

ResidenceAssociationERC1155 Smart Contract

Facilities Management & Tenant
Access System

Contract Purpose

- - ERC1155-based registry for tenants and facility access
- - Tokenized tenant membership
- - Centralized management of facility privileges
- - Provides access control, activation status, timestamps

Core Data Structures

- • FacilityType enum (SwimmingPool, Gym, Billiards, Golf, Tennis)
- • Tenant struct:
 - - name, apartmentNumber, active, metadataURI
- • FacilityAccess struct:
 - - active, startTime, endTime, months

Storage Layout

- • nextTenantId: incremental ID counter
- • tenants[tenantId] → Tenant
- • tenantFacilities[tenantId][facility] → FacilityAccess
- • tenantAddresses[] → list of all tenants
- • tenantIds[address] → tenantId

Events

- • TenantRegistered(tenantId, tenantAddress, name, apartment)
- • TenantUpdated(tenantId, name, apartment, active)
- • FacilityGranted(tenantId, facility, months, endTime)
- • FacilityRevoked(tenantId, facility)

Tenant Management

- • registerTenant():
 - - Creates tenant profile
 - - Mints ERC1155 membership token
- • updateTenant():
 - - Updates tenant status, metadata, and details

Facility Management

- • grantFacility():
 - - Assigns access to facility for a given duration
 - - Tracks time window and months
- • revokeFacility():
 - - Disables an existing facility privilege
- • checkFacilityStatus():
 - - Returns current access state and expiration

Access Control

- • onlyOwner restricted methods:
 - - registerTenant()
 - - updateTenant()
 - - grantFacility()
 - - revokeFacility()
- • Public View Functions:
 - - getTenant()
 - - getAllTenants()

Smart Contract Summary

- - A tenant-focused facility access registry
- - Uses ERC1155 tokens as membership identifiers
- - Tracks granular access by time periods
- - Fully owner-managed permission system
- - Scalable add-on for gated communities, apartments, clubs