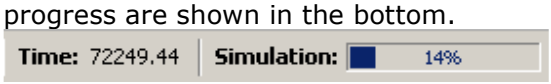
Calais Model User Guide

The model inside the zip archive is a process flow simulation model of the cargo screening process in Calais (French and English site). The development environment we used is called AnyLogic™. The model is still work in progress and has not been verified or validated yet, and much of the operational logic of the serviceShed object has still to be implemented. For this to be implemented successful we would require more insider knowledge about and data from the real system.

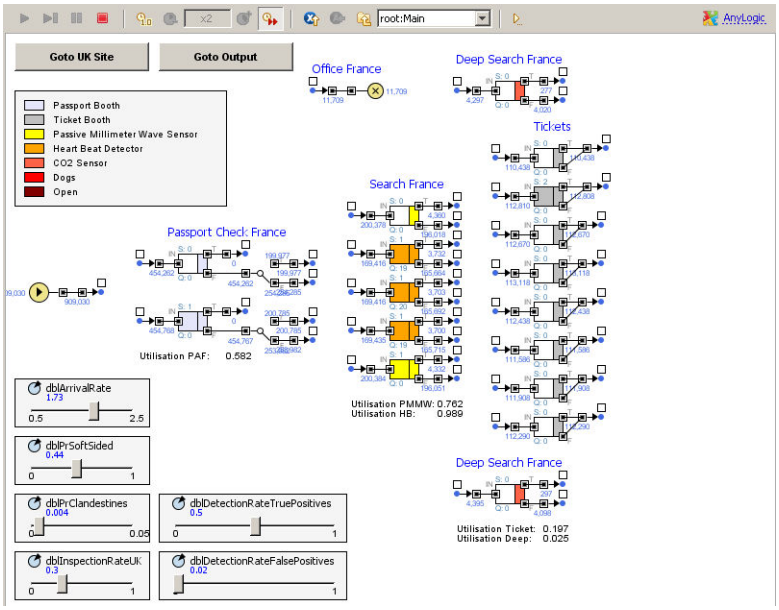
The model is presented in form of a java applet. Please unzip the archive and start the calaistest020.html file. You will then be presented with the experiment interface. In the top you have some controls. When the experiment is executed you can use these to restart, step through, pause, and stop the simulation.

You also have some controls to change the execution speed. The button on the right runs the simulation in virtual mode (i.e. as fast as possible)

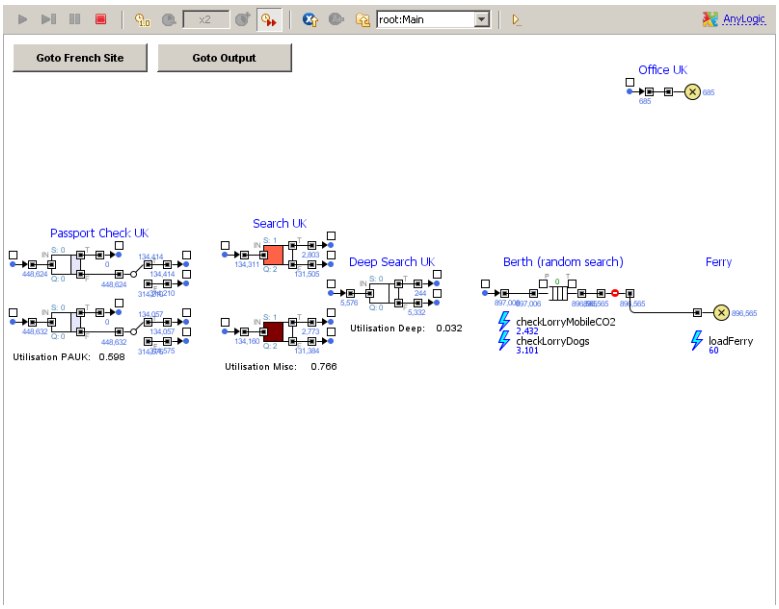
To start the experiment press the [Run the model and switch to main view] button. The overall runtime of the simulation is 1 year (525600 minutes). Current time and progress are shown in the bottom.



There are three screens to choose from. The screen that appears upon execution displays the operations on the French site. The two buttons in the top will lead to the operations on the UK site and the simulation output screen. In the bottom you can find some parameters you can change (during runtime). These parameters are arrival rate, proportion of soft sided lorries, proportion of positive lorries (i.e. one or more clandestines in it), the inspection rate at the two UK sheds, the sensor detection rate (currently all sensors have the same rate due to the lack of data), and finally the proportion of suspicious lorries that did not contain any clandestines.



The meaning of the box colours is explained in the legend at the top of the French site screen. If the colour appears on the right side of the box it indicates that these are the standard sensors/checks used/conducted at this station (white = multiple sensors). If the colours appears on the left side of the box they display the current state of the station (white = idle). The Berth area on the UK site has a different modelling concept (sensors are moving and targets are stationary) and therefore there are no colours indication the sensor type. Here dogs are used to inspect hard sided lorries and CO2 is used to inspect soft sided lorries.

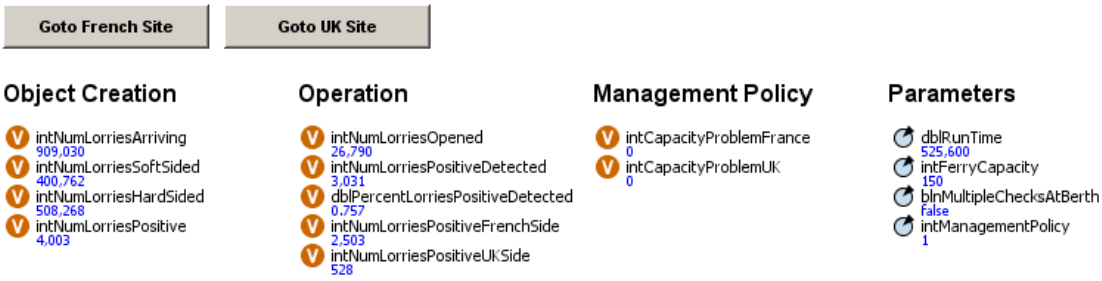


Once you had a look around on all screens and perhaps changed some of the parameter settings you should run the simulation in virtual mode to finish it quickly. You can then check the results by pressing the [Goto Output] button.

If you run the simulation with the default settings you should get similar values to the ones we found in the data sheets (see table) in the end. However these values vary from run to run as this is a stochastic simulation.

	Real System	Simulation
intNumLorriesArriving	907428	~ 908000
intNumLorriesPositiveDetected	2957	~ 2990

The results under [Object Creation] show the number of lorries created and how many of those are soft/hard sided and how many have some clandestines on board. The [Operation] section shows how many lorries were opened for check up, how many lorries have been detected with clandestines on board (number + percent of all lorries that have some clandestines on board), and on which side they have been detected. The section [Management Policy] lists some capacity problems. The current model runs a management policy where lorries are passing service sheds without inspection if queues in front are getting to long (over 70% of overall capacity). In this case more clandestines can pass through. Finally the [Parameter] section lists some operational parameters.



To get back to the start screen for conducting another experiment press the red button in the menu bar at the top.

Here are some scenarios one could try:

- What happens if the majority of lorries is soft sided and have to pass through PMMW? Change the [dblPrSoftSided] slider to 0.9 and observe the changes in [intCapacityProblemFrance]!
- What happens if a higher proportion of lorries is inspected at the UK site? Change the [dblInspectionRateUK] slider to 0.5 and observe the changes in [intCapacityProblemsUK]!
- What happens if the sensors are getting more effective? Change the [dblDetectionRateTruePositives] slider in steps of 0.1 from 0.5 to 0.8 and observe the changes in [intNumLorriesPositiveDetected]!