

In Too Tolerance (Universal Windows Platform application)

Operation manual Ver. 1.1 (2020/ 3/10)

At the beginning: This application's characteristics are: number change by "direct touch to number" and automatic calculation of result. No explanation is necessary for basic calculations, I think. This manual includes only the minimum functional description. Word "Touch" in this manual is assuming touchscreen. If you use different point device like mouse, please replace it with the corresponding operation.

Attention: Please check by yourself carefully any value, if you use it to practical purpose.

I make no warranty and can't respond to claims of any kind of damage.

I have developed and checked this application with Surface Pro, its keyboard, and attached mouse. I follow rule of Universal Windows Platform, and I have corresponded and checked different screen resolution, so I believe it works on any models without a problem, but I can't guarantee. If you encounter this application's trouble, I wish you to inform me it with as much as possible detailed information like equipment specs, etc.

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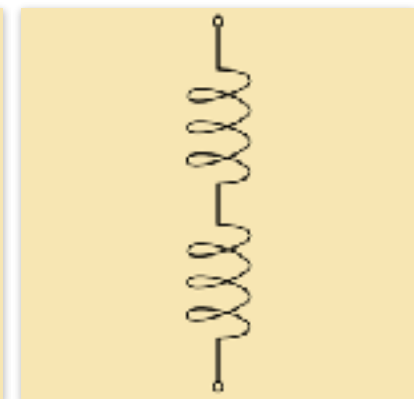
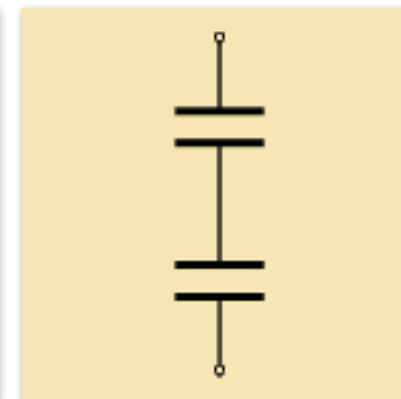
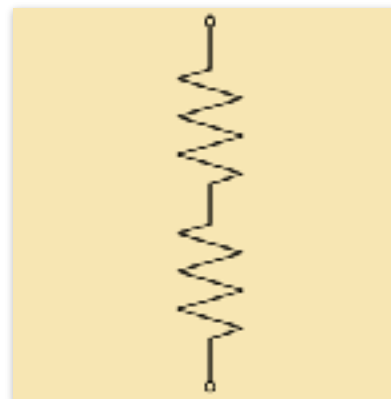
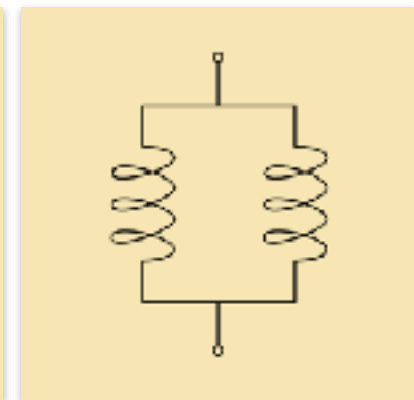
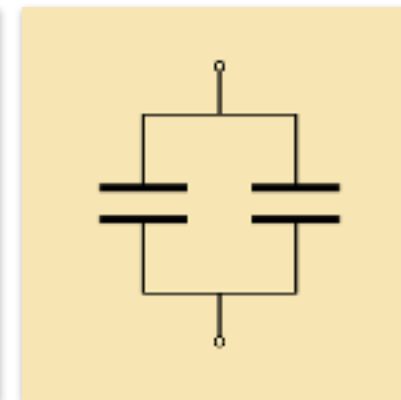
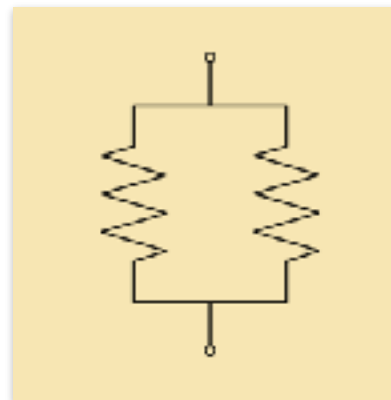
P.11 Modification history

Attached calculations in this Application

This application is specialized to calculation of analog limited items in digital circuit confirmation. It has 6 sheets.
By scrolling right and left (Touch dark color behind and move right or left), you can switch the sheet to another sheet

1. Circuit elements (resistor, condenser, coil) serial or parallel connection sheet and its minimum - maximum range sheet

Resistor1 Typ.(Ω)	380.00k	Resistor1 Min.(Ω)	342.00k
Resistor1 Tol.(%)	-10.00~ 10.00	Resistor1 Max.(Ω)	418.00k
Resistor2 Typ.(Ω)	4.20k	Resistor2 Min.(Ω)	3.99k
Resistor2 Tol.(%)	-5.00~ 5.00	Resistor2 Max.(Ω)	4.41k
Parallel Resistor Typ.(Ω)	4.15k	Parallel Resistor Min.(Ω)	3.94k
Parallel Resistor Tol.(%)	-5.06~ 5.05	Parallel Resistor Max.(Ω)	4.36k



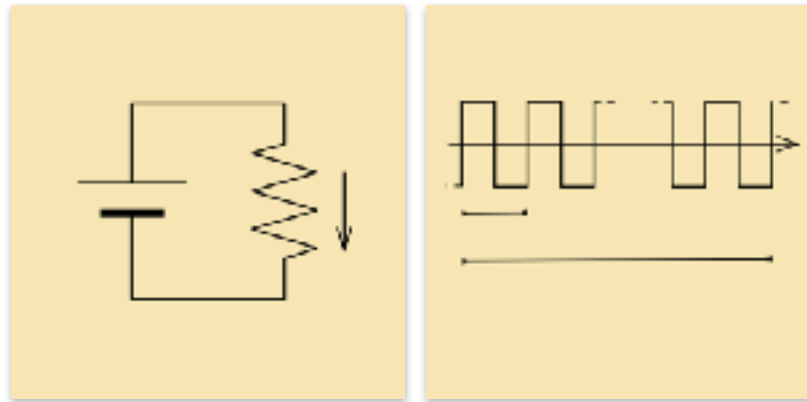
Circuit diagram is hidden from calculation sheet because it may be unnecessary after understanding this specification. It appears when its button is touched. (P.9)

2. Ohm's law. frequency/time conversion sheet, and its minimum - maximum range sheet

By 2 values variation in the range, 1 result value varies in the largest range. The location is indicated by * mark.

Resistor Typ.(Ω)	240.00k	Resistor Min.(Ω)	216.00k
Resistor Tol.(%)	-10.00~ 10.00	Resistor Max.(Ω)	264.00k
Current Typ.(A)	21.00μ	Current Min.(A)	20.79μ
Current Tol.(%)	-1.00~ 1.00	Current Max.(A)	21.21μ
Voltage* Typ.(V)	5.04□	Voltage* Min.(V)	4.49□
Voltage* Tol.(%)	-10.90~ 11.10	Voltage* Max.(V)	5.60□

Resistor Typ.(Ω)	240.00k	Resistor Min.(Ω)	216.00k
Resistor Tol.(%)	-10.00~ 10.00	Resistor Max.(Ω)	264.00k
Current* Typ.(A)	21.00μ	Current* Min.(A)	18.90μ
Current* Tol.(%)	-10.00~ 12.22	Current* Max.(A)	23.57μ
Voltage Typ.(V)	5.04□	Voltage Min.(V)	4.99□
Voltage Tol.(%)	-1.00~ 1.00	Voltage Max.(V)	5.09□



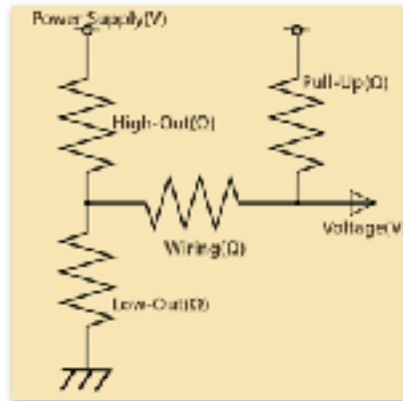
By scrolling up or down (Touch dark color behind and move up or down), you can switch another calculation on the sheet. (In 1. 2. sheets, both 1. and 2. are switchable. In 3. 4. sheets, peculiar 2 calculations are switchable.) * mark location can be switched in this selection.

Thin color squares are either number input field or calculation result field. You can switch these by touch. (P.9)

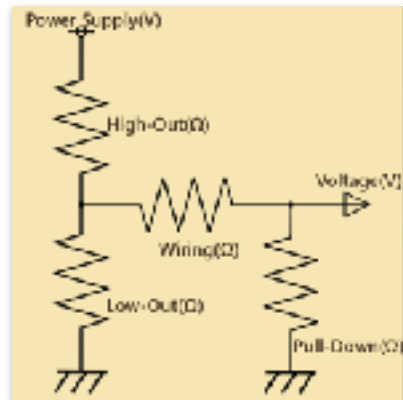
Depending on window size, following items are switched. Display length 9-digits or 13-digits, 1 sheet or 2 sheets pair, and vertical or horizontal.

3. Input voltage calculation by the real circuit resistance from digital output, through wiring, to digital input

Voltage(V)	3.24 □
Power Supply(V)	5.00 □
High-Out(Ω)	30.00k
Low-Out(Ω)	160.00k
Wiring(Ω)	100.00k
Pull-Up(Ω)	420.00k

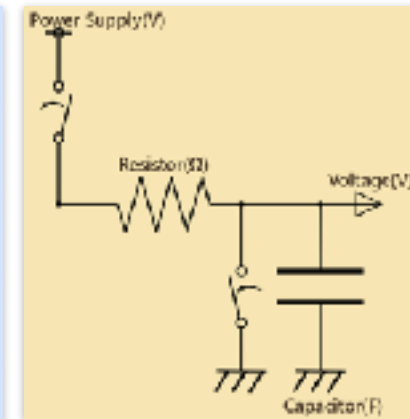


Voltage(V)	4.39 □
Power Supply(V)	5.00 □
High-Out(Ω)	30.00k
Low-Out(Ω)	160.00k
Wiring(Ω)	100.00k
Pull-Down(Ω)	420.00k

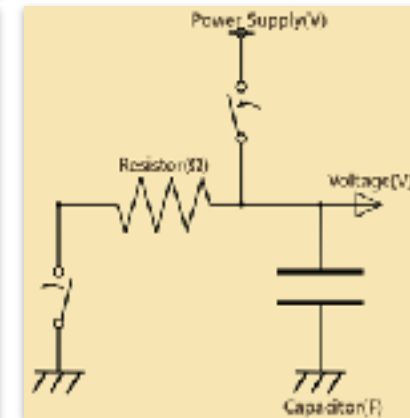


4. Curved level calculation of digital wave by the real circuit capacitance and resistance

Voltage(V)	3.44 □
Power Supply(V)	5.00 □
Percent(%)	68.86
Resistor(Ω)	450.00k
Capacitor(F)	120.00p
Charge Time(sec)	63.00 μ



Voltage(V)	1.56 □
Power Supply(V)	5.00 □
Percent(%)	31.14
Resistor(Ω)	450.00k
Capacitor(F)	120.00p
Discharge Time(sec)	63.00 μ



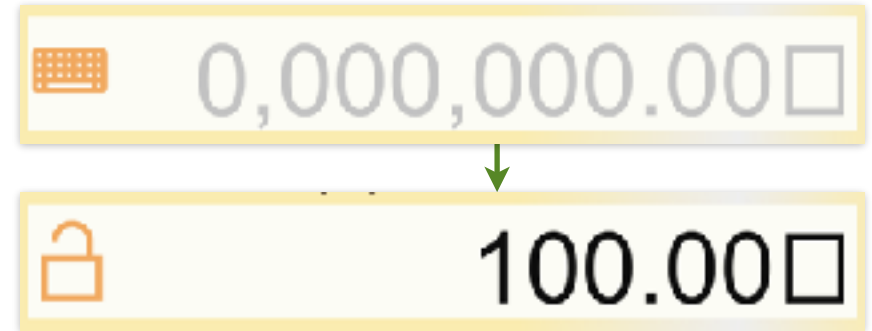
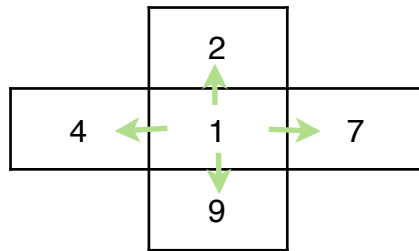
Number Input

There are 4 ways to input number. (①Touch to number itself ②Copy/Paste ③Software keyboard ④Hardware keyboard)

① Touch to number itself

In number input field, if it is initial state, input guide is dimmed.
(Right figure)

Touch directly the digit in the guide, the most significant digit location of number you want to input. The digit changes to below table number depending on following action. (Release without move/Up/Down/Right/Left)
Operate slowly. Stop a moment after touching and then move.



Adjust to aimed number by similar repeated touch actions to each digit.

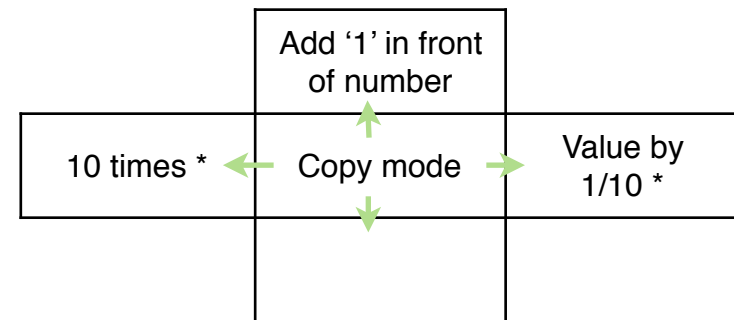
Square after number indicates no prefix. You can choose prefix by touch and following action (Release without move/Up/Down).

After this, motion differs depending on whether on blank or on number, and following action. (Release without move/Up/Down/Right/Left)

On number, below left table operations work. Only when moving up or down, continuous operation works for adjusting the value.



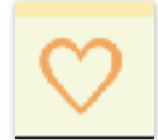
On blank, below right table operations work.



* mark function doesn't work on range input.

② Copy/Paste

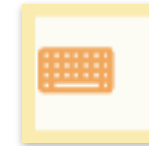
- (1) Touch and release on blank in front of the number you want to copy. Its color turns to thin.
- (2) Touch and release in destination number input field. The value (1) is pasted. The value is rounded following the settings (P.10).
Or touch again on the same (1). The value is stored in clipboard.
- (3) By a touch on blank in front of input guide, the value in clipboard is pasted.
In copy/paste operation, memory button (Right figure, bottom of sheet) is possible to use instead of number.
When memory holds a value, the symbol is filled.



- (4) **Copy/Paste of whole sheet:** Touch and release without move on dark color behind. Select from appearing popup menu.
(Selector is shown in the case only it works.)
By copy choice, whole sheet text is stored in clipboard. By paste choice on another sheet, the clipboard content is recalled on it.
And you can paste it into different application like Excel, NotePad.

③ Software keyboard

Keyboard (P.8) appears by touch to the left side button (Either of right figure) in the number field.



④ Hardware keyboard

You can use hardware keyboard for number input. If software keyboard is on screen, the key input is entered on it. Otherwise, the key input is entered in number input field with keyboard button (Right figure). When 2 sheets are on screen, left sheet is entered. Until [Enter] key press, the number is not fixed.



* Clear of number

By touch to the eraser button (Right figure, bottom right of sheet), whole sheet on screen is cleared.
As a prevention of calculation loss by miss touch, it doesn't work by short touch. Memory is held in sheet clear.
When you want to clear only one number or a memory, select it by the Copy/Paste(1) operation, and touch eraser button.



Keyboard

3 Keyboards (number with prefix, tolerance range, percent) are equipped and suitable keyboard is automatically selected corresponding to the content. (Below is tolerance range keyboard)

Current Tol.(%) ← Label of the inputting number.

-3.5~8.2 ← This displaying number is stored. Touch correction to number is possible. After storing, it is rounded according to the setting (P.10). If it is blank, nothing is stored.

7 8 9 ← Clear inputted number. It doesn't work by short touch. (Hard key [Del])

4 5 6 ← Delete last 1 character.

1 2 3 ~ ← Separator between lower limit and upper limit.

0 . +/- ± ← When lower limit and upper limit absolute values are the same. (Hard key [+])

← Switch plus and minus. (Hard key [-])
Lower limit '-' is automatically added. It is not necessary to input in normal case.

✓ ← Finish number input and **quit** this sheet. (Hard key [Enter])

Below shown reference table to hard key of any keyboards consists from only hard things to guess from key top.

[e±]	→	[,]
[00]	→	[Space]
prefix	→	No

Other operations

* Calculation result field

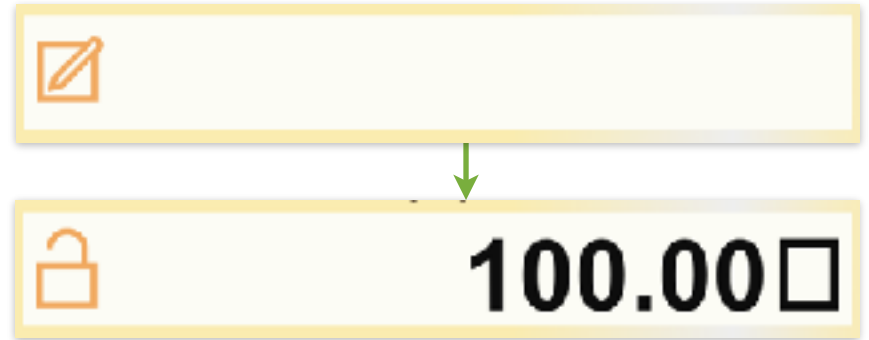
In calculation result field, before calculation, blank is displayed (Right figure).

At the time inputted number amount reaches to the possible level, the calculation is automatically done and the result is displayed when it is in the range.

The calculation result is rounded according to the setting (P.10) and displayed in thick.

Touch to calculation result field, regardless of which blank or result, changes it to number input field.

(However, there are cases logically impossible. Neither software keyboard nor lock button works in the situation.)

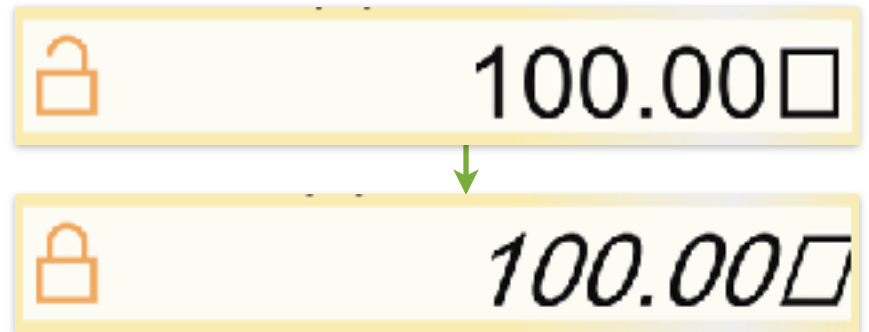


* Lock of number

Lock button is displayed left side of both number inputted and calculated (Right figure). The number is locked by touch to the button.

The value is held while locking. However, it changes by reset or reload operation (P.10).

Re-touch to lock button releases this lock state. As a prevention of value change by miss touch, it doesn't work by short touch.



* Setting change

Settings sheet (P.10) appears by touch to the gear button (Right figure, bottom left of sheet).

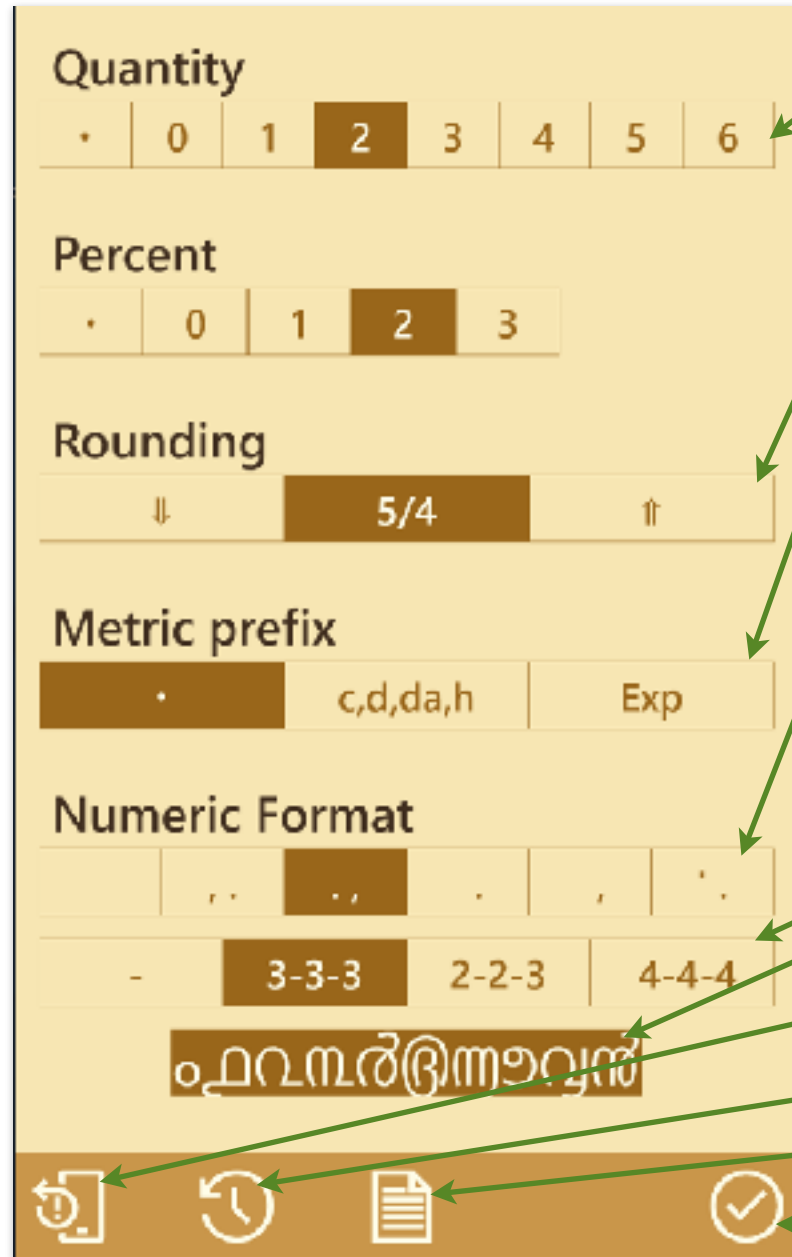


* Circuit diagram

Circuit diagram sheet (P.3-5) of present calculation appears by touch to the circuit button (Right figure, bottom of sheet).



Settings



Number is classified 2 kinds(Quantity/Percent(%)).
Choose decimal part length for each.'.' is full digit display.(Until 9 or 13 digits.
Digit is reduced depending on format.)

Rounding rule is same in all numbers. (Round down/Round off/Round up)

Metric prefix multiple of 3, full metric prefix or exponential format.

Decimal point/Separator character

Blank: Default of the unit

- ., : 1,234,567,890.
- ., : 1.234.567.890,
- . : 1 234 567 890.
- , : 1 234 567 890,
- ' : 1'234'567'890.

Separator location

- : 1234567890.
- 3-3-3 : 1,234,567,890.
- 2-2-3 : 1,23,45,67,890.
- 4-4-4 : 12,3456,7890.

Number type

19 type numbers are available and switched by touch.
(Up/Down)

Reset: Use it only when you want to initialize this application.

Reload the situation this application started. It doesn't work by short touch.

Show this manual.

Finish these settings and **quit** this sheet.

Modification history