Department of Engineering

EKG USER MANUAL

SUBJECT: Embedded Systems Design

ENGR 355

2021-2022

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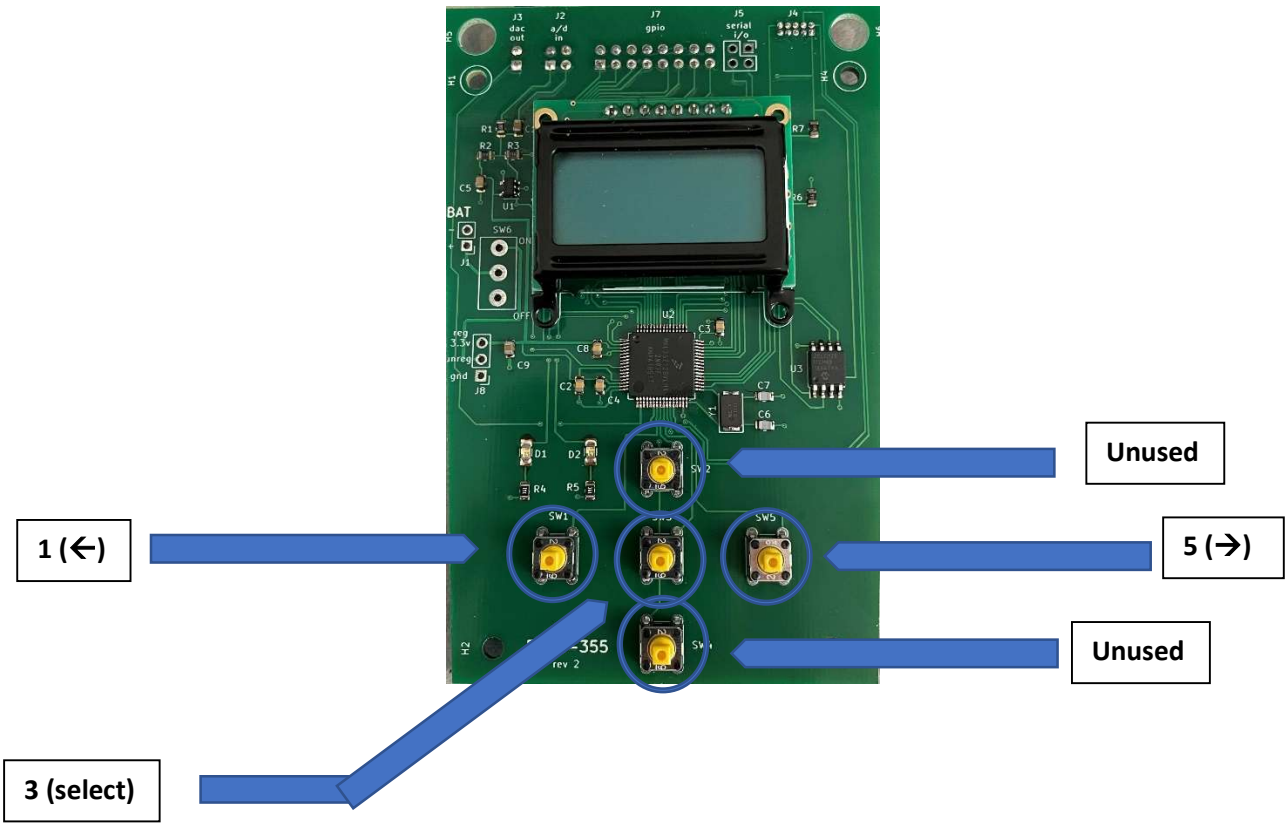
For: EKG User



Buttons

Three out of the five buttons are used for this device. The buttons are used to navigate through the device menu.

Button 1: Moves left through the menu

Button 2: Unused

Button 3: Used to select choices/enter modes/exit modes

(Press once to select mode. Press again to return to menu)

Button 4: Unused

Button 5: Moves right through the menu

Menu Navigation

The menu for this device consists of seven different modes: EKG Mode, Samp.ADC (STOR), Samp.ADC (FUTR), sampRate, set.Data, DAC.outp, and Download. The LCD start up in EKG mode, then allows the user to navigate through the other modes.

Startup

To power on the EKG, make sure the batteries have charge and flip the switch to "ON" (this hasn't been implemented yet, so the other way to power this is via USB cable).

EKG.MODE

- EKG.MODE is the default display for the EKG and outputs the BPM (beats per minute) of the input analog signal (machine or heart).
- The lower half of the screen will change as input varies. It will settle on its final value after a couple of seconds.
- There is no further selection for this mode.

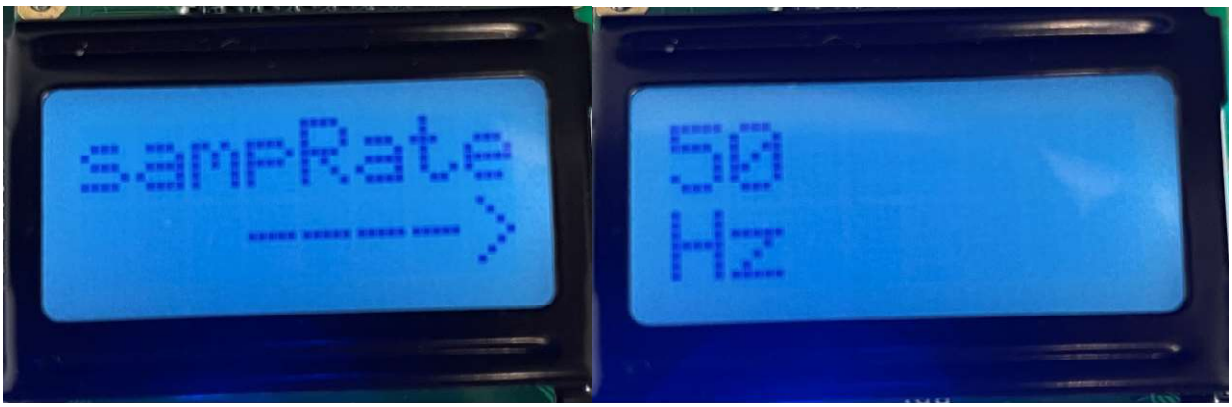
Samp.ADC (STOR)

- Samp.ADC (STOR) samples the analog input (at a previously set rate) and when the user presses the specified button (either button 2 or 4, but not yet determined) and stores the preceding number of data samples in RAM memory for use by the DAC.
- This mode has not been set up yet due to the fact that RAM memory has not been communicated with yet.
- There is no further selection for this mode.

Samp.ADC (Futr)

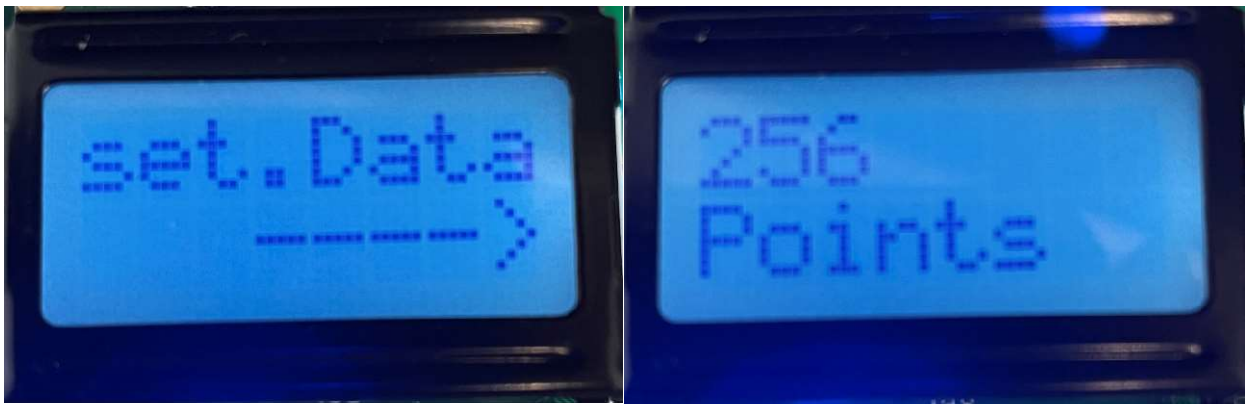
- Samp.ADC (Futr) has the same function as Samp.ADC (STOR) but instead of storing previously sampled points at the press of the button, it stores the point from the button press until the specified number of data points (selected in set.Data mode).
- This mode has not been set up yet due to the fact that RAM memory has not been communicated with yet.
- There is no further selection for this mode.

sampRate



- sampRate is a mode that is used to select the sample rate of the ADC. Rates available range from 50 to 1,000 samples per second (Hz).
- To enter this mode press the select button (3). Use buttons 1 and 5 to move left and right through the options. When desired option is reached, press the select button (3) one more time to return to the main menu and this will update the sample rate.

set.Data



- Set.Data is uset to set the number of data points in a waveform. Number of data points available are 128, 256 (default), 512, and 1024.
- To enter this mode press the select button (3). Use buttons 1 and 5 to move left and right through the options. When desired option is reached, press the select button (3) one more time to return to the main menu and this will update the number of data points in the waveform.
- This should be chosen before using the Samp.ADC modes or else it will just use the default 256 points.

DAC.outp

- DAC.outp mode creates an output waveform using data currently being input from the ADC (analog digital converter) or DAC memory (this is not used since memory has not been implemented yet).
- To display the waveform connect to a electronic test instrument (oscilloscope), press the select button while in DAC.outp mode.
- There is no further selection for this mode.

Download

*This mode is currently not in use