



## **iLabPOS – Point of Sale and Stock Management Software Rounding and Precision**

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# Version 1.0

# 1. Explanation

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On VAT Applicable products, rounding and decimal point precision is a headache. Discrepancies will mostly occur when selling large quantities of low cost items. In reality there is no perfect solution to this problem. In this document we will try to explain the workings, why this happens, and what the best option is.

## Example 1 - Product selling at EUR 0.60 incl. 18% VAT

Let us say you have a product which sells at EUR 0.60 off the shelf. Excluding VAT, the price with up to 3 decimal places will be EUR 0.508 (.60 / 1.18).

### Client buys one:

18% VAT = EUR 0.091  
 EUR 0.508 + EUR 0.091 = EUR 0.599  
 Round to decimal places = EUR 0.60

So far so good. Problems start when selling large quantities....lets see

### Client buys 100:

#### Option 1 - Add VAT After Multiplying by Qty

EUR 0.508 x 100 = EUR 50.80  
 18% VAT Collected = EUR 9.144  
 Total Not Rounded = EUR 59.944  
 Rounded Total for Client = EUR 59.94

Mathematically we have calculated everything correctly, however we are still left with a discrepancy of 6 cents. The client would naturally expect to pay EUR 60.00 for 100 items at EUR 0.60.

#### Option 2 - Add VAT before Multiplying by Qty

EUR 0.508 + EUR 0.091 (18% VAT) = EUR 0.599  
 VAT Collected: 59.90 - 50.80 = EUR 9.10  
 EUR 0.599 \* 100 = EUR 59.90

Again, mathematically we have calculated everything correctly, however this time we are left with a bigger discrepancy of EUR 0.10.

#### Option 3 - Round to 2 decimal places before Multiplying Qty

EUR 0.508 + EUR 0.091 (18% VAT) = EUR 0.599  
 Unit Selling incl. rounded to 2 decimal places = EUR 0.60  
 EUR 0.60 \* 100 = EUR 60.00

Option 3 with rounding to 2 decimal places before multiplication looks perfect. Unfortunately mathematically it is the worst of them all (This option is in fact not offered on iLabPOS).

Why? In an invoice we need to show the price excluding VAT and the VAT. So what would we be showing in this case?

Price excl. VAT per unit = EUR 0.508  
 Total NET (x 100) = EUR 50.80  
 Total Gross = EUR 60.00

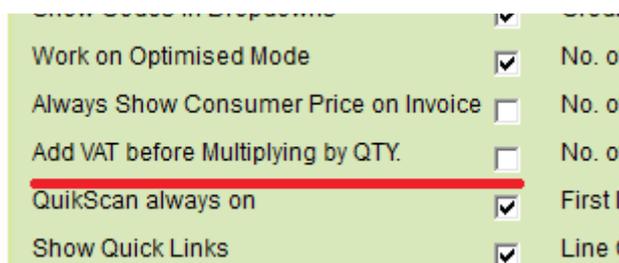
But EUR 60.00 - EUR 50.80 = EUR 9.20

Which is much more VAT being collected than options 1 and 2. In this case we have a discrepancy of EUR 0.10, however on several sales the amount will become much larger.

## Conclusion

iLabPOS offers options 1 and 2. Option 3 is not accepted by accounting standards as it results in too much of a discrepancy, and is not implemented in iLabPOS.

Whilst both options are correct, our advice is to preferably utilise option 1. To utilise Option 1, go to "File" >> "Preferences", and untick the option "Add VAT before Multiplying by QTY". To use option 2, tick this checkbox.



Option 1 will result in the least discrepancy possible when calculating figures for accounting purposes, especially over a wide period of time with many invoices.

However, whilst option 1 will cause you less problems with you accountant, it might cause you more problems with you customers. Just look at the example above, where you are selling an item at EUR 0.599. Option 2 precisely calculates the total for 100 units at EUR 59.90. However option 1, whilst mathematically more correct in VAT, comes up with a total of EUR 59.94, thus charging the client 4 cents more!