Disclosure

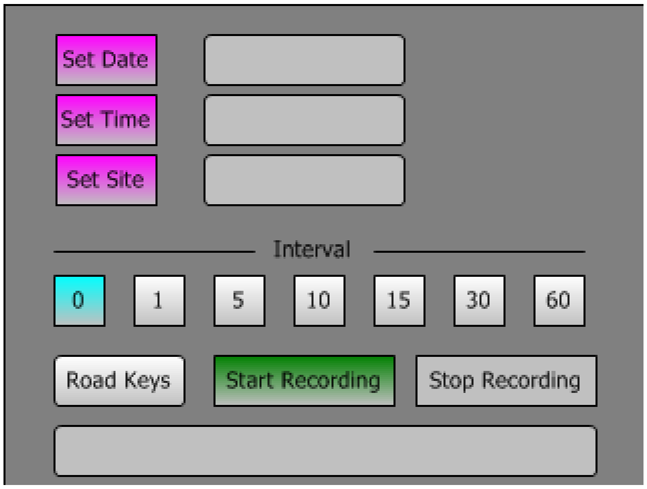
Traffic lights are expensive to install at intersections. Some justification is needed in order to proceed with this expenditure. Each year dozens of students are hired in cities across Canada to perform traffic surveys at street intersections and the data is analyzed according to a standard formula. The resulting yes/no answer can trigger costly installation for the city and profitable sales for traffic light companies.

In order to make this survey process standard and accurate, automated recording equipment is used. The data is recorded in the field and brought back to the office to be fed into a program which generates the reports. Several companies have been manufacturing this type of data logger for years. This application implements such a recording device using a MikroElektronika board for Stelaris© M3. The code is written in MicroC for ARM with an assist from Visual TFT.

Several example projects have been combined into a single application in this design as a test to prove feasibility. The resulting device suffers from having a touchscreen that is too small and therefore no commercial value is expected. Also, no attempt has been made to minimize the current consumption which is considerable for such a device. A commercial device would expect a week of usage before recharging is required. Furthermore, the MikroE board lacks a 32.768 kHz crystal to keep the time-of-day clock alive when main power is turned off forcing the user to re-enter the date and time each time.

Therefore, I have submitted this project freely in the hope that someone may find the example code useful and modify it for their use.

Screen Shots

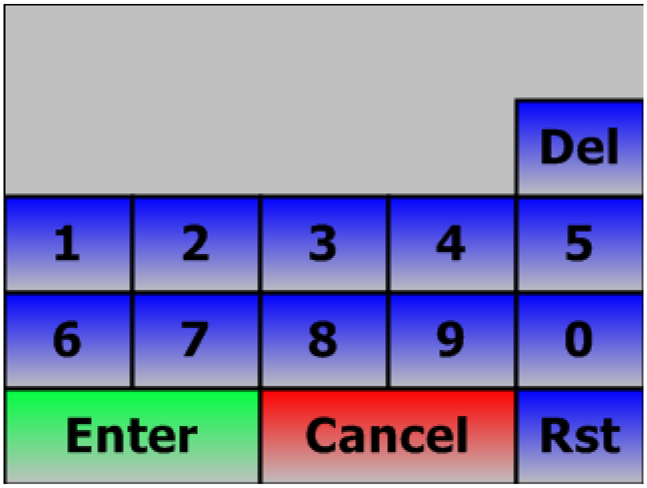


This screen provides for entry of the parameters. The date is set as follows: YYYY/MM/DD. The time is in the following format: HH:MM:SS. The site is a 10-digit number identifying the intersection where the survey was taken.

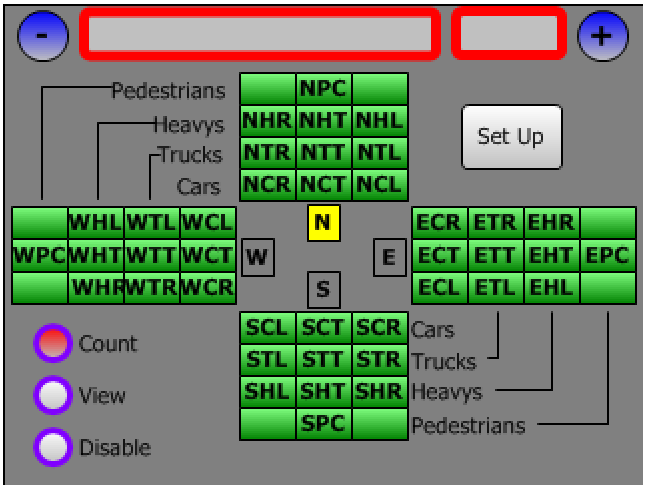
The interval setting determines when the counters will be saved to the Flash card. The 0 interval means that there is no interval and the counters will never be recorded. The 1 minute interval records every time the seconds of the clock roll over to 00. The other interval settings record the counters on their respective time boundaries.

When the Start Recording button is pressed, a file is opened and a header with the parameter data is written to the file. Each interval thereafter, all of the counter values are saved to the file and the internal counter variables are reset to 0. When the Stop Recording button is pressed, one last storing of counters is performed so that any partial interval counts are recorded.

The file name used is YYYYMMDD.TXT. If a survey is stopped and then re-started, the data is appended to the file with a new header.



This is the entry screen for the date, time, and site. A minimum amount of checking is performed on the data. This should be enhanced for a more robust application.



● Count
○ View
○ Disable

This is the main entry screen. Each compass direction has buttons associated with Cars, Trucks, and Heavy trucks. Each vehicle goes Through an intersection or turns Right or Left. Pedestrians usually Cross an intersection. The keyboard can be rotated depending on which direction the survey taker is facing. Sometimes a road is a “T” intersection. The Disable radio button is used to make some keys invalid.

The following short form nomenclature is used for the keys:

NPC – North Pedestrian Cross

NHR – North Heavy Right

NHT – North Heavy Through

NHL – North Heavy Left

NTR – North Truck Right

NTT – North Truck Through

NTL – North Truck Left

NCR – North Car Right

NCT – North Car Through

NCL – North Car Left

SCL – South Car Left

SCT – South Car Through

SCR – South Car Right

STL – South Truck Left

STT – South Truck Through

STR – South Truck Right

SHL – South Heavy Left

SHT – South Heavy Through

SHR – South Heavy Right

SPC – South Pedestrian Cross

WHL – West Heavy Left

WTL – West Truck Left

WCL – West Car Left

WPC – West Pedestrian Cross

WHT – West Heavy Through

WTT – West Truck Through

WCT – West Car Through

WHR – West Heavy Right

WTR – West Truck Right

WCR – West Car Right

ECR – East Car Right

ETR – East Truck Right

EHR – East Heavy Right

ECT – East Car Through

ETT – East Truck Through

EHT – East Heavy Through

EPC – East Pedestrian Cross

ECL – East Car Left

ETL – East Truck Left

EHL – East Heavy Left

Data

Recorded data on the Flash card can be read on a PC. Alternatively, the data can be downloaded through the USB port. This part of the code is missing as well as the PC application that receives the data. In addition, an application is needed on the PC to analyze the data.

The USB port can also be used similarly to a serial COM port. Commands are sent from the PC and the MikroE board responds to those commands. The C# code uses a dll from

http://www.USBHIDNetClass.org

and will disable after 30 minutes without a valid license.