Notes

The KA02 Audio Shield is mounted on top of the UNO R3. Connections are made to the feed through sockets on the KA02.

Resistor values were determined during testing of the Ring Sensor.

R1 and R9 differ in value from the others probably because LDR1 and LDR9 are of a different type. It was easier to adjust the resistor values than dismantle the ring sensor!
SOAP - Sensor Overview

Support Board (non-copper strip side)

'Hinge' Connections

Ring Board (Copper strip side)
SOAP - Sensor Ring Board

LEGEND

- Signal Wire
- 0V Wire
- Wire for mechanical strength
- Break in copper strip
- Light Dependent Resistor

All components and wires installed on non-copper strip face.

SOAP
(Speech Output Announcing Programmes)
Talking Washing Machine Interface for the Blind.

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SOAP - Sensor Support Board

LEGEND

- Signal Wire
- 0V Wire
- Wire for mechanical strength
- Break in copper strip
- 16 Way Right Angle PCB Header

All components and wires installed on non-copper strip face except 'hinge' connections.

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SOAP - Simulation & Test Board

Test Pin Number =
Wash Programme Number

0V

46

86

LEGEND

<table>
<thead>
<tr>
<th>Color</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blue</td>
<td>Signal Wire</td>
</tr>
<tr>
<td>Green</td>
<td>0V Wire</td>
</tr>
<tr>
<td>Red</td>
<td>5V Wire</td>
</tr>
<tr>
<td>Pink</td>
<td>Break in copper strip</td>
</tr>
<tr>
<td>Light Green</td>
<td>16 Way 2 Row PCB Header</td>
</tr>
<tr>
<td>Dark</td>
<td>14 Way Male Header Pin Strip</td>
</tr>
<tr>
<td>Black</td>
<td>0V Pin</td>
</tr>
</tbody>
</table>

All components and wires installed on non-copper strip face.

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SOAP - Testing Ring Sensor

Measured Resistances were used to select series resistor values.

UNO Input voltage must be more than 3V when the wash programme LED is off (LDR in darkness) and less than 3V when the LED is on (Illuminating the LDR).

<table>
<thead>
<tr>
<th>Pin</th>
<th>Wash Programme</th>
<th>On (kΩ)</th>
<th>Off (kΩ)</th>
<th>Series Resistor (kΩ)</th>
<th>Volts on</th>
<th>Volts off</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>COTTON</td>
<td>300</td>
<td>6000</td>
<td>470</td>
<td>1.9</td>
<td>4.6</td>
</tr>
<tr>
<td>2</td>
<td>ECO COTTON</td>
<td>42</td>
<td>500</td>
<td>100</td>
<td>1.5</td>
<td>4.2</td>
</tr>
<tr>
<td>3</td>
<td>SYNTHETICS</td>
<td>46</td>
<td>700</td>
<td>100</td>
<td>1.6</td>
<td>4.4</td>
</tr>
<tr>
<td>4</td>
<td>WOOL</td>
<td>90</td>
<td>2500</td>
<td>100</td>
<td>2.4</td>
<td>4.8</td>
</tr>
<tr>
<td>5</td>
<td>SPIN</td>
<td>70</td>
<td>1600</td>
<td>100</td>
<td>2.1</td>
<td>4.7</td>
</tr>
<tr>
<td>6</td>
<td>RINSE+SPIN</td>
<td>63</td>
<td>3800</td>
<td>100</td>
<td>1.9</td>
<td>4.9</td>
</tr>
<tr>
<td>7</td>
<td>ECO DRUM CLEAN</td>
<td>60</td>
<td>4000</td>
<td>100</td>
<td>1.9</td>
<td>4.9</td>
</tr>
<tr>
<td>8</td>
<td>SUPER ECO WASH</td>
<td>65</td>
<td>500</td>
<td>100</td>
<td>2.0</td>
<td>4.2</td>
</tr>
<tr>
<td>9</td>
<td>15 M QUICK WASH</td>
<td>102</td>
<td>1800</td>
<td>470</td>
<td>0.9</td>
<td>4.0</td>
</tr>
<tr>
<td>10</td>
<td>DAILY WASH</td>
<td>55</td>
<td>400</td>
<td>100</td>
<td>1.8</td>
<td>4.0</td>
</tr>
<tr>
<td>11</td>
<td>DELICATES</td>
<td>86</td>
<td>260</td>
<td>100</td>
<td>2.3</td>
<td>3.6</td>
</tr>
<tr>
<td>12</td>
<td>DARK GARMENT</td>
<td>44</td>
<td>250</td>
<td>100</td>
<td>1.5</td>
<td>3.6</td>
</tr>
<tr>
<td>13</td>
<td>BEDDING</td>
<td>55</td>
<td>250</td>
<td>100</td>
<td>1.8</td>
<td>3.6</td>
</tr>
<tr>
<td>14</td>
<td>BABY CARE</td>
<td>62</td>
<td>400</td>
<td>100</td>
<td>1.9</td>
<td>4.0</td>
</tr>
</tbody>
</table>

SOAP
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Talking Washing Machine Interface for the Blind

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**SOAP - Interface Board**

Pin Number = Wash Programme Number = Resistor Number

<table>
<thead>
<tr>
<th>Pin</th>
<th>Wash Programme</th>
<th>Series Resistor (kΩ)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>COTTON</td>
<td>R1</td>
</tr>
<tr>
<td>2</td>
<td>ECO COTTON</td>
<td>R2</td>
</tr>
<tr>
<td>3</td>
<td>SYNTHETICS</td>
<td>R3</td>
</tr>
<tr>
<td>4</td>
<td>WOOL</td>
<td>R4</td>
</tr>
<tr>
<td>5</td>
<td>SPIN</td>
<td>R5</td>
</tr>
<tr>
<td>6</td>
<td>RINSE+SPIN</td>
<td>R6</td>
</tr>
<tr>
<td>7</td>
<td>ECO DRUM CLEAN</td>
<td>R7</td>
</tr>
<tr>
<td>8</td>
<td>SUPER ECO WASH</td>
<td>R8</td>
</tr>
<tr>
<td>9</td>
<td>15 M QUICK WASH</td>
<td>R9</td>
</tr>
<tr>
<td>10</td>
<td>DAILY WASH</td>
<td>R10</td>
</tr>
<tr>
<td>11</td>
<td>DELICATES</td>
<td>R11</td>
</tr>
<tr>
<td>12</td>
<td>DARK GARMENT</td>
<td>R12</td>
</tr>
<tr>
<td>13</td>
<td>BEDDING</td>
<td>R13</td>
</tr>
<tr>
<td>14</td>
<td>BABY CARE</td>
<td>R14</td>
</tr>
</tbody>
</table>

**Notes**
Resistor values were determined during testing of the Ring Sensor.

R1 and R9 differ in value from the others probably because LDR1 and LDR9 are of a different type. It was easier to adjust the resistor values than dismantle the ring sensor!

**LEGEND**
- Signal Wire
- 0V Wire
- 5V Wire
- Break in copper strip
- 16 Way 2 Row PCB Header
- 17 Way Male Header Pin Strip
- Resistor (#=Wash Programme)

All components and wires installed on non-copper strip face.

**SOAP**
(Speech Output Announcing Programmes)

Talking Washing Machine Interface for the Blind

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SOAP - Velleman KA02 Audio Shield

Speaker Connections

Volume →
Feed Through →
Play →
Record →
Erase →
Forward →
Reset →

→ Line-Out
→ Microphone
→ Line-In

SOAP
(Speech Output Announcing Programmes)
Talking Washing Machine Interface for the Blind

www.instructables.com/member/Wingletang/
SOAP - Interface Board to Uno R3

Resistor numbers = Wash programme numbers

R1 & R9: 470kΩ
All others: 100kΩ

Note: Dupont wires actually connected to feedthrough sockets on KA02 Audio Shield

Signal Wire
0V Wire
5V Wire
Break in copper strip

16 Way 2 Row PCB Header
17 Way Male Header Pin Strip Resistor (#=Wash Programme)

SOAP
(Speech Output Announcing Programmes)

Talking Washing Machine Interface for the Blind

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SOAP - Testing The Chatterbox

Connecting a test pin to 0V should cause the related audio clip to be played.

Pin Number = Wash Programme Number

0V Pin

Test Board

Ribbon Cable

Assembled Chatterbox including interface board with selected series resistors

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