



## Cab Control Blueprints

Release version 1.0 (2007-11-09)

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## 1 Input Mappers

Input Mappers define all the controls that it is possible to use in the locomotives. There is one Input Mapper for each Control Model; Expert, Intermediate and Simple

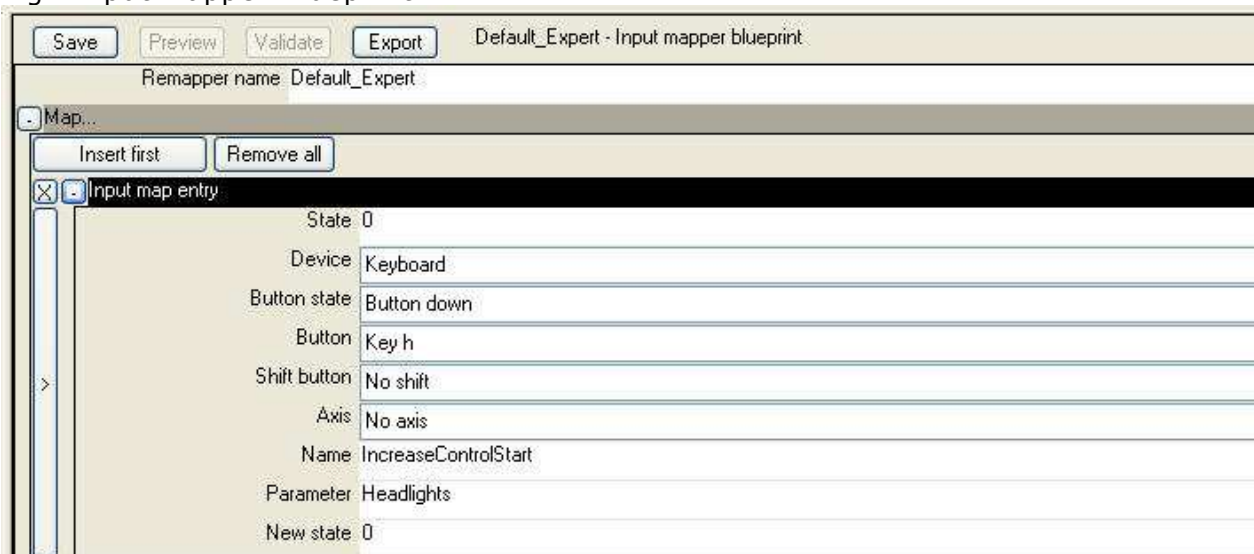
The Input Mappers Default\_Expert.xml, Default\_Intermediate.xml and Default\_StopGo.xml can be found in the following folder  
RailSimulatorCore\InputMappers

They can be edited and created using the Asset Editor

The controls must be defined in each Control Model Input Mapper that they are valid for. For example Wipers are used in all 3 Control Models, therefore must be present in Default\_Expert.xml, Default\_Intermediate.xml and Default\_StopGo.xml

### 1.1 Input Mapper Blueprints

Fig1 Input Mapper Blueprint



The screenshot shows the 'Default\_Expert - Input mapper blueprint' window. It includes buttons for 'Save', 'Preview', 'Validate', and 'Export'. Below these, the 'Remapper name' is set to 'Default\_Expert'. A 'Map...' button is visible, followed by 'Insert first' and 'Remove all' buttons. The main area is titled 'Input map entry' and contains a table with the following fields:

State	0
Device	Keyboard
Button state	Button down
Button	Key h
Shift button	No shift
Axis	No axis
Name	IncreaseControlStart
Parameter	Headlights
New state	0

#### 1.1.1 State <Undefined>

#### 1.1.2 Device

Select the device the Input Mapper is for. Currently only Keyboard is a valid option to choose, although the following is available for the future:

Keyboard / Mouse / Joystick0 / Joystick1 / Joystick2 / Joystick3

### 1.1.3 Button State

This defines when the control is activated

On press (Button Down) or on release (Button Up)

### 1.1.4 Button

This is the actual Key on the Keyboard, selectable from the list.

### 1.1.5 Shift Button

This is used to specify if the 'Ctrl' and 'Shift' keys are also desired. Options include: No Shift / Shift / Control / Shift Control

### 1.1.6 Axis

This defines if an axis is required for the control. As only keyboards are currently valid, No Axis is the only selectable option. However for future use the following options have been created:

Mouse X Axis / Mouse Y Axis / Mouse Wheel / Axis 0 – Axis 9/ No Axis

### 1.1.7 Name

IncreaseControlStart / Increase Control Stop / Decrease Control Start / Decrease Control Stop / ToggleControl

What you use here and how many entries you have in the Blueprint depends on how you want the keyboard to act with the control.

#### **Example 1**

For a simple toggle control such as 'V' for Wipers where you press 'V' once to turn the wipers on and press 'V' once again to turn them off, you would need one entry in the Blueprint

##### **Input Map Entry 1**

- Button Down
- Key\_V
- No Shift
- ToggleControl

#### **Example 2**

For a control such as 'X' for Sanders where you set the control anywhere between on and off with one key stroke, you need two entries in the Blueprint

##### **Input Map Entry 1**

- Button Down
- Key\_X
- No Shift
- Increase Control Start

##### **Input Map Entry 2**

- Button Up
- Key\_X
- No Shift
- Decrease Control Start

### Example 3

For a control such as 'H' for Headlights where you use <H> to increase the control and <Shift H> to decrease it, you need four entries in the Blueprint

#### **Input Map Entry 1**

- Button Down
- Key\_H
- No Shift
- Increase Control Start

#### **Input Map Entry 2**

- Button Up
- Key\_H
- No Shift
- Increase Control Stop

#### **Input Map Entry 3**

- Button Down
- Key\_H
- Shift
- Increase Control Start

#### **Input Map Entry 4**

- Button Up
- Key\_H
- Shift
- Increase Control Stop

### **1.1.8 Parameter**

This name is the link between the Input Mapper controls and the Cab Control of a Rail Vehicle. It must be the same as the Control Name field of the Control Value Blueprint located within the Engine Blueprint that you are creating the cab for. The names must match exactly and are case sensitive (in both blueprints they appear).

### **1.1.9 New State**

**<Undefined>**

## 2 Control Blueprint

The actual controls of a locomotive are specified within that vehicles' Engine Blueprint. They are located under the Control Container Component section, and get listed as 'Control Values' sets as seen below.

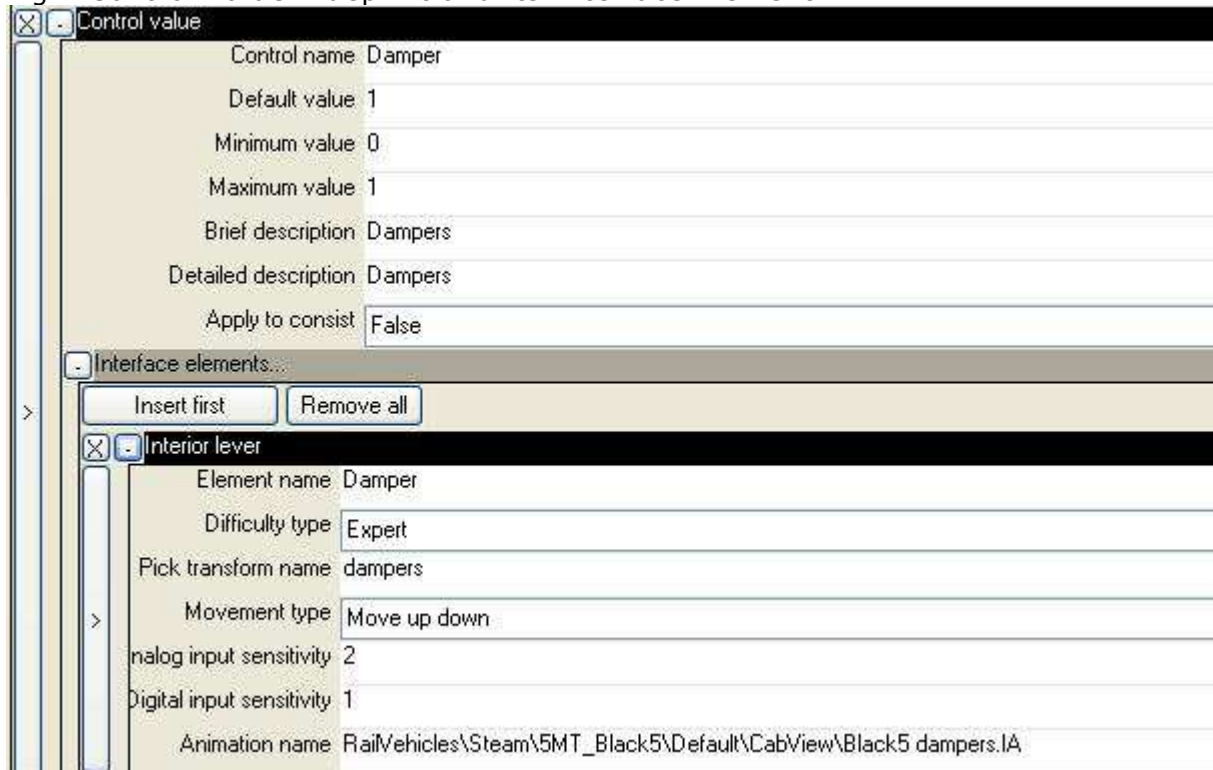
Fig 3 Engine Blueprint showing Control Values



Each Control Value, when expanded, shows the Control Value and one or more Interface Elements attached to it.

## 2.1 Control Value

Fig 2 Control Value Blueprint and its Interface Element



The screenshot displays the 'Control value' blueprint and its corresponding interface element. The 'Control value' section includes fields for 'Control name' (Damper), 'Default value' (1), 'Minimum value' (0), 'Maximum value' (1), 'Brief description' (Dampers), 'Detailed description' (Dampers), and 'Apply to consist' (False). Below this is the 'Interface elements' section, which contains buttons for 'Insert first' and 'Remove all'. The 'Interior lever' section shows fields for 'Element name' (Damper), 'Difficulty type' (Expert), 'Pick transform name' (dampers), 'Movement type' (Move up down), 'Analog input sensitivity' (2), 'Digital input sensitivity' (1), and 'Animation name' (RailVehicles\Steam\5MT\_Black5\Default\CabView\Black5 dampers.IA).

### 2.1.1 Control Name

This is the link to the Input Mapper Parameter field. For a control to be functional it needs to match exactly, including case, the Parameter (See 1.1.8) field in an Input Mapper Blueprint.

### 2.1.2 Default Value

This is the value that the control will be set to when the vehicle is loaded into the game. In the example shown above; the Damper controls on the Black 5 locomotive, 0 is off and 1 is on, the Default Value is 1, so the Dampers are 'On' when the loco is loaded into the game. It is possible to use intermediate values, for example if 0.5 was specified here, the Dampers would be 50% open when the loco is loaded.

### 2.1.3 Minimum Value

The control is allocated a numeric range over which the control value will change. This is the lowest value, the 'off' position. Numeric values other than 0 or 1 can be specified here

### 2.1.4 Maximum Value

The control is allocated a numeric range over which the control value will change. This is the highest value, the 'on' position. Numeric values other than 0 or 1 can be specified here

### 2.1.5 Brief Description

This field is used to input a short description of the control. This will then appear as the mouse over text used in the game.

### 2.1.6 Detailed Description

This field is used to input a longer description of the control. This is not used directly in the game, but can aid understanding the function when looking at this blueprint.

### 2.1.7 Apply to Consist

This setting determines if the Control Value can be passed down the train, from one vehicle to another as in the case of a Multiple Unit or Top & Tail arranged train.

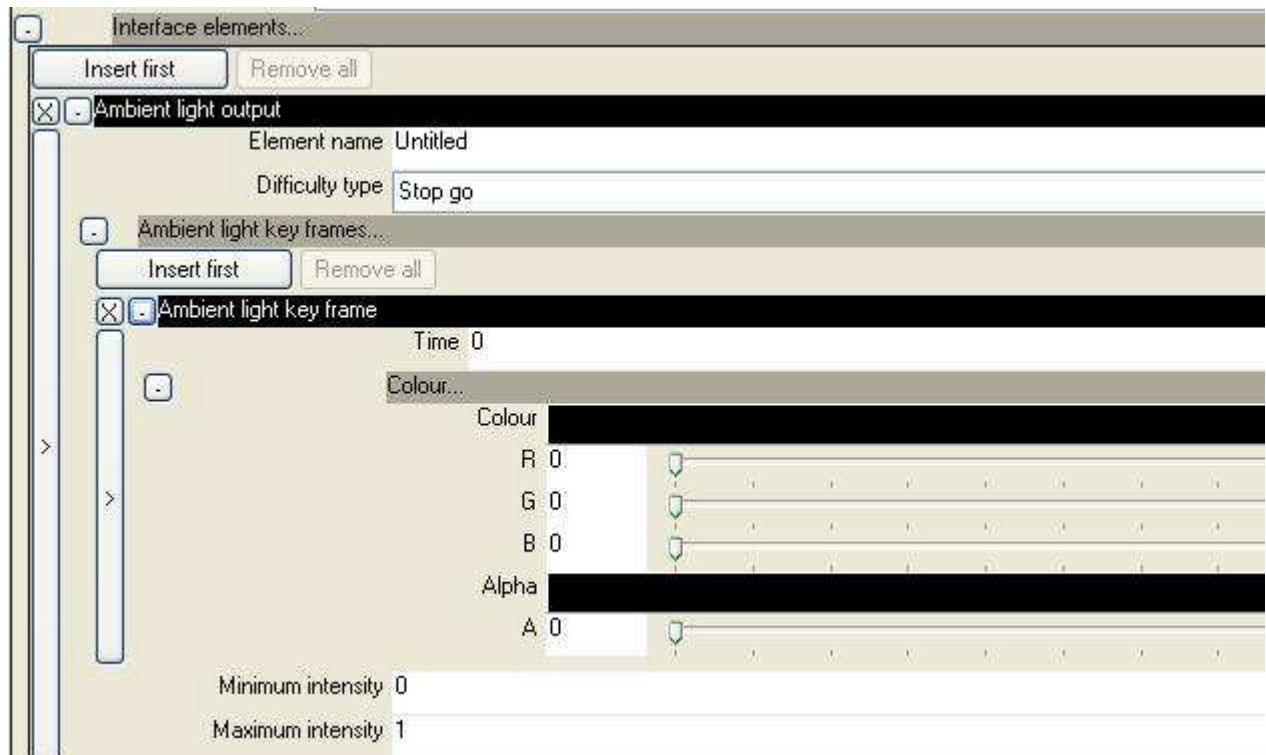
## 2.2 Interface Element

A number of Interface Elements may be added to each Control. An example of their use is to have a bulb that lights up when a control is turned on in the cab. The following types of Element are available:

- Ambient Light Output
- Exterior Animation
- HUD Element
- Interior Duo Switch
- Interior Geometry Input
- Interior Geometry Input Output
- Interior Geometry Output
- Interior Geometry Slave Output
- Interior Irregular Notched Lever
- Interior Lever
- Interior Multi-ref Lever
- Interior Notched Lever
- Interior Output Display
- Interior Push Button
- Interior Tri-Switch
- Interior Visibility Object

### 2.2.1 Ambient Light output

<Undefined>



#### 2.2.1.1 Element Name

A Description of the control. Free text.

#### 2.2.1.2 Difficulty Type

Stop Go / Stop Go Only / Intermediate / Expert

#### 2.2.1.3 Ambient Light Key Frame

##### 2.2.1.3.1 Time

##### 2.2.1.3.2 Colour

##### 2.2.1.3.3 Minimum Intensity

##### 2.2.1.3.4 Maximum Intensity



### 2.2.2 Exterior Animation

This is used for linking an external animation e.g. wipers to a Cab Control



#### 2.2.2.1 Element Name

Here you can input a description of the control. This text is used as reference only

#### 2.2.2.2 Difficulty Type

Which mode is this element applicable in?

Stop Go / Stop Go Only / Intermediate / Expert

#### 2.2.2.3 Animation ID

This is the name of the animation specified in the 3D model of the cab for this specific control.

#### 2.2.2.4 Anim Style

Once / Toggle / Continuous / Back and Forth Once / Back and Forth Continuous  
Choose the most appropriate style of animation.

### 2.2.3 HUD Element

<Undefined>

### 2.2.4 Interior Duo Switch

<Undefined>

### 2.2.5 Interior Geometry Input

<Undefined>

### 2.2.6 Interior Geometry Input Output

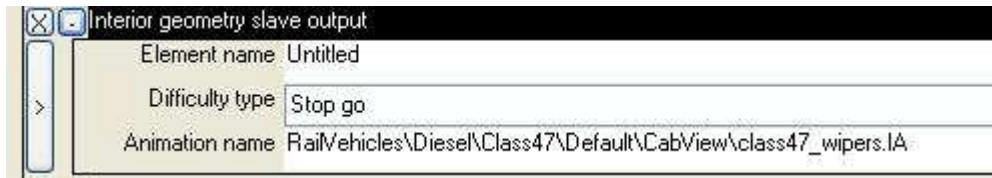
<Undefined>

### 2.2.7 Interior Geometry Output

<Undefined>

### 2.2.8 Interior Geometry Slave Output

This field is where you specify external animations that can be viewed from within the cab. E.g. the Wipers



#### 2.2.8.1 Element Name

Here you can input a description of the control. This text is used as reference only

#### 2.2.8.2 Difficulty Type

Which mode is this element applicable in?

Stop Go / Stop Go Only / Intermediate / Expert

#### 2.2.8.3 Animation Name

This is the location of the animation file.

### 2.2.9 Interior Irregular Notched Lever

This is used for Lever type controls with distinct and irregularly spaced notched positions

Interface elements...

Insert first Remove all

☒ ☐ Interior irregular notched lever

Element name TrainBrakeControl\_Intermediate

Difficulty type Intermediate

Pick transform name vacuum\_brake

Movement type Move left right

analog input sensitivity 0.5

Digital input sensitivity 0.5

Animation name RailVehicles\Diesel\Class47\Default\CabView\class47\_vacuum\_brake.IA

st in notched position False

☐ Notch...

Insert first Remove all

☒ ☐ Notch data

Identifier Release

Value 0

☒ ☐ Notch data

Identifier GraduatedSelfLapLimitedHolding

Value 0.30000001192092896

☒ ☐ Notch data

☒ ☐ Notch data

☒ ☐ Notch data

☒ ☐ Notch data

Interface elements...

Insert first Remove all

☒ ☐ Interior lever

Element name Damper

Difficulty type Expert

Pick transform name dampers

Movement type Move up down

analog input sensitivity 2

Digital input sensitivity 1

Animation name RailVehicles\Steam\5MT\_Black5\Default\CabView\Black5 dampers.IA

#### 2.2.9.1 Element Name

Here you can input a description of the control. This text is used as reference only

#### 2.2.9.2 Difficulty Type

Stop Go / Stop Go Only / Intermediate / Expert

- This setting 'filters down' so If you specify 'Stop Go' here the control will be usable in all three modes Stop Go, Intermediate and Expert as long as the control is also present in each Input Mapper.
- If 'Expert' is specified it is only usable in Expert mode not Intermediate or Stop Go.
- 'Stop Go Only' means that the control is only usable in Stop Go not the other two modes.

#### 2.2.9.3 Pick Transform Name

This is the Transform Name from the 3DS Max model of the cab. This value is needed for the Control to be operable with the Mouse.

#### 2.2.9.4 Movement Type

Move Left Right / Move Right left / Move Up Down / Move Down Up / Push Button / Push and Hold Button

Use the Type most appropriate to the movement and type of the Control

#### 2.2.9.5 Analog Sensitivity

This is the sensitivity of the Control when operated with the Mouse. The higher the value, the more sensitive the control i.e. the faster it moves

#### 2.2.9.6 Digital Sensitivity

This is the sensitivity of the Control when operated with the Keyboard. The higher the value, the more sensitive the control i.e. the faster it moves

#### 2.2.9.7 Animation Name

This is the link to .IA 3DS Max **Intermediate Animation** file. This needs to be specified for the control to Animate with the Keyboard

#### 2.2.9.8 Rest in Notch

This determines if the lever can be set in between notches or has to be at one of the notch positions and can't be left in between. If it is left between, it will settle to a notch position.

#### 2.2.9.9 Notch

Here you can specify the number of notches for the different positions on the lever.

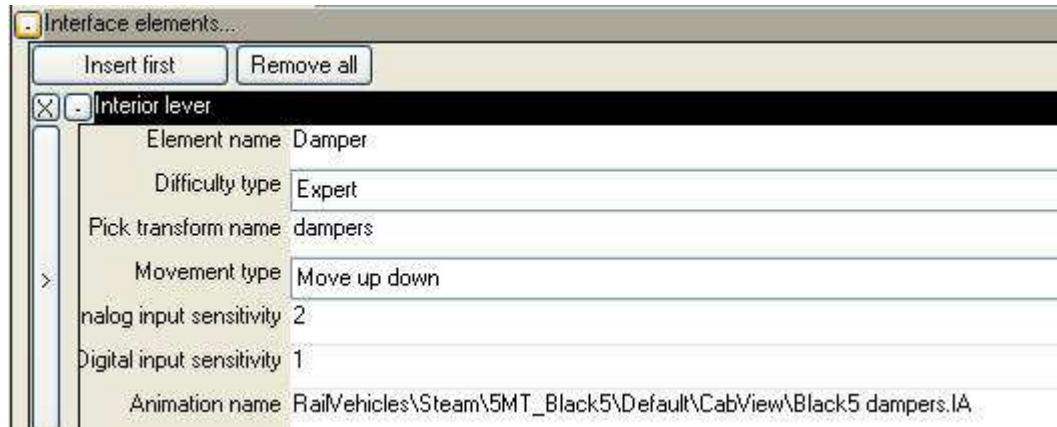
##### 2.2.9.9.1 Identifier

Here you can input a description of the control. This text is used as reference only

### 2.2.9.9.2 Value

This is the position of a specific notch on a scale of 0 to 1. e.g. 0.25 would be a quarter of the way through full movement of the lever

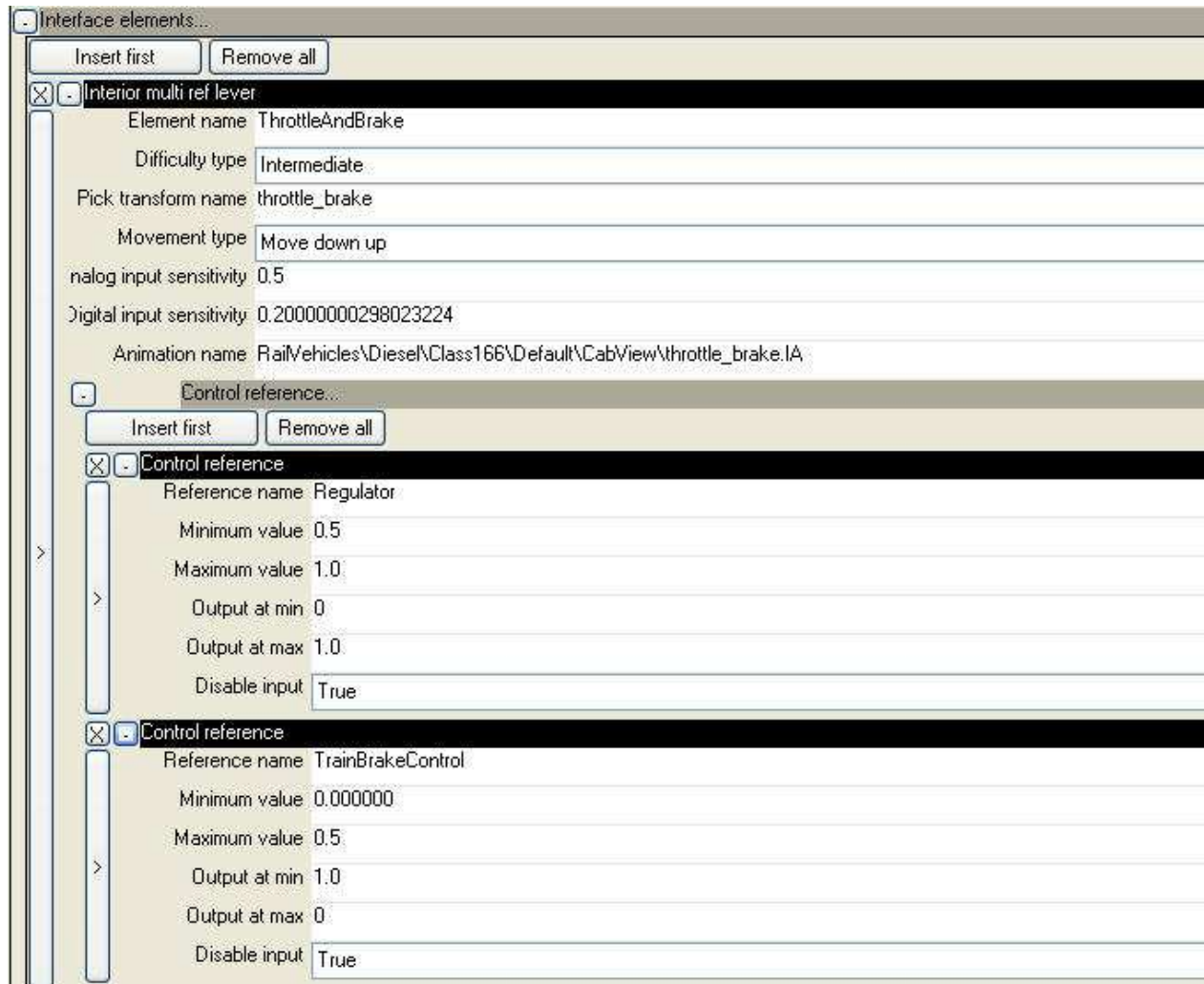
### 2.2.10 Interior Lever



Fields are as per 2.2.9 Interior Irregular Notched Lever

### 2.2.11 Interior Multi-Ref Lever

This is used to define a Combined Controller such as the Combined Brake / Throttle control in the Class 166. It allows two existing controls to be mapped on to one new one.



The screenshot shows the 'Interface elements...' dialog box with the 'Interior multi ref lever' section expanded. The 'Element name' is 'ThrottleAndBrake', 'Difficulty type' is 'Intermediate', 'Pick transform name' is 'throttle\_brake', 'Movement type' is 'Move down up', 'analog input sensitivity' is '0.5', 'Digital input sensitivity' is '0.20000000298023224', and 'Animation name' is 'RailVehicles\Diesel\Class166\Default\CabView\throttle\_brake.IA'. Below this, there are two 'Control reference' sections. The first 'Control reference' has 'Reference name' 'Regulator', 'Minimum value' '0.5', 'Maximum value' '1.0', 'Output at min' '0', 'Output at max' '1.0', and 'Disable input' 'True'. The second 'Control reference' has 'Reference name' 'TrainBrakeControl', 'Minimum value' '0.000000', 'Maximum value' '0.5', 'Output at min' '1.0', 'Output at max' '0', and 'Disable input' 'True'.

#### 2.2.11.1 Element Name

Here you can input a description of the control. This text is used as reference only

#### 2.2.11.2 Difficulty Type

Stop Go / Stop Go Only / Intermediate / Expert

- This setting 'filters down' so If you specify 'Stop Go' here the control will be usable in all three modes Stop Go, Intermediate and Expert as long as the control is also present in each Input Mapper.
- If 'Expert' is specified it is only usable in Expert mode not Intermediate or Stop Go.
- 'Stop Go Only' means that the control is only usable in Stop Go not the other two modes.

**2.2.11.3 Pick Transform Name**

This is the Transform Name from the 3DS Max model of the cab. This value is needed for the Control to be operable with the Mouse.

**2.2.11.4 Movement Type**

Move Left Right / Move Right left / Move Up Down / Move Down Up / Push Button / Push and Hold Button

Use the Type most appropriate to the movement and type of the Control

**2.2.11.5 Analog Sensitivity**

This is the sensitivity of the Control when operated with the Mouse. The higher the value, the more sensitive the control i.e. the faster it moves

**2.2.11.6 Digital Sensitivity**

This is the sensitivity of the Control when operated with the Keyboard. The higher the value, the more sensitive the control i.e. the faster it moves

**2.2.11.7 Animation Name**

This is the link to .IA 3DS Max **Intermediate Animation** file. This needs to be specified for the control

**2.2.11.8 Control Reference**

This is where the two controls that are being combined are added.

**2.2.11.8.1 Reference Name**

The name of the existing control e.g. "Regulator"

**2.2.11.8.2 Minimum & Maximum Values**

The Min and Max Values determine the proportion of the new Combined Control that the existing control takes. In the Example above, both the Regulator and Train Brake take an equal 50% of the Combined Controller, , the Train Brake from 0 to 0.5 and the Regulator from 0.5 to 1.

**2.2.11.8.3 Output at Min & Max**

These two values define how the existing controls linked by the new Combined Control work. In the above example as the Combined Controller goes from 0 to 0.5, the Train Brake goes from 1 to 0 (i.e. Full Apply to Full Release) and as the Combined Controller goes from 0.5 to 1.0, the Regulator goes from 0 to 1 (Idle to Full Throttle).

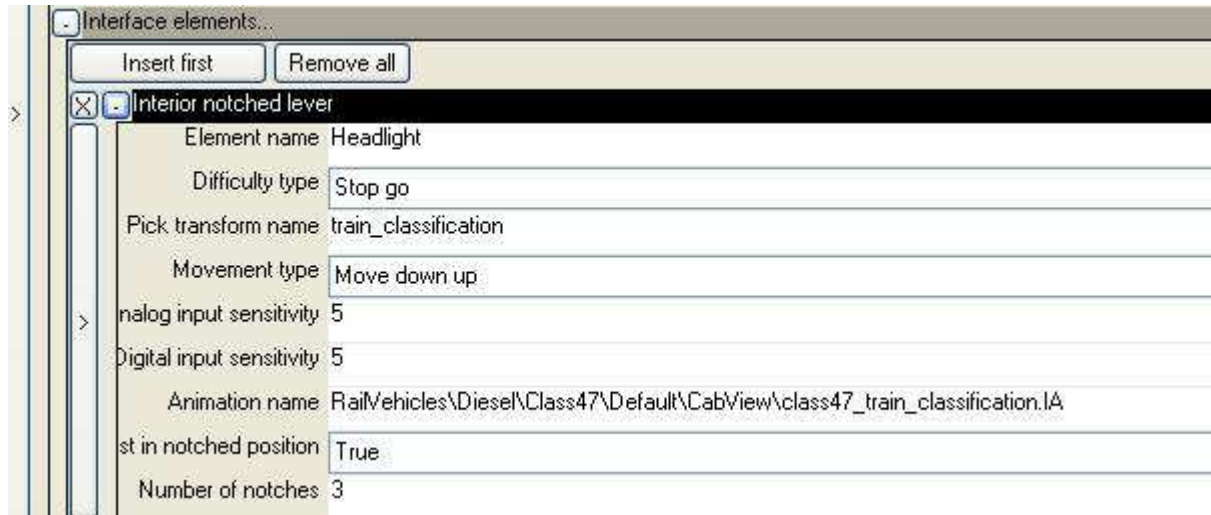
**2.2.11.8.4 Disable Input**

Values available: True / False

This determines if the keyboard controls for the existing controls still function. E.g. in the example above whether <'> and <;> for the Train Brake still work.

### 2.2.12 Interior Notched Lever

Used for Lever type controls with distinct and regularly spaced notched positions.



#### 2.2.12.1.1 Number of Notches

This specifies the number of notches, they will be spaced equally between 0 and 1. If, for example, 3 notches are specified, they will be at 0.3333, 0.6667 and 1.0

Other fields are as per 2.2.9 Interior Irregular Notched Lever

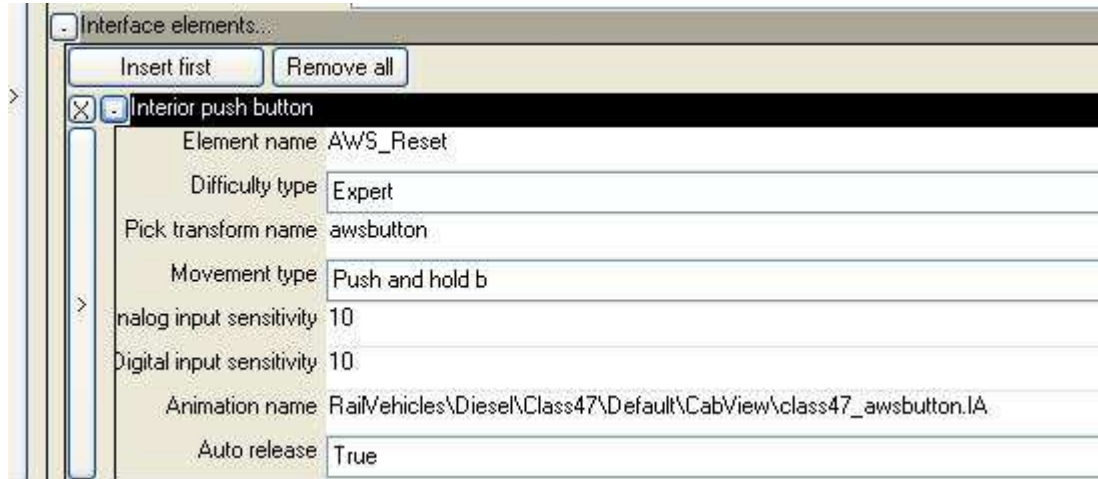
### 2.2.13 Interior Output Display

<Undefined>



### 2.2.14 Interior Push Button

Use for push button type controls



#### 2.2.14.1.1 Auto Release

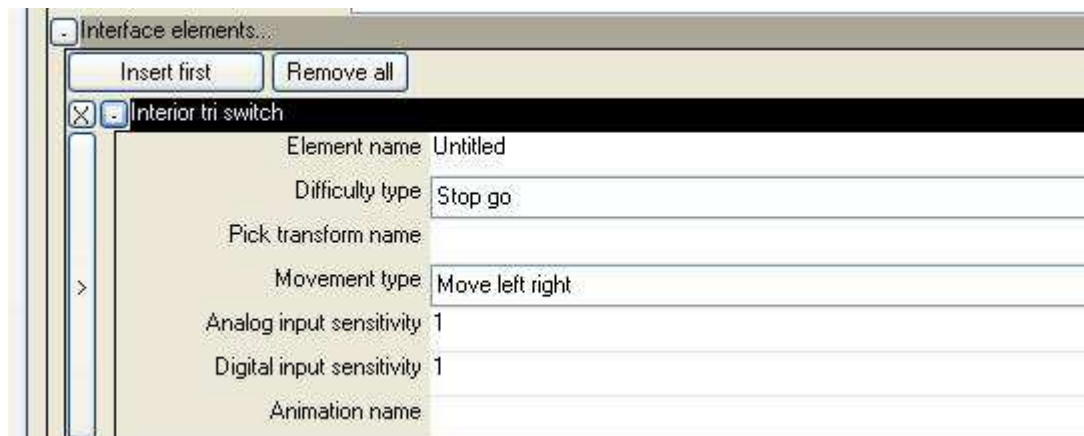
True / False

This value determines whether, when you release the button, it returns back to the 'Off' position. If 'True' then the button returns to the 'Off' position, if 'False' then it stays in the 'On' position

Other fields are as per 2.2.9 Interior Irregular Notched Lever

### 2.2.15 Interior Tri Switch

Use for 3 state switches



Fields are as per 2.2.9 Interior Irregular Notched Lever

### 2.2.16 Interior Visibility Object

Use for example, lights that light up when a control is used



#### 2.2.16.1 Element Name

Here you can input a description of the control. This text is used as reference only

#### 2.2.16.2 Difficulty Type

Stop Go / Stop Go Only / Intermediate / Expert

- This setting 'filters down' so If you specify 'Stop Go' here the control will be usable in all three modes Stop Go, Intermediate and Expert as long as the control is also present in each Input Mapper.
- If 'Expert' is specified it is only usable in Expert mode not Intermediate or Stop Go.
- 'Stop Go Only' means that the control is only usable in Stop Go not the other two modes.

#### 2.2.16.3 Lower Visibility Threshold

Below this value the Object is not visible

#### 2.2.16.4 Upper Visibility Threshold

Above this value the Object is not visible

#### 2.2.16.5 Transform Name

This is the Transform Name of the visible object from the 3DS Max model of the cab.

#### 2.2.16.6 Threshold Type

<Undefined>