

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