

Calculation

To perform a currency conversion, activate the display associated to the input currency (e.g. NLG) and type the amount you want to convert (e.g. 1354,50):

Then press Return or Enter to convert and display the result (e.g. 614,65 EUR).

Let's now describe in detail how this result is obtained. We'll consider 4 different situations: simple and multiple conversion, both with euro and national currency input.

National Currency to Euro Conversion

The Euro Assistant window lists two currencies, a national currency (i.e. an EMU national currency or a non-EMU currency) and EUR. The national currency's display is active (it's focused) and contains the amount you want to convert. After you press Return or Enter, Euro Assistant:

- rounds the input value according to the current rounding amount for the input currency;
- divides the obtained value by the input currency's conversion or exchange rate;
- rounds the obtained value according to the current EUR rounding amount;
- writes the result in the EUR display.

Euro to National Currency Conversion

The Euro Assistant window lists two currencies, a national currency (i.e. an EMU national currency or a non-EMU currency) and EUR. The EUR display is active (it's focused) and contains the amount you want to convert. After you press Return or Enter, Euro Assistant:

- rounds the EUR input value according to the current EUR rounding amount;
- multiplies the obtained value by the national currency's conversion or exchange rate;
- rounds the obtained value according to the current rounding amount for the national currency;
- writes the result in the national currency's display.

Multiple Conversion: Euro Input

he Euro Assistant window lists two or more national currencies (i.e. one or more EMU national currencies and not more than one non-EMU currency) and EUR. The EUR display is active (it's focused) and contains the amount you want to convert.

fter you press Return or Enter, Euro Assistant:

- rounds the EUR input value according to the current EUR rounding amount;

Then, for each listed national currency it:

- multiplies the rounded EUR input value by the national currency's conversion or exchange rate;
- rounds the obtained value according to the current rounding amount for that national currency;
- writes the result in the corresponding display.

ultiple Conversion: National Currency Input

he Euro Assistant window lists two or more national currencies (i.e. one or more EMU national currencies and not more than one non-EMU currency) and EUR. A national currency display is active (it's focused) and contains the amount you want to convert.

After you press Return or Enter, Euro Assistant:

- rounds the input value according to the current rounding amount for the input national currency;
- divides the obtained value by the input currency's conversion or exchange rate;
- rounds the obtained value according to the current EUR rounding amount;
- displays the result in the EUR display.

Then, for each listed output national currency it:

- divides the rounded input value by the input currency's conversion or exchange rate and multiplies the result by the output currency's conversion or exchange rate;
- rounds the obtained value according to the current rounding amount for that output national currency;
- writes the result in the corresponding display.

Reconversion Errors

If you perform a conversion from a currency with a rounding amount of low intrinsic value to a currency with a rounding amount of high intrinsic value and then convert the result back to the original currency, then a reconversion error may occur, that is the final result may slightly differ from the input value.

Let's consider for instance a conversion from ITL to EUR, with ITL rounded to 1 ITL and EUR rounded to 0,01 EUR. The ITL rounding amount has a lower intrinsic value than the EUR rounding amount ($1 \text{ ITL} \approx 0,0005 \text{ EUR} < 0,01 \text{ EUR}$). Therefore if you convert an ITL amount to EUR and then back to ITL, the final amount may differ from the initial amount.

1.936,27 EUR =

167,85 EUR

325.000 ITL = 325.000 /

167,8484922... EUR \approx

167,85 EUR = 167,85 * 1.936,27 ITL =
325.002,9195 ITL \approx 325.003 ITL

Conversely, if you perform a conversion from a currency with an high intrinsic value rounding amount to a currency with a low intrinsic value rounding amount and then convert the result back to the original currency, then no reconversion error occurs. Considering this time the EUR to ITL conversion, we have for instance:

$$\begin{aligned} 250,00 \text{ EUR} &= 250,00 * 1.936,27 \text{ ITL} = 484.067,5 \text{ ITL} \approx 484.068 \text{ ITL} \\ 484.068 \text{ ITL} &= 484.068 / 1.936,27 \text{ EUR} = 250,002582... \text{ EUR} \approx 250,00 \text{ EUR} \end{aligned}$$

Reconversion errors may occur when you switch to another display after having performed a conversion. This happens because Euro Assistant always considers the focused display as input display: when you activate a new display, Euro Assistant automatically performs a new conversion with the new active display's content as input amount.

Let's consider the following example: convert 30.000 ITL to ATS, DEM and EUR, then click the DEM display to activate it. Euro Assistant performs a second conversion with 30,30 DEM as input amount. A reconversion error occurs ($29.997 \text{ ITL} \neq 30.000 \text{ ITL}$) and the ATS amount slightly changes, because now it is the result of the conversion of 30,30 DEM. The EUR amount is unaffected, because the EUR rounding amount (0,01 EUR) is the one with the highest intrinsic value.

Calculating and Converting Expressions

It is not unusual that you have to convert the result of a calculation - typically a sum or a percentage. Euro Assistant gives you the possibility to enter an algebraic expressions into the active display, to calculate its result and to convert this result.

To tell Euro Assistant you are about to enter an expression, type Equals ('='). Then enter your expression. Euro Assistant supports the 4 algebraic operators ('+', '-', '*', '/') and parentheses ('(', ')').

press Return or Enter to end your entry. Euro Assistant first checks the expression's syntax. In case of incorrect syntax, it beeps and waits for you to correct the mistake. In case of correct syntax it calculates the expression's result. If the result exceeds Euro Assistant's calculation range (the input amount must range from -100.000.000.000 to 100.000.000.000) or is invalid (e.g. your expression contains a division by zero), Euro Assistant writes 'E r r o r' in the active display and zeroes its content. In case of correct syntax and valid result, Euro Assistant writes the rounded result in the active display and converts this amount to all other listed currencies.

Notice that Euro Assistant is "frozen" during the introduction of an expression: most menu commands are disabled, the two buttons in the Euro Assistant window (the Rate button and the Rounding button) are disabled and you can't switch to another display or to another currency.

Algebraic expressions can also be pasted from the clipboard to the active display. In this case '=' can be omitted. If the syntax of the clipboard content is incorrect, then zero is pasted. If the result of the clipboard expression is invalid or exceeds Euro Assistant's calculation range, then 'E r r o r' is displayed in the active display and zero is pasted.

In case of correct syntax and valid result, Euro Assistant pastes the rounded result in the active display and converts it to all other listed currencies.

Calculation Range

Euro Assistant accepts input amounts whose absolute value ranges from 0 and 100.000.000.000.