## INSTALLATION

1) Put `k8055seq.exe` in a directory of your choice. Any directory is fine.

2) Plug the K8055 card into a USB port and make sure that Windows has recognized it. Output 8 LED should blink a few times, and then go off. If Output 8 LED is stays lit, Windows has not recognized your card and you need to resolve this problem before continuing. **Important:** the K8055 must be plugged in and recognized by Windows *before* you run this software! If more than one K8055 is connected to your system, this software will use the card with the lowest address set on its jumpers.

3) Launch **k8055seq.exe** from Windows Explorer.

SEQUENCER Tab
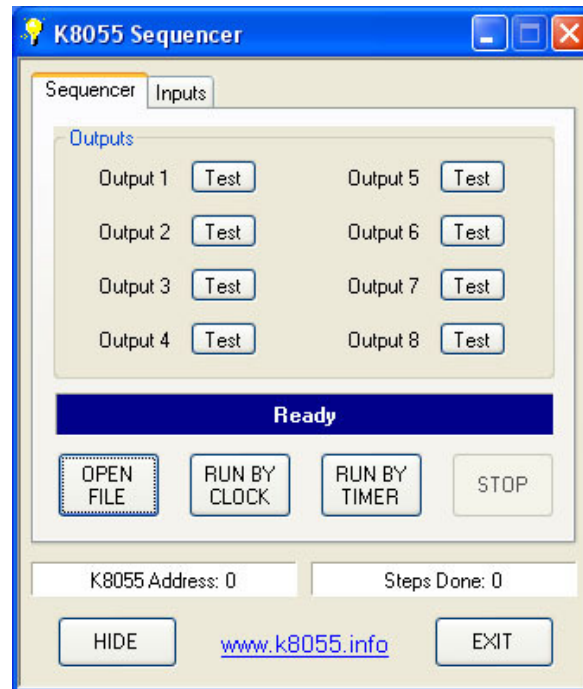
|	
Output Labels:	Turn green when the corresponding digital output is On.
Test Buttons:	Clicking a Test Button turns the corresponding digital output On for as long as the button is held.
Open File:	Click to select the textfile containing the sequencer program you want to run (see Programming section below).
Run by Clock:	Runs the selected sequencer program. All times in the program are interpreted as **times of day** (the time on your computer clock). For example, a step in the program with a time of "00:02:30" would execute at 2 minutes 30 seconds after midnight, regardless of when you actually clicked Run by Clock. When running by Clock, the program runs forever, until you click the Stop button. This is useful for things like Christmas Lights or home automation projects (any application where you want things to happen at the same time every day, day after day).
Run by Timer:	Runs the selected sequencer program. All times in the program are interpreted as **time offsets**, using an internal timer that starts at 00:00:00 when you click the Run by Timer button. For example, a step in the program with a time of "00:02:30" would execute 2 minutes 30 seconds after you clicked Run by Timer. When running by Timer, the program executes each step once and then stops.
Stop:	Stops the running sequencer program and turns all outputs Off.

CAUTION: Regardless of whether you are using Clock mode or Timer mode, changing or otherwise messing with the computer clock while a sequencer program is running can produce unexpected operation. Clock changes will not crash the program, but they may cause it to do something other than what you wanted. You have been warned.

INPUTS Tab
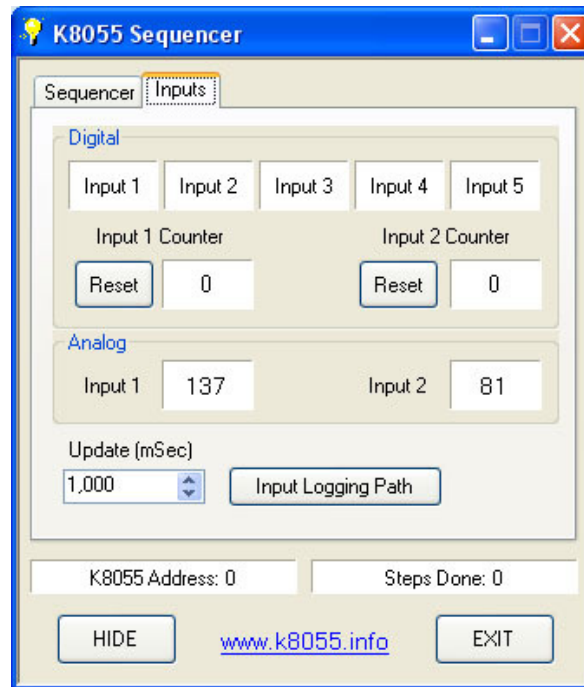
The controls on this tab have nothing to do with Sequencer operation. They are just an "extra" in case you want to use your K8055 inputs for something. If all you need to do is sequence outputs you can ignore this tab completely.

Input Labels: Turn green when the corresponding digital input is On.

Reset Buttons: Pressing a Reset button resets the corresponding onboard counter to 0.

Analog Inputs: Displays the values (0 – 255) of Analog Inputs 1 & 2, as read from the card.

Update (mSec):   The interval, in milliseconds, that the K8055's digital and analog inputs, and the card's onboard counters, are read from the card and updated on the screen. Every time the inputs are updated their values are also written out to a text file for use by PHP, ASP or other page generation code. Setting this interval unnecessarily low can result in increased CPU usage and poor performance.

Log Path: Lets you select the folder that the aforementioned text file is stored in. (default is C:\)

PROGRAMMING

Sequencer programs are simply text files. Create them with any text editor (e.g. Notepad) and save them with a **.txt** extension. Alternately you could create them with Excel, save as .csv, and then change the extension to .txt. Note that saving directly as a textfile from Excel produces tab separated (not comma separated) data, so doing that is probably not a good idea.

In theory there is no maximum length limit for a sequencer program. In practice, the speed of your machine will determine what is "too long". If a program is too long for your machine you will experience problems such as skipped program steps. Testing has shown that programs with several thousand steps work fine on any reasonably modern system.

Each line in the textfile should contain one complete command.

General command format is:

```
hh:mm:ss, CMDx [, onTime] [, offTime]
```

`hh:mm:ss`	is the time when the command will execute. 24 hour clock format (e.g. 16:20:00 means 4:20pm).
`CMD`	is one of the 4 commands: ON, OFF, BL, PU.
`x`	is the number (1 – 8) of the output the command will operate on.
`onTime`	is the time (in milliseconds) the output will stay on – used in BL and PU commands only.
`offTime`	is the time (in milliseconds) the output will stay off – used in BL command only.

ON Command
Turns the specified output On. Output remains On until another command turns it Off.
Example: `09:14:00, ON2`   turns output 2 On at 9:14am (running by Clock) or 9 hours 14 minutes after starting the program (running by Timer).

OFF Command
Turns the specified output Off. Output remains Off until another command turns it On.
Example: `13:10:00, OFF7`   turns output 7 Off at 1:10pm (running by Clock) or 13 hours 10 minutes after starting the program (running by Timer).

BL Command
Blinks the specified output. Output continues to blink until another command turns it Off or On. The BL command requires onTime and offTime to be specified in milliseconds.
Example: `01:11:00, BL3, 1000, 500`   At 1:11am (running by Clock) or 1 hour 11 minutes after starting the program (running by Timer), output 3 starts blinking. It blinks On for 1 second, Off for 0.5 second, On for 1 second, …

PU Command
Pulses the specified output On once. The PU command requires onTime to be specified in milliseconds.
Example: `01:11:00, PU5, 400`   At 1:11am (running by Clock) or 1 hour 11 minutes after starting the program (running by Timer), output 5 comes On for 0.4 second and then goes Off.

General

Largest valid execution time (`hh:mm:ss`), regardless of whether running by Clock or Timer, is 23:59:59.

More than 1 command can have the same execution time. There is no limit, but why would you need more than 8 commands to run at the same time? There are only 8 outputs!

Smallest valid time for onTime and offTime in BL and PU commands is 100mSec. Smaller times will not cause an error, but they will be adjusted up to 100 at runtime.

Blank lines in the sequencer program are okay. Comments are not okay.

Commas are required. Spaces are not required but they make the program easier to look at.

Leading zeroes on times are not required (e.g. 04:20:00 and 4:20:00 both work) but they make the program easier to look at.

SAMPLE PROGRAM

```
00:01:00, ON1
00:01:00, ON2
00:01:00, ON3
00:05:10, PU8, 500
00:05:15, BL7, 1000, 2000
00:10:15, OFF7
00:10:15, ON6
00:11:00, PU7, 250
01:00:00, OFF1
01:00:00, OFF2
01:00:00, OFF3
01:00:00, OFF6
```

If **Running by Clock**, this program would do the following:

At 1 minute past midnight, outputs 1, 2 and 3 turn On.
At 5 minutes 10 seconds past midnight, output 8 turns On for 0.5 seconds and then turns back Off.
At 5 minutes 15 seconds past midnight, output 7 starts blinking: 1 second On, 2 seconds Off, …
At 10 minutes 15 seconds past midnight, output 7 turns Off and output 6 turns On.
At 11 minutes past midnight, output 7 turns On for 0.25 seconds and then turns back Off.
At 1:00am, outputs 1, 2, 3, and 6 all turn Off.

If you leave the program running, all of this will happen again the next night (and the next, forever).

If **Running by Timer**, this program would do the following:

1 minute after Run by Timer is clicked, outputs 1, 2 and 3 turn On.
4 minutes 10 seconds later, output 8 turns On for 0.5 seconds and then turns back Off.
5 seconds after that, output 7 starts blinking: 1 second On, 2 seconds Off, …
5 minutes after that, output 7 turns Off and output 6 turns On.
45 seconds after that, output 7 turns On for 0.25 seconds and then turns back Off.
49 minutes later, outputs 1, 2, 3, and 6 all turn Off.

After the last step the program stops. Click Run by Timer to run it again.

Visit http://www.k8055.info for more information and FREE K8055 software.