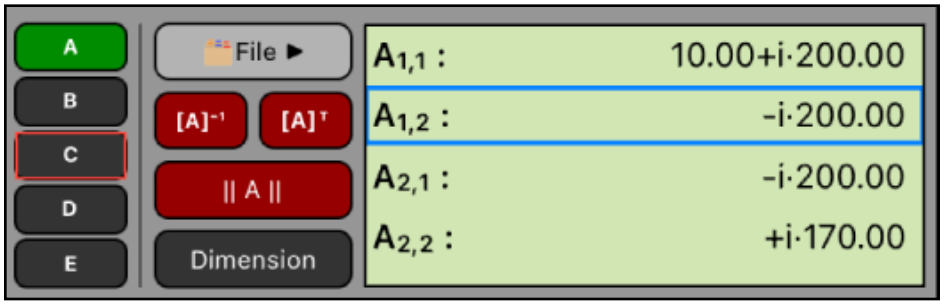
Matrix Worksheet



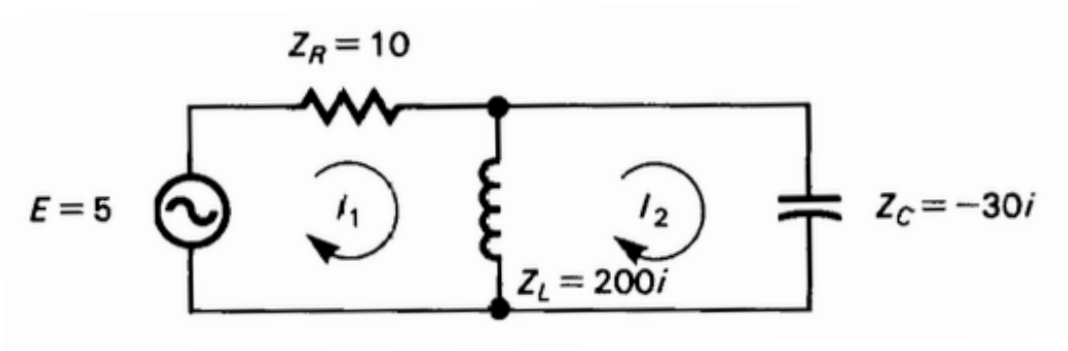
This worksheet complement the Matrix operations of the calculator. It allows to create and edit any of the five matrices ("A" to "E") and to perform basic matrix functions in an easy and direct way.

Matrix Worksheet Buttons	
[A], **[B]**, **[C]**, **[D]** or **[E]**	Select the current matrix (assumes matrix "A" is selected). The button with a red border indicates the current "RESULT" matrix.
[File ▶]	Shows the Matrix file menu.
New	Clear the current matrix.
> Load	Loads a previously saved matrix file into the current matrix.
Save…	Save the current matrix into a matrix file.
> Delete	Shows all matrix files to select the one to delete.
[A]$^{-1}$	Invert the selected matrix and replaced it with the resulting matrix.
[A]^{T}	Transpose the selected matrix and replaced it with the resulting matrix.
|| A ||	Calculates the determinant of the selected matrix and enter it to the calculator's stack-X.
[Dimension]	Sizes the selected matrix to stack-Y number of rows and stack-X number of columns.

Note that in RLM-15CX, the matrices "A" to "E" can be complex matrices, so the transformations (Matrix 4, Matrix 5, Py,x and Cy,x) are not necessary to operate with them.

To better understand how this worksheet works, follow the next examples carefully.

Example: (Complex Simultaneous linear equations)
Calculate I_1 and I_2 from the electric circuit below:



Solution:
This system can be represented by the complex matrix equation:

$$\begin{bmatrix} 10 + 200\cdot i & -200\cdot i \\ -200\cdot i & (200-30)\cdot i \end{bmatrix} \cdot \begin{bmatrix} I_1 \\ I_2 \end{bmatrix} = \begin{bmatrix} 5 \\ 0 \end{bmatrix}$$

$$\mathbf{[\,A\,]} \cdot \mathbf{[}\,I\,\mathbf{]} = \mathbf{[\,B\,]}$$

Then, lets enter the matrix “A” and “B”:

Keystrokes	Description
[A]	Select matrix A.
2 **[ENTER]** **[Dimension]**	Set de dimension of matrix “A” to 2 rows and 2 columns.
10 **[ENTER]** 200 **[f]** **[I]** **[STO]** Tap on row $\mathbf{A_{1,1}}$ **:**	Enter the complex number “10 + i·200” into matrix “A” element in row 1 and column 1.
0 **[ENTER]** 200 **[CHS]** **[f]** **[I]** **[STO]** Tap on row $\mathbf{A_{1,2}}$ **:**	Enter the complex number “-i·200” into matrix “A” element in row 1 and column 2.
[STO] Tap on row $\mathbf{A_{2,1}}$ **:**	Enter the complex number “-i·200” into matrix “A” element in row 2 and column 1.

Keystrokes	Description
0 **[ENTER]** 200 **[ENTER]** 30 **[-]** **[f]** **[I]** **[STO]** Tap on row $\mathbf{A_{2,2}}$ **:**	Enter the complex number "i·170" into matrix "A" element in row 2 and column 2.
Optionally, if you want to save the matrix for further use, tap the **[File ▶]** button and select the **"Save…"** option. Enter the Name for the matrix file and tap the **[Done]** button.	
[B]	Select matrix B.
2 **[ENTER]** 1 **[Dimension]**	Set de dimension of matrix "B" to 2 rows and 1 columns.
5 **[STO]** Tap on row $\mathbf{B_{1,1}}$ **:**	Enter the number "5" into matrix "B" element in row 1 and column 1.
0 **[STO]** Tap on row $\mathbf{B_{2,1}}$ **:**	Enter the number "0" into matrix "B" element in row 2 and column 1.

Now let's proceed to solve for **[I]** = **[B]** ÷ **[A]**

Keystrokes	Description
[f] **[RESULT]** **[C]**	Set matrix "C" to be the result matrix of the calculations to perform.
[RCL] **[B]**	Recalls the matrix "B" to calculator's stack.
[RCL] **[A]**	Recalls the matrix "A" to calculator's stack.
[÷]	Divide matrix "B" by matrix "A" and put the result in matrix "C".
[C]	Select matrix "C" to see the result: $\mathbf{I_1 = 0.0372 + i{\cdot}0.1311}$ $\mathbf{I_2 = 0.0437 + i{\cdot}0.1543}$