# TURNSTILE REQUIREMENTS

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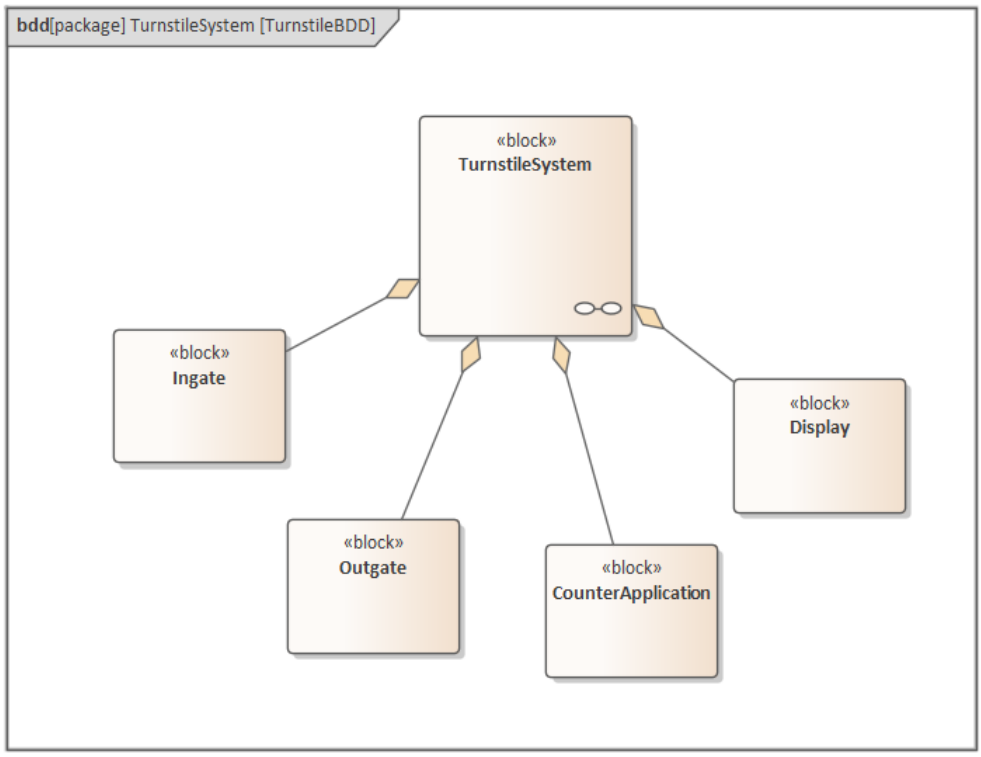
**Revision History**

| REQ ID | REQ TYPE | REVISION DATE | RELEASE DATE | DESCRIPTION |
|---|---|---|---|---|
| 1: HLR-1 | High-level | 10/23/2021 | | |
| 2: HLR-2 | High-level | 10/23/2021 | | |
| 3: HLR-3 | High-level | 11/26/2021 | | |
| 4: IN-LLR-2 | Low-level | 11/08/2021 | | |
| 5: IN-LLR-3 | Low-level | 11/08/2021 | | |
| 6: OUT-LLR-2 | Low-level | 11/26/2021 | | |

## 1. INTRODUCTION

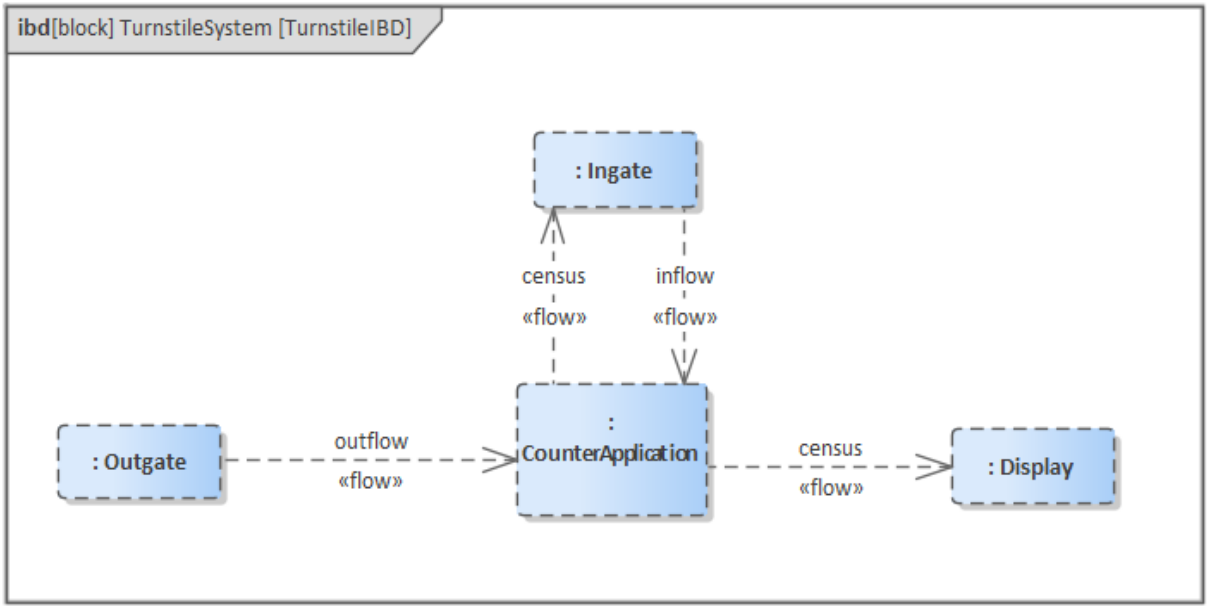
The Turnstile example is similar to something you may see at a park security gate. It consists of an In Gate, an Out Gate, a Counter Application, and a Display.




This block definition diagram shows the basic components of the Turnstile System:

- Ingate is the physical gate that is used to meter the flow of people into the venue

- Outgate is the physical gate that counts the flow of people leaving the venue
- CounterApplication is the software that manages the running census
- Display is a simple display to show the count of people in the venue




The Turnstile Example provides various example requirements. System Level, High-level Software and Low-Level Software requirements are all represented in the example. In addition, Data Dictionary Terms are included to provide relationships between requirements at a given level. Examples of tracing to higher level requirement are included. Development activities are identified along with the Agents that performed the activities.

## 2. SYSTEM REQUIREMENTS

1) Requirement identification: Sys-1
    a. Description: Turnstile system shall track the number of people that travel through the in gate.
    b. Governs: Turnstile
2) Requirement identification: Sys-2
    a. Description: Turnstile system shall track the number of people that travel through the out gate.
    b. Governs: Turnstile
3) Requirement identification: Sys-3
    a. Description: Turnstile system shall track the number of people that are currently in the park.
    b. Governs: Turnstile

## 3. HIGH LEVEL REQUIREMENTS

1) Requirement identification: HLR-1
    a. Description: The Computer shall increment the counter when an inflow event is received, and the counter is less than max int.
    b. Satisfies : Sys-1
    c. Mitigates: H-1.2
    d. Governs : CounterApplication
    e. Created by : HlrDev2
2) Requirement identification: HLR-2
    a. Description: The Computer shall decrement the counter when an outflow event is received, and the counter is greater than 0.
    b. Satisfies: Sys-2
    c. Mitigates :H-1.1
    d. Governs : CounterApplication
    e. Created by : HlrDev2
3) Requirement identification: HLR-3
    a. Description: The Computer shall publish the counter at a 1 htz rate.
    b. Satisfies: Sys-3
    c. Governs : CounterApplication
    d. Created by : HlrDev1

## 4. LOW LEVEL REQUIREMENTS

1) Requirement identification: EXE-LLR-1
    a. Description: Executive shall spawn Input Thread on powerup.
    b. Governs: ExecutiveThread
    c. Created by: LlrDev1
2) Requirement identification: EXE-LLR-2
    a. Description: Executive shall spawn Output Thread on powerup.
    b. Governs: ExecutiveThread
    c. Created by: LlrDev1
3) Requirement identification: EXE-LLR-3
    a. Description: Executive shall print a single '.' character to the console every second when running.
    b. Governs: ExecutiveThread
    c. Created by : LlrDev1
4) Requirement identification: IN-LLR-1
    a. Description : Input Thread shall initialize the park count to 0 on powerup.
    b. Governs: InputThread
    c. Created by: LlrDev1
5) Requirement identification: IN-LLR-2
    a. Description: Input Thread shall check for an incoming UDP message on port 62000.
    b. Created by : LlrDev1
    c. Governs : InputThread
    d. Satisfies: HLR-1:v2, HLR-2:v2

6) Requirement identification: IN-LLR-3
   a. Description : Input Thread shall add the delta value received by the UDP to the park count and send the updated park count to the Output Thread when a valid UDP message is received, and the park count range is not exceed.
   b. Governs: InputThread
   c. Satisfies: HLR-1:v2, HLR-2:v2
   d. Created by: LlrDev1
7) Requirement identification: IN-LLR-4
   a. Description : Input Thread shall limit park count to between 0 and 1500.
   b. Governs: InputThread
   c. Created by: LlrDev1
8) Requirement identification: IN-LLR-5
   a. Description : Input Thread shall print 'Invalid Message' to the console when a invalid UDP message is received.
   b. Governs: InputThread
   c. Created by: LlrDev1
9) Requirement identification: IN-LLR-6
   a. Description : Input Thread shall print 'Limit Exceeded" to the console when a valid UDP message is received, and the park count range is exceeded.
   b. Governs: InputThread
   c. Created by: LlrDev1
10) Requirement identification: OUT-LLR-1
   a. Description : Output Thread shall initialize the park count to 0 on powerup.
   b. Governs: OutputThread
   c. Created by: LlrDev1
11) Requirement identification: OUT-LLR-2
   a. Description : Output Thread shall broadcast a UDP message on port 62001 with the park count every second.
   b. Satisfies : HLR-3:v2
   c. Governs: OutputThread
   d. Created by: LlrDev1