Adding a Calculator App to the SDRO1 App

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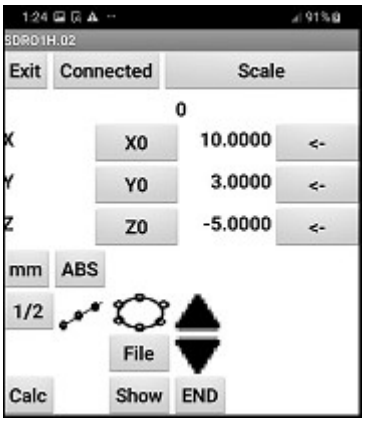
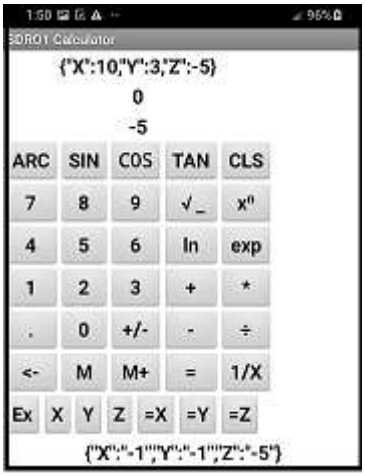
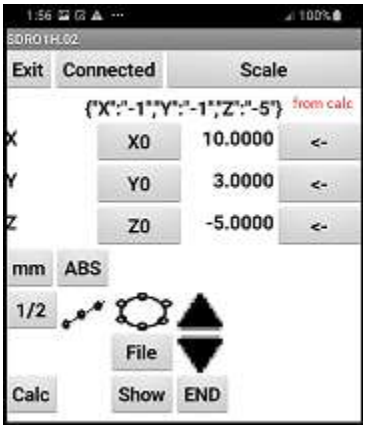


A screenshot of the SDRO1H_02 Android Application. A Calc. button has been added to the lower left. The Calc. button uses the Activity Starter component of App Inventor to launch a second application SDRO1calc_B.

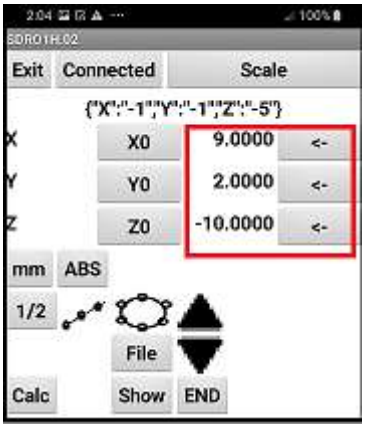
The calculator application screen. The data sent by the calling application is at the top and is annotated by the red text. Data to return to the calling application is at the bottom and is annotated in red. The X, Y, and Z buttons move input data into the accumulator. The =X, =Y, and =Z buttons move the accumulator to the output data.



-1 was entered into the accumulator and then copied to the x and Y outputs using the =X and +Y buttons. The Z button was used to copy the -5 Z input value to the accumulator and the =Z button copied the -5 value in the accumulator to the Z output. Press the Ex button to return to the calling application.



Having returned to SDRO1 the values returned by the calculator appear near the top of the display. A red annotation indicates the position. The <- buttons on the right of each axis will add the return value to the Offset portion of the display equation. Pressing each <- button once produces the following display.



X = 10 -1 = 9

Y = 3 -1 = 2

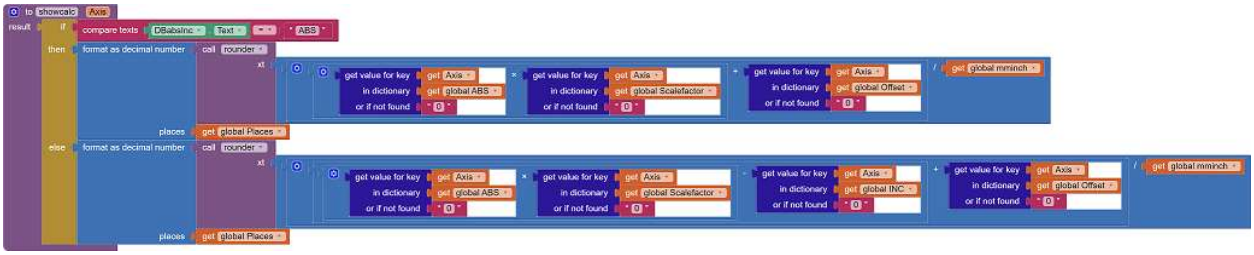
Z = -5 -5 = -10

The Display Equation

There are three equations one of each axis. Depending on the INC/ABS (Incremental/ Absolute) display mode they take the following forms:

Display = Offset + Incremental + Absolute. For Incremental and,

Display = Offset + Absolute. For Absolute mode.



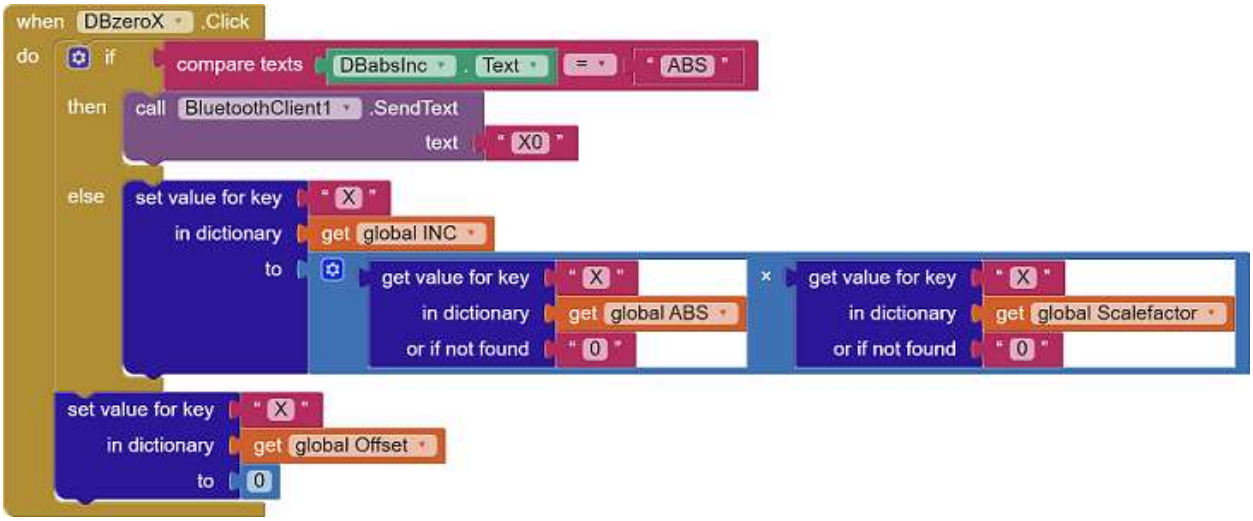
Program blocks used to calculate the display value.

Internally values are carried in mm.

Zeroing

The X0, Y0, and Z0 buttons depend on the ABS/INC button.

In ABS (Absolute) mode the zero buttons send a message to the Arduino hardware to zero the counter.



Zeroing the X axis.

The pattern END button zeros the offset and clears the pattern buffer.