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| Department: | Research & Development |

# Document Interface Specification

This document is generated by ComMA version 3.3.0.

# Versioning

|  |  |
| --- | --- |
| **Interface** | **Version** |

|  |  |
| --- | --- |
| IVendingMachine | 0.3 |

# Software Interface Design

## Syntax

### Data types and constants

#### Global User-Defined Types

**ENUMS**

|  |
| --- |
| **productName** |
| Enum with the available products |

|  |  |
| --- | --- |
| WATER |  |

|  |  |
| --- | --- |
| COLA |  |

|  |  |
| --- | --- |
| JUICE |  |

|  |
| --- |
|  |

|  |
| --- |
| **coinStatus** |
| When a coin is inserted in the vending machine it can be either rejected or accepted |

|  |  |
| --- | --- |
| ACCEPTED |  |

|  |  |
| --- | --- |
| NOT\_ACCEPTED |  |

|  |
| --- |
|  |

|  |
| --- |
| **result** |
| Type for the result of the operation for requesting a product |

|  |  |
| --- | --- |
| DELIVERED |  |

|  |  |
| --- | --- |
| NOT\_ENOUGH\_MONEY |  |

|  |  |
| --- | --- |
| NOT\_ENOUGH\_SUPPLIES |  |

|  |
| --- |
|  |

|  |
| --- |
| **switchOnResult** |
|  |

|  |  |
| --- | --- |
| SWITCH\_ON\_OK |  |

|  |  |
| --- | --- |
| LOAD\_PRODUCTS\_FIRST |  |

|  |
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**RECORD TYPES**

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| --- |
| **Product** |
| Type for information about the products that can be ordered from the vending machine |

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| --- | --- | --- |
| enum productName | name | the name of the product |

|  |  |  |
| --- | --- | --- |
| int | cost | the price of the product |

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### Signature

#### Interface IVendingMachine

COMMANDS

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| --- | --- |
| void **loadProducts**(in int colaSupplies, in int juiceSupplies, in int waterSupplies) | |
| Description | Loads bottles of cola, juice and water into the machine. |

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| --- | --- |
| Parameter colaSupplies | the number of loaded bottles of cola |

|  |  |
| --- | --- |
| Parameter juiceSupplies | the number of loaded bottles of juice |

|  |  |
| --- | --- |
| Parameter waterSupplies | the number of loaded bottles of water |

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| --- |
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| --- | --- |
| enum coinStatus **coinThrowedIn**() | |
| Description | A coin is thrown in the machine |

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| --- | --- |
| Returns | indicates if the machine accepts or rejects the coin |

|  |
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|  |  |
| --- | --- |
| int **returnMoney**() | |
| Description | Command for returning the current credit. |

|  |  |
| --- | --- |
| Returns | the amount of returned money |

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| --- | --- |
| enum result **orderProduct**(in enum productName prodName) | |
| Description | Command for ordering a product |

|  |  |
| --- | --- |
| Parameter prodName | indicates the product name |

|  |  |
| --- | --- |
| Returns |  |

|  |
| --- |
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| --- | --- |
| enum switchOnResult **switchOn**() | |
| Description | Command for switching on the machine |

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| --- | --- |
| Returns | if the total number of bottles in the machine is more than 0 the result is SWITCH\_ON\_OK, otherwise the result is LOAD\_PRODUCTS\_FIRST |

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SIGNALS

|  |  |
| --- | --- |
| **switchOff**() | |
| Description | Non-blocking call for switching off the machine |

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|  |

EVENTS

|  |  |
| --- | --- |
| **zeroTotalSupplies**() | |
| Description | Indicates that the machine is out of products |

|  |
| --- |
|  |

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| --- | --- |
| **outOfOrder**() | |
| Description | Indicates that an internal error occurred |

|  |
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|  |

|  |  |
| --- | --- |
| **inventoryInfo**(int items) | |
| Description | Indicates the total number of bottles in the machine |

|  |  |
| --- | --- |
| Parameter items |  |

|  |
| --- |
|  |

## Semantics

### State behavior

#### Interface IVendingMachine

|  |  |  |
| --- | --- | --- |
| **Global Variables** | | |
| **Type** | **Name** | **Comment** |

|  |  |  |
| --- | --- | --- |
| int | credit |  |

|  |  |  |
| --- | --- | --- |
| int | colaSupply |  |

|  |  |  |
| --- | --- | --- |
| int | juiceSupply |  |

|  |  |  |
| --- | --- | --- |
| int | waterSupply |  |

|  |  |  |
| --- | --- | --- |
| **Variable Initializations** | | |
| **Variable** | **Value** | **Comment** |

|  |  |  |
| --- | --- | --- |
| credit | 0 |  |

|  |  |  |
| --- | --- | --- |
| colaSupply | 1 |  |

|  |  |  |
| --- | --- | --- |
| juiceSupply | 1 |  |

|  |  |  |
| --- | --- | --- |
| waterSupply | 2 |  |

STATE MACHINE vendingMachine

Transitions defined in every state :

|  |  |  |
| --- | --- | --- |
| **Event** | **Guard** | **Actions** |

|  |  |  |
| --- | --- | --- |
| - |  | inventoryInfo |

Transitions defined in every state except states Initial:

|  |  |  |
| --- | --- | --- |
| **Event** | **Guard** | **Actions** |

|  |  |  |
| --- | --- | --- |
| switchOff() |  | - |

|  |  |  |
| --- | --- | --- |
| returnMoney() |  | reply |

|  |  |  |  |
| --- | --- | --- | --- |
| **Initial State Initial** | | | |
| **Event** | **Guard** | **Target State** | **Actions** |

|  |  |  |  |
| --- | --- | --- | --- |
| switchOn() | (colaSupply + juiceSupply + waterSupply) > 0 | Operational | reply(switchOnResult::SWITCH\_ON\_OK) |

|  |  |  |  |
| --- | --- | --- | --- |
| loadProducts(int colaSupplies, int juiceSupplies, int waterSupplies) |  | Initial | reply |

|  |  |  |  |
| --- | --- | --- | --- |
| **State Operational** | | | |
| **Event** | **Guard** | **Target State** | **Actions** |

|  |  |  |  |
| --- | --- | --- | --- |
| coinThrowedIn() |  | Operational | reply(coinStatus::ACCEPTED) |

|  |  |  |  |
| --- | --- | --- | --- |
| coinThrowedIn() |  | Operational | reply(coinStatus::NOT\_ACCEPTED) |

|  |  |  |  |
| --- | --- | --- | --- |
| orderProduct(enum productName prodName) |  | Operational | reply(result::DELIVERED) reply(result::NOT\_ENOUGH\_MONEY) reply(result::NOT\_ENOUGH\_SUPPLIES) reply(result::DELIVERED) reply(result::NOT\_ENOUGH\_MONEY) reply(result::NOT\_ENOUGH\_SUPPLIES) reply(result::DELIVERED) reply(result::NOT\_ENOUGH\_MONEY) reply(result::NOT\_ENOUGH\_SUPPLIES) |

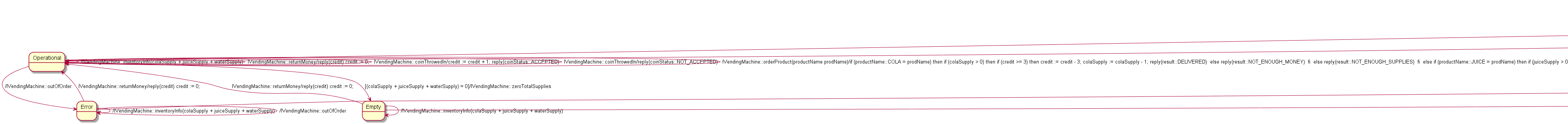
|  |  |  |  |
| --- | --- | --- | --- |
| - | (colaSupply + juiceSupply + waterSupply) = 0 | Empty | zeroTotalSupplies |

|  |  |  |  |
| --- | --- | --- | --- |
| - |  | Error | outOfOrder |

|  |  |  |  |
| --- | --- | --- | --- |
| **State Empty** | | | |
| **Event** | **Guard** | **Target State** | **Actions** |

|  |  |  |  |
| --- | --- | --- | --- |
| **State Error** | | | |
| **Event** | **Guard** | **Target State** | **Actions** |

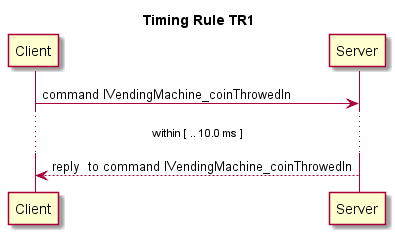
|  |  |  |  |
| --- | --- | --- | --- |
| - |  | Error | outOfOrder |



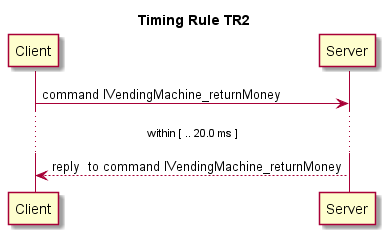
### Timing constraints

#### Interface IVendingMachine

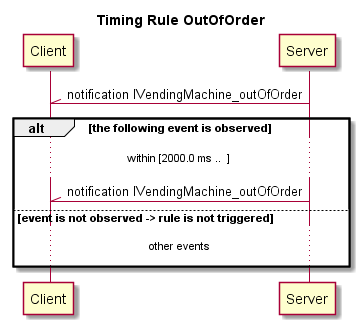
Constraint TR1



Constraint TR2



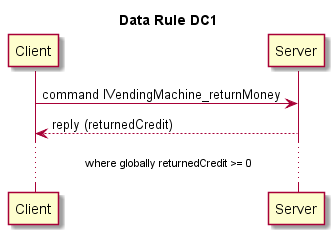
Constraint OutOfOrder



### Data constraints

#### Interface IVendingMachine

Constraint DC1



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# Control of the Form

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| Approver | (approval via electronic signature in document management tool) |
| GEN: Process Owner |
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# History of the Form

| Revision | Doc. Date | Author | CR-ID | Description |
| --- | --- | --- | --- | --- |
| 03 | 2017 Aug 22 | Rob Albers,  Benno Tonissen | 2017/112 | * Comply with new format * Added dedicated software interface design specification sections with guidance. |

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