A PharoThings Tutorial

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January 8, 2019

Layout and typography based on the `sbabook` LaTeX class by Damien Pollet.

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CHAPTER 1

Lesson 10 - LCD Display

In the previous lessons, we learned how to control LEDs and to use a button to interact with LEDs. We learned also how to use the I2C sensors to read the temperature, humidity, pressure, and x, y, z-axis. Also, we saw how to use a no I2C sensor, an ultrasonic sensor. Now we will learn how to use an LCD Display without I2C.

1.1 What do we need?

In this lesson, we will use a setup with an LCD Display 1602.

Components

- 1 Raspberry Pi connected to your network (wired or wireless)
- 1 Breadboard
- 1 LCD Display 1602
- 1 Potentiometer (10K ohms)
- Jumper wires

1.2 Experimental theory

Before constructing any circuit, you must know the parameters of the components in the circuit, such as their operating voltage, operating circuit, etc.

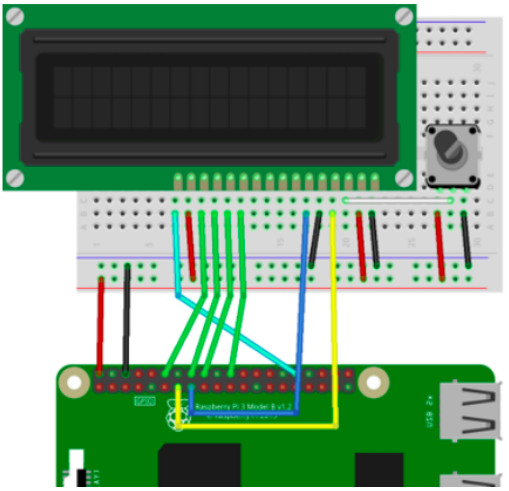

Figure 1-1 Physical sensors connection.

The LCD Display 1602

How the LCD 1602 works?

1.3 Experimental procedure

Now we will build the circuit. This circuit consists of three sensors and a power supply (the Rasp).

- Connect the Ground PIN from Raspberry in the breadboard blue rail (-). In this experiment we will use the PIN6 (Ground);
- Then connect the 5V (PIN2) pin in the red rail (+).
- Now push the LCD 1602 in the breadboard;
- Push the potentiometer in the breadboard;
- And insert the jumper wires connecting the LCD Display in the Potentiometer and breadboard, as the scheme shown in the Figure 1-1.

The Figure 1-1 shows how the electric connection is made.

1.4 Connecting remotely

Through your local Pharo image, let's connect in the Pharo image by running on Raspberry, enable the auto-refresh feature of the inspector, and open the inspector. Run this code in your local playground:

```
remotePharo := TlpRemoteIDE connectTo: (TCPAddress ip: #[193 51 236
    212] port: 40423)
GTInspector enableStepRefresh.
remoteBoard := remotePharo evaluate: [ RpiBoard3B current].
remoteBoard inspect.
```

1.5 Experimental code

In your inspect window (Inspector on a PotRemoteBoard), let's create the instances of the LCD Display.

```
lcd := board installDevice: PotLCD1602Device new.
```

As we saw before, we can inspect the remote object to see some properties and methods. Let's use the method `message:` to send some message to LCD Display. To break line you can use "/n". And to clear the LCD you can use the method `clear`:

```
lcd message: 'Hello everybody!\Pharo is cool!'.
lcd clear.
```