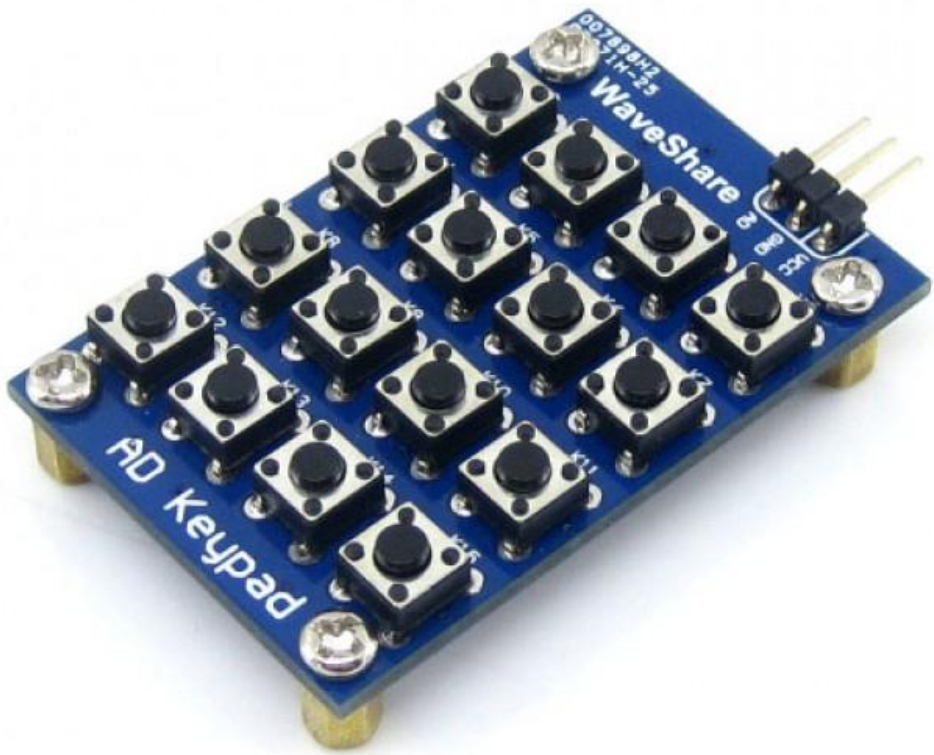
AD Keypad



Overview

The **AD Keypad** provides 16 push buttons, and takes up only 1 AD port for controlling. It's suitable for applications where the AD ports are sufficient yet I/O ports are lacking of.

Features

16 push buttons, detection interface

Parameters and How to

Parameters and Sampling

- **AD ideal value:** when button pressed, Viv = (button index / 16) x Vref
  AD real value: when button pressed, Vrv = (1 ± 6%) x Viv
  For instance, suppose Vref = 5, 8th button was pressed, then Viv = (8 / 16) x 5 = 2.5, Vrv = (1 ± 6%) x 2.5, equals to 2.35-2.65
- **Abbreviation**
  - Vref: AD reference voltage
  - iv: ideal value
  - rv: real value

	ADC Value Detection Range		Measurement Data (Vref=3.3V)			Measurement Data (Vref = 5V)		
Buttons	**10-bit ADC**	**8-bit ADC**	**Real Value Sampling (V)**	**Error (V)**	**Ideal Value (V)**	**Real Value Sampling (V)**	**Error (V)**	**Ideal Value(V)**
0	0-4	0-1	0	0	0	0	0	0
1	(1±6%)x64	(1±6%)x16	0.2054	-0.00085	0.20625	0.3112	-0.0013	0.3125
2	(1±6%)x128	(1±6%)x32	0.4117	-0.0008	0.4125	0.6238	-0.0012	0.625
3	(1±6%)x192	(1±6%)x48	0.6233	0.00455	0.61875	0.9444	0.0069	0.9375
4	(1±6%)x256	(1±6%)x64	0.8242	-0.0008	0.825	1.2487	-0.0013	1.25
5	(1±6%)x320	(1±6%)x80	1.0304	-0.00085	1.03125	1.5612	-0.0013	1.5625
6	(1±6%)x384	(1±6%)x96	1.2355	-0.002	1.2375	1.8719	-0.0031	1.875
7	(1±6%)x448	(1±6%)x112	1.4448	0.00105	1.44375	2.189	0.0015	2.1875
8	(1±6%)x512	(1±6%)x128	1.6541	0.0041	1.65	2.5061	0.0061	2.5
9	(1±6%)x576	(1±6%)x144	1.8637	0.00745	1.85625	2.8237	0.0112	2.8125
10	(1±6%)x640	(1±6%)x160	2.0732	0.0107	2.0625	3.1411	0.0161	3.125
11	(1±6%)x704	(1±6%)x176	2.2672	-0.00155	2.26875	3.435	-0.0025	3.4375

12	(1±6%)x768	(1±6%)x192	2.4712	-0.0038	2.475	3.7441	-0.0059	3.75
13	(1±6%)x832	(1±6%)x208	2.6789	-0.00235	2.68125	4.0588	-0.0037	4.0625
14	(1±6%)x896	(1±6%)x224	2.8902	0.0027	2.8875	4.3789	0.0039	4.375
15	(1±6%)x960	(1±6%)x240	3.1092	0.01545	3.09375	4.7107	0.0232	4.6875

How to detect and handle in your code

For 10-bit ADC, the 8th button generates ADC value between (1±6%)x512, the equivalence of "481-543". If the ADC value had been detected to be "510-518" in the code, the 8th button's supposed to have been pressed.

For 8-bit ADC, the 8th button generates ADC value between (1±6%)x128, the equivalence of "120-136". If the ADC value had been detected to be "124-128" in the code, the 8th button's supposed to have been pressed.

Downloads

Development resources: demo codes, schematic, datasheets, etc.
Wiki: www.waveshare.com/wiki/AD_Keypad