

Overview

The chipKIT KYPD library is a programming interface for a matrix keypad. This document provides an overview of the library and describes the functions in the programming interface.

The targeted keypad is a matrix in which each row of keys corresponds to a row pin, and each column of keys corresponds to a column pin. Thus, four row pins and four column pins can address the keys pushed. To read a key's state, the column pin for that key must be pulled low to enable all of the keys in that column. When you push a key in that column, the corresponding row pin reads logic low. All of the keys can be read by walking a logic 0 through each column pin (while keeping the other pins at logic high) and reading the row pins. This reads the state of each key.

Library Operation

Library Interface

The header file KYPD.h declares the programming interfaces to the matrix keypad. In this file, the number of rows and the number of columns are defined as the constants KYPD_ROWNUM and KYPD_COLNUM. You can change these constants to target matrix keypads of different sizes.

The library is accessed via the methods and constants defined for the KYPD object class. To use a KYPD object, simply include the library and instantiate a KYPD object (e.g., myKYPD, or whatever name you want).

KYPD Initialization

Function `setPins()` is used to define the row and column pins of the matrix keypad. Function `setKeyMap()` is used to define the return value when the key is pressed. These functions should be called before calling `begin()`. Before making calls to any other library functions, `begin()` must be called in order to set the direction of the pins. To release the pins that were used by the KYPD, simply call `end()`.

KYPD Library Functions

Initialization Functions

void begin(void)

Parameters:
None

Sets column pins for output and row pins for input.

void end(void)

Parameters:
None

This function releases all pins.

void setPins(unsigned int* row, unsigned int* col)

Parameters:
row pointer to an array of pins to be row
col pointer to an array of pins to be col

Sets the pins for the row and column.

void setKeyMap(int table[KYPD_COLNUM][KYPD_ROWNUM])

Parameters:
table pointer to an 2D array for key mapping

Maps the table into the key map.

Procedure Functions

int getColRow(void)

Parameters:

None

Return Value:

int column-row indicator

The most significant 16-bit is the column and the least significant 16-bit is the row. Returns -1 if no keys were pressed.

Returns the column-row indicator by driving each column low one at a time and checking the output of the row pins.

int getKey(int colRow)

Parameters:

colRow 32-bit column-row indicator

The most significant 16-bit is column and the least significant 16-bit is row.

Return Value:

int key pressed

Returns the corresponding value in the key map of the 32-bit column-row indicator.

int getKey(void)

Parameters:

None

Return Value:

int key pressed, returns -1 if no key was pressed

This function returns the corresponding value in the key map by driving each column low one at a time and checking the output of the row pins.