ODDC Conformance

7. Boundary Specification Format

Boundaries are stored in Sentinel Authority's database and fetched by the ENVELO Interlock at startup. In adaptive mode,

boundaries are auto-discovered from operational telemetry and stored after operator approval.

Field

Type

Description

name

string

Human-readable parameter name

parameter

System identifier for the parameter

min_value / max_value

number

ODD bounds (inclusive\

hard_limit

ENVELO Wall threshold (Tier 3\

unit

Unit of measurement

tolerance

Acceptable measurement tolerance (+/

· Geographic: Circle (center + radius\

ordered vertices\

min/max meters\

· Temporal: Allowed operating hours, allowed days of week, timezone

· State: Allowed values list, forbidden values list

ODDC Certification Guide · v5.0

SENTINEL AUTHORITY — ODDC Conformance

8. ENVELO CLI Reference

The ENVELO CLI is the single interface for all Interlock operations. Installed automatically by the one-command installer.

8.1 Running

Command

Description

envelo start [-d]

Start enforcement (foreground or daemon\

envelo stop

Stop running Interlock

envelo restart

Stop and restart

envelo validate

Pre-flight configuration check

8.2 Monitoring

envelo status

Full health check (Interlock, API, TLS, sources\

envelo monitor

Live terminal dashboard

envelo events

Violation and enforcement history

envelo logs [-f]

View or follow Interlock logs

envelo cat72

CAT-72 cumulative test status and progress

8.3 Boundaries & Sources

envelo boundaries

Show all enforced boundary definitions

envelo resync

Force re-fetch boundaries from Sentinel Authority

envelo simulate

Dry-run a boundary check (shows tier result\

envelo test

Test all telemetry source connections

envelo rediscover [--all]

Re-scan environment for telemetry sources

8.4 Infrastructure

envelo service install

Auto-start on boot (systemd / launchd\

envelo docker

Generate Docker deployment files

envelo k8s

Generate Kubernetes deployment files

ODDC Certification Guide · v5.0

SENTINEL AUTHORITY — ODDC Conformance

Command

Description

envelo diagnose

Generate support bundle (redacted, safe to send\

envelo export

Auditor-ready boundary and config bundle

envelo update

Self-update

envelo rollback

Uninstall ENVELO (suspends conformance\

ODDC Certification Guide · v5.0

SENTINEL AUTHORITY — ODDC Conformance

9. Related Documents

Document

Version

Description

ENVELO Requirements

v3.0

Runtime enforcement requirements specification

CAT-72 Procedure

v4.0

Conformance Authorization Test requirements and format

ODDC Overview

Framework overview for regulators and evaluators

ODDC Scenarios

Sector-specific implementation guidance

Conformance Agreement

Current

Terms and conditions for conformance determination

— End of Document —

This document is published by Sentinel Authority for use by ODDC applicants and their engineering teams. Distribution permitted with

attribution. \251 2026 Sentinel Authority.

ODDC Certification Guide · v5.0

SENTINEL AUTHORITY — ODDC Conformance