Simulated Railroad Framework, http://simulrr.sourceforge.net Synopsis: 100 SrrFramework This file valid for step 0033.10.5 Issue Date: 2019-06-09 The Carousel Drive _____ 1 Synopsis _____ 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 XMobDriveA.x3d. 2 Purpose of the Carousel Drive ------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 _____ 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 _____ Please refer to chapter 5 of the paper <u>013 ModelsAndObjects</u> for a description of fields that must be supported by any MIDAS Object. "initialState" (SFVec3f) _____ 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), _____ "characM" (MFFloat), "characW" (MFFloat) _____ 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 Mi(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 = Mi(w) - friction.w

"minimumJump" (SFFloat), "accelWeakness" (SFFloat),
"maxDuration" (SFFloat), "minDuration"

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.

"dependentMobs" (MFnode)

The user MUST attach one "MoosSwitch" MIDAS Object here (e.g. MoosSwitchA). The "MoosSwitch" will be used to switch the carousel on/off.

"angle" (SFFloat) -----This field outputs the position of the carousel in radians (between 0 and 2 pi).

4 Internal View ------MoosDriveA uses MibAnim as a base.

5 Additional Info

none