

Simulated Railroad Framework, <http://simulrr.sourceforge.net>  
Synopsis: [000\\_Synopsis](#)

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The Carousel Drive  
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## 1 Synopsis

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The "Carousel Drive" is a MIDAS Object that is provided together with the SMUOS Framework as one of the so-called "basic MIDAS Objects". No SMUOS extension is necessary to support this MIDAS Object.

The "Carousel Drive" is implemented in the X3D prototype MoosDriveA within the file MoosDriveA.x3d.

## 2 Purpose of the Carousel Drive

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The "Carousel Drive" MIDAS Object helps to provide a synchronized position within a rotating animation that is calculated according to Newton's laws (considering mass and friction).

A Carousel Drive object MUST contain a "binary switch" object, that will be used to modify the characteristic curve of the carousel ("power on" and "power off").

## 3 External View

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The MIDAS Object "Carousel Drive" can be used in

- bound/intrinsic models in static modules
- bound/intrinsic models in dynamic modules
- unbound models (not yet tested)

Following fields are provided at the external interface uiObj:

### Standard Fields

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Please refer to chapter 5 of the paper [013\\_ModelsAndObjects](#) for a description of fields that must be supported by any MIDAS Object.

"initialState" (SFVec3f)

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This field is used to initialize the state of the carousel.

- initialState.x is interpreted as position in radians
- initialState.y is interpreted as angular velocity in rad / s
- initialState.z is interpreted as angular acceleration in rad /s^2

"inertia" (SFFloat), "friction" (SFFloat),

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"characM" (MFFloat), "characW" (MFFloat)

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These parameters define the dynamic model of the carousel. The parameters "characM" and "characW" must have the same dimension and define the points of the characteristic curve  $M_i(w)$ , i.e. inner momentum in dependency of the angular velocity.

The parameters "inertia" and "friction" are used in the formula to calculate the angular acceleration from the inner momentum and the current angular velocity:  $inertia.dw/dt = M = M_i(w) - friction.w$

"minimumJump" (SFFloat), "accelWeakness" (SFFloat),

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"maxDuration" (SFFloat), "minDuration"  
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The state of the carousel (a vector of position, velocity and acceleration) is calculated centrally in the server software. The server distributes so called "targets" every now and then. The target is a tuple of target position and duration, within which the target position shall be achieved. The duration, until the next targets will be distributed, may change over time. These parameters are used to calculate the targets duration.

#### 4 Internal View

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MoosDriveA uses MibAnim as a base.

#### 5 Additional Info

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none