The Enigma Sim

The program is an exact simulation of the 3-rotor Wehrmacht & Luftwaffe, the 3-rotor Kriegsmarine M3, and the famous 4-rotor Kriegsmarine M4 model of the German Enigma cipher machine, as they were used during World War II from 1939 until 1945. You can select between the three models, choose different rotors or 'Walzen', preset the rotor wiring positions or 'Ringstellung' and switch letters by using plugs or 'Stecker'. The internal wiring of all rotors is identical to those used by the Wehrmacht, Luftwaffe and Kriegsmarine. This simulator is therefore fully compatible with the real Enigma-machine and you can decode original messages and make your own encoded text.

How to use the simulator

To prepare the Enigma Simulator for use, we need to select the reflector, the rotors and their order, adjust the ringsettings, insert the plugs and set the machine in the start position.

As you will notice, there will always be a little hand visible when you move the mouse to places where you can select or click something. You can also click or move the mouse over the white power label in the right top corner to call the Simulator Menu.
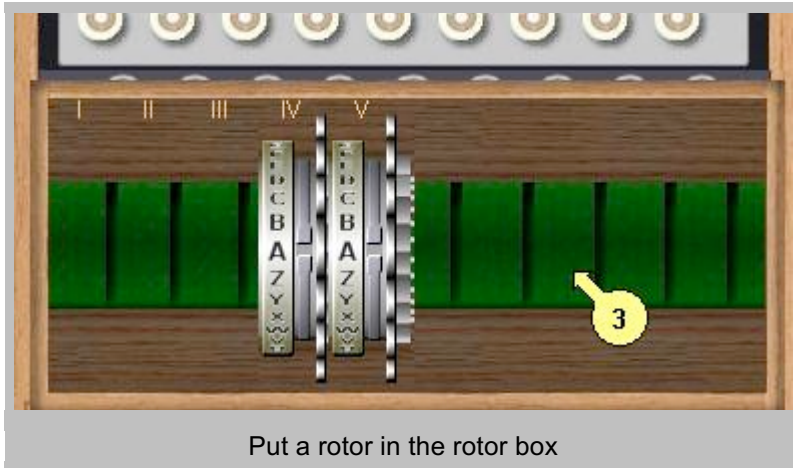
Setting the rotors in the proper positions

Click on the right lock [1] to open the cover and reveal the Enigma mechanism.


Opening the cover
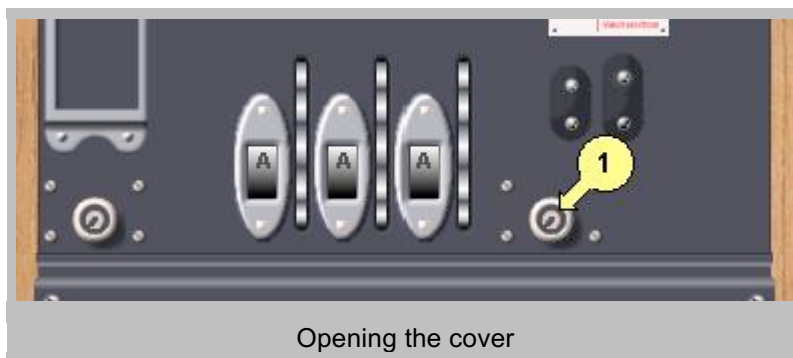
Click on a rotor [2] in the Enigma to lift it out of the machine and click on an empty place [3] in the rotor box to put that rotor in the box.

Lift out the rotor
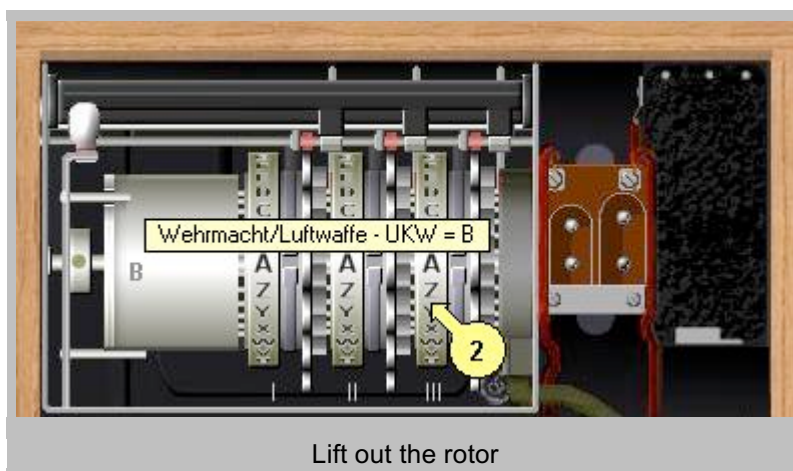
Put a rotor in the rotor box

Now you can select another rotor from the box. Once it is out of the box, you can adjust the 'Ringstellung' by clicking on the upper [4] or lower [5] half of the displayed rotor. When the rotor is adjusted, you must click on an empty place in the Enigma to place the rotor in that position. If you find it easier, you can lift out all the rotors and put them into the box first, and then select, adjust and insert them one by one in the machine.
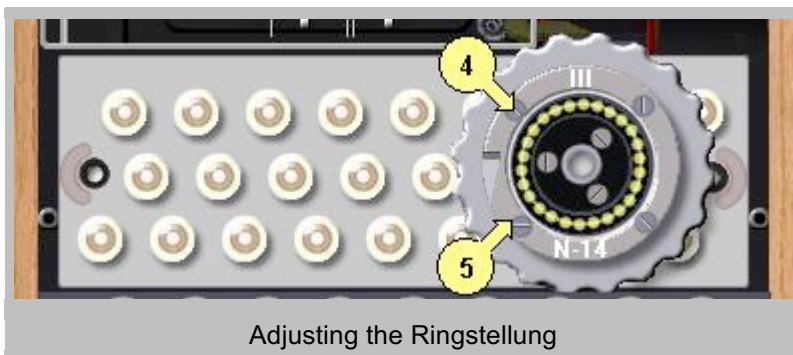


Adjusting the Ringstellung

Selecting the reflectors

You can change the reflector [6] by left-or right clicking the letter on the reflector. By changing the reflector, you can select the different Enigma models.
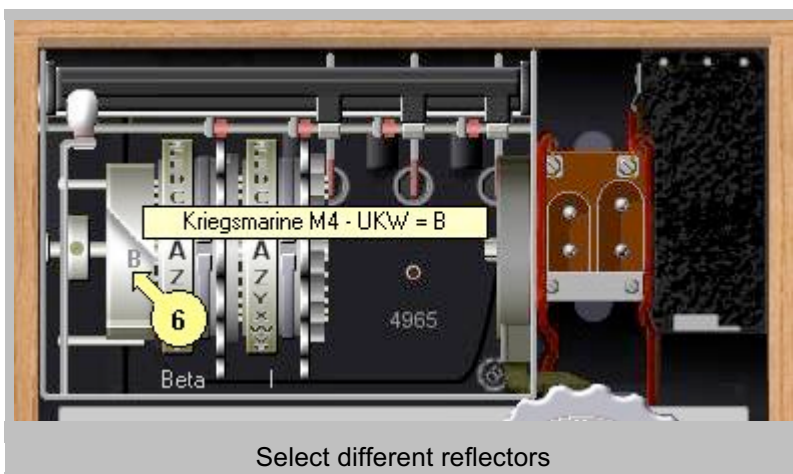
Select different reflectors

You will go through the wide B and C reflector from the 3-rotor Wehrmacht and Luftwaffe model, the wide B and C reflector from the 3-rotor Kriegsmarine M3, and the thin B and C from the 4-rotor Kriegsmarine M4 model. Notice that on the Wehrmacht-Luftwaffe model, you can select between five rotors and two wide reflectors, on the Kriegsmarine M3 between eight rotors and two wide reflectors, and on the M4 you have the choice between eight rotors, two special 'Zusatzwalzen' or Greek rotors named Beta and Gamma (which cannot advance) that are placed just before the thin reflector, and the two thin reflectors.

Once all rotors are in place you can close the cover by clicking on the handle [7] at the left, above the reflector.

Closing the cover
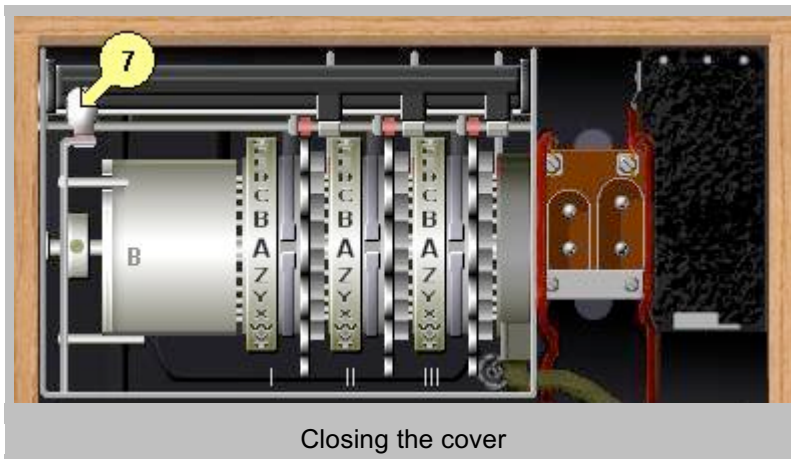
Special note on the rotors: If you use the M4 model with the thin B reflector and the Beta rotor as 4th rotor in 'zero-position' (rotor and ring set to A), the machine is compatible with its predecessor, the 3-rotor M3 model, and the 3-rotor Army model with wide B reflector (of course, they are compatible only when the other three rotors and the settings are the same). The rotor wirings were designed so that different components of the army could exchange messages, although they had different Enigma models

Connecting the plugs

To connect plugs from one socket to another (to switch the letter connections) you must click on the plugs at the bottom of the Enigma. The plugboard or 'Steckerbrett' will appear. Just click the desired socket [8] and the socket that you want to connect it to [9]. To clear a connection, just click one of the plugs [10] and both connected plugs dissapear. After finishing the plug settings you can return to the Enigma by clicking the keys on the top.

Plug settings
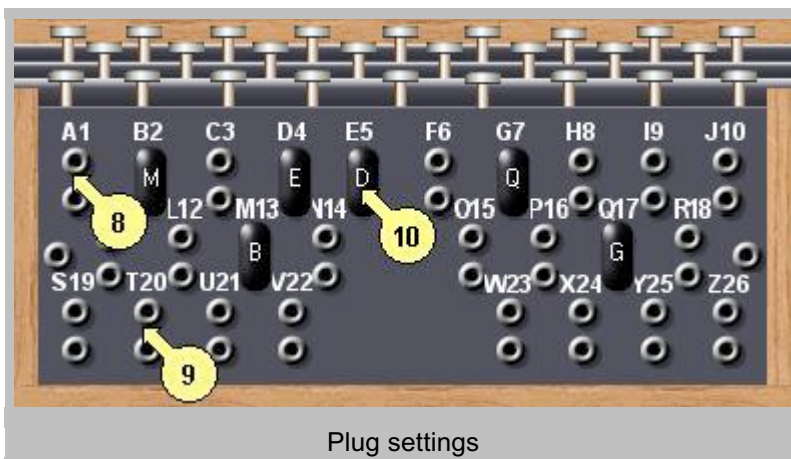
Setting the Start Position

On the main screen you can change the start position or 'Grundstellung' of the rotors by clicking the upper [11] or lower [12] half of the rotor's wheel. The start position can be saved temporary by pressing INS, and can be retrieved later by pressing HOME.

Adjust the rotor positions
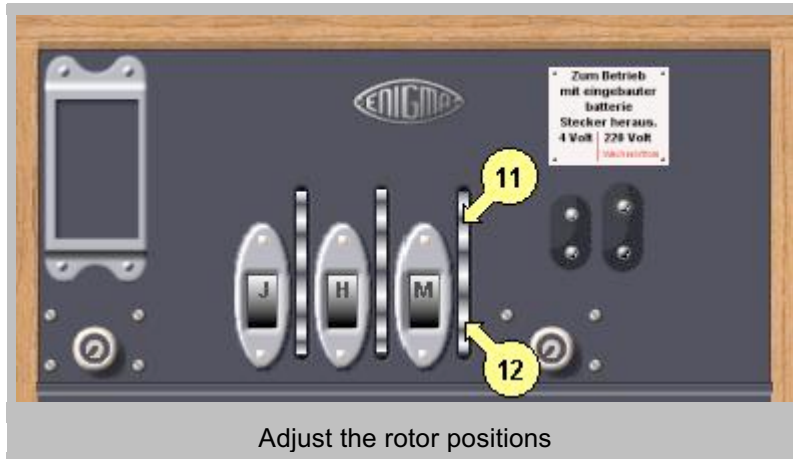
When all settings are finished, you can start encoding or decoding your messages. You can press with the mouse on the Enigma keys or use the keyboard. As long as the mouse is down or the key is pressed the lamp of the encrypted letter will light up.

The Text box and Clipboard

As an extra feature, you can display the encoded and decoded text in a window at the bottom of the Enigma by clicking the lock [13] on the wooden box. Press DEL or Backspace to clear this text box. Click again on the lock to hide the text box. This text box is a handy feature when coding long pieces of text. If you click in this text box or press F5, the Smart Clipboard Window appears. You can select in various ways how to format and transfer text to the clipboard. The text output is arranged in groups of five letters for the Wehrmacht machine and groups of four letters for both Naval M3 and M4 machines.

Calling the Text Box

Using the Auto Typing option

If you have a large amount of plain text or code that needs to be typed, you can use the Auto Typing Window. This window will appear if you press F6. In this window you can type, edit or paste pieces of text, or retrieve the content of the clipboard. You can select four different speeds of typing. Select 'Start' to begin processing the text. During the Auto Typing you can abort by pressing ESC. Make sure that all setting are finished and the rotors are in the start position before starting the Auto Typing.

Note: Auto Typing will only process alphabet characters and ignore all other characters like figures, signs and spaces. When decoding, make sure that there are no 'Kenngruppen' in the code text or delete the 'Kenngruppen' in the text window.

Save and Load Machine Settings

In the Simulator Menu (click the white power label) you can view the current machine setup and the file name, save the current settings or load other settings, or clear and return to defaul settings. The machine settings are save with the .eni extension. On startup the simulator will be loaded with the last used settings. If no settings file is found the default settings are loaded.

Exiting the simulator

To exit the Enigma simulator, just click on the power plug located in the upper right part of the Enigma. If desired, you can save the current rotor and plug settings (the rotor startpositions are not saved)

Cryptanalysis and test mode

For cryptanalysis and testing purposes, you can disable the rotor advance mechanism by using F10. A warning will be displayed above the rotors. Use F10 again to restore the rotor advance mechanism.

Extra's

Clicking the left lock will bring you to the picture gallery and clicking on the Enigma sign at the top will display the "about" window.