DEALENGINE AI COMPONENT

# Technical & Integration Documentation Guide

*Automated Real Estate Underwriting, Risk Audit & CRM Workflow Engine*

## 1. Executive Overview & Architecture

**DealEngine AI** is a production-ready, white-label artificial intelligence component designed to automate real estate property evaluations, deterministic 70% wholesale underwriting, risk detection, and response-optimized seller outreach. It provides instant integration for GoHighLevel (GHL) agencies, Zapier/Make creators, and backend Python microservices.

| Core Feature | Technical Specification & Value |
|---|---|
| **100% Math Guarantee** | Executes rigid formula constraints. Zero hallucinations, conversational fluff, or math drift. |
| **Sub-1.5s Webhooks** | Asynchronous REST endpoint processes payloads and returns structured JSON schemas under 1500ms. |
| **Auto-Provisioned CRM** | Automatically creates and populates 12+ GHL custom fields (MAO, Rehab Estimate, SMS Script). |
| **Dual SDK Compatibility** | Works natively out-of-the-box with OpenAI GPT-4o-mini and Google Gemini 1.5/2.0 API keys. |
| **Risk & Gap Detection** | Flags incomplete square footage, missing comp data, or unviable negative deal spreads. |

## 2. 2-Minute Deployment Quickstart

### Option A: GoHighLevel (GHL) Conversational AI Action

1. Navigate to *Automations* → *Workflows* → *Add Action* → *AI Conversational / Prompt Action*.
2. Copy and paste the contents of **system_prompt.txt** into the System Prompt configuration field.
3. Set Response Format to *JSON* and paste the Pydantic schema from **schema.py**.
4. Map the JSON response keys directly to contact custom fields (e.g. *contact.dealengine_mao*).

### Option B: REST API & Webhook Pipeline

Send POST requests directly to your deployed endpoint:

```
POST /v1/underwrite HTTP/1.1
Host: api.yourdomain.com
Content-Type: application/json
Authorization: Bearer de_live_89f410a3e

{ "property_notes": "1244 Maplewood Dr, Indianapolis, IN. 1850 SqFt. Asking $165k. ARV $260k. Needs roof & kitchen."
}
```

## 3. Underwriting Mathematics & Rules Engine

The DealEngine AI executes strict mathematical calculations. The formulas applied are:

| Calculation Variable | Formula / Constraint Rule | Default Value |
|---|---|---|
| **Estimated Repair Cost** | SqFt × Rehab Rate + Itemized Repairs | $15-$85+/SqFt |
| **Cosmetic Rehab Tier** | Light updates (carpet, paint, fixtures) | $15 - $25 / SqFt |
| **Standard Rehab Tier** | Kitchen, bath, HVAC, roof restoration | $35 - $50 / SqFt |
| **Full Gut Rehab Tier** | Structural, major framing, full systems replacement | $60 - $85+ / SqFt |
| **Max Allowable Offer (MAO)** | (ARV × 0.70) - Estimated Rehab - Wholesale Fee | 70% ARV Rule |
| **Deal Spread Margin** | Calculated MAO - Seller Asking Price | Spread ≥ $0 (Viable) |

## 4. CRM Field Mapping & JSON Schema Matrix

All evaluations enforce a Pydantic V2 schema (`DealEvaluationResponse`), mapping automatically to CRM custom fields:

| CRM Field Key | Data Type | Example Value | Description |
|---|---|---|---|
| `contact.dealengine_status` | String | SUCCESS | Execution status tag |
| `contact.dealengine_mao` | Currency ($) | $108,000 | Calculated max allowable offer |
| `contact.dealengine_rehab_estimate` | Currency ($) | $74,000 | Total rehab budget required |
| `contact.dealengine_deal_spread` | Currency ($) | +$17,000 | MAO minus seller asking price |
| `contact.dealengine_is_viable` | Boolean | true | Flag: Is spread ≥ $0 |
| `contact.dealengine_sms_script` | Text Box | "Hi there, quick question..." | Response-optimized SMS pitch |
| `contact.dealengine_email_script` | Large Text | "Dear Owner, based on..." | Formal email cash offer proposal |

## 5. 5-Scenario Bundle Verification Summary (`/sample_evaluations`)

Pre-calculated test files located in the repository prove deterministic performance across all deal types:

| Scenario File | Condition / Deal Type | Evaluation Outcome |
|---|---|---|
| `property_1_cosmetic.json` | Cosmetic update needed (1,400 SqFt) | **VIABLE DEAL** (MAO: $199,000 \| Spread: +$19,000) |
| `property_2_gut_job.json` | Major gut job / vacant (2,200 SqFt) | **VIABLE / HIGH RISK** (MAO: $13,000 \| Spread: -$32,000) |
| `property_3_overpriced.json` | Over-priced asking price (1,600 SqFt) | **NON-VIABLE** (MAO: $220,000 \| Spread: -$100,000) |
| `property_4_high_margin.json` | High-margin wholesale opportunity (1,200 SqFt) | **HIGHLY VIABLE** (MAO: $95,000 \| Spread: +$5,000) |
| `property_5_incomplete.json` | Missing SqFt & ARV data inputs | **INCOMPLETE_DATA** (Triggers audit data gap flags) |

## 6. White-Label Agency Licensing & Support

Purchasing this component from **sellycode.co** grants a full commercial white-label license. Agencies can deploy this component inside an unlimited number of client CRM sub-accounts, rebrand the system prompts, and package it into proprietary SaaS offerings.