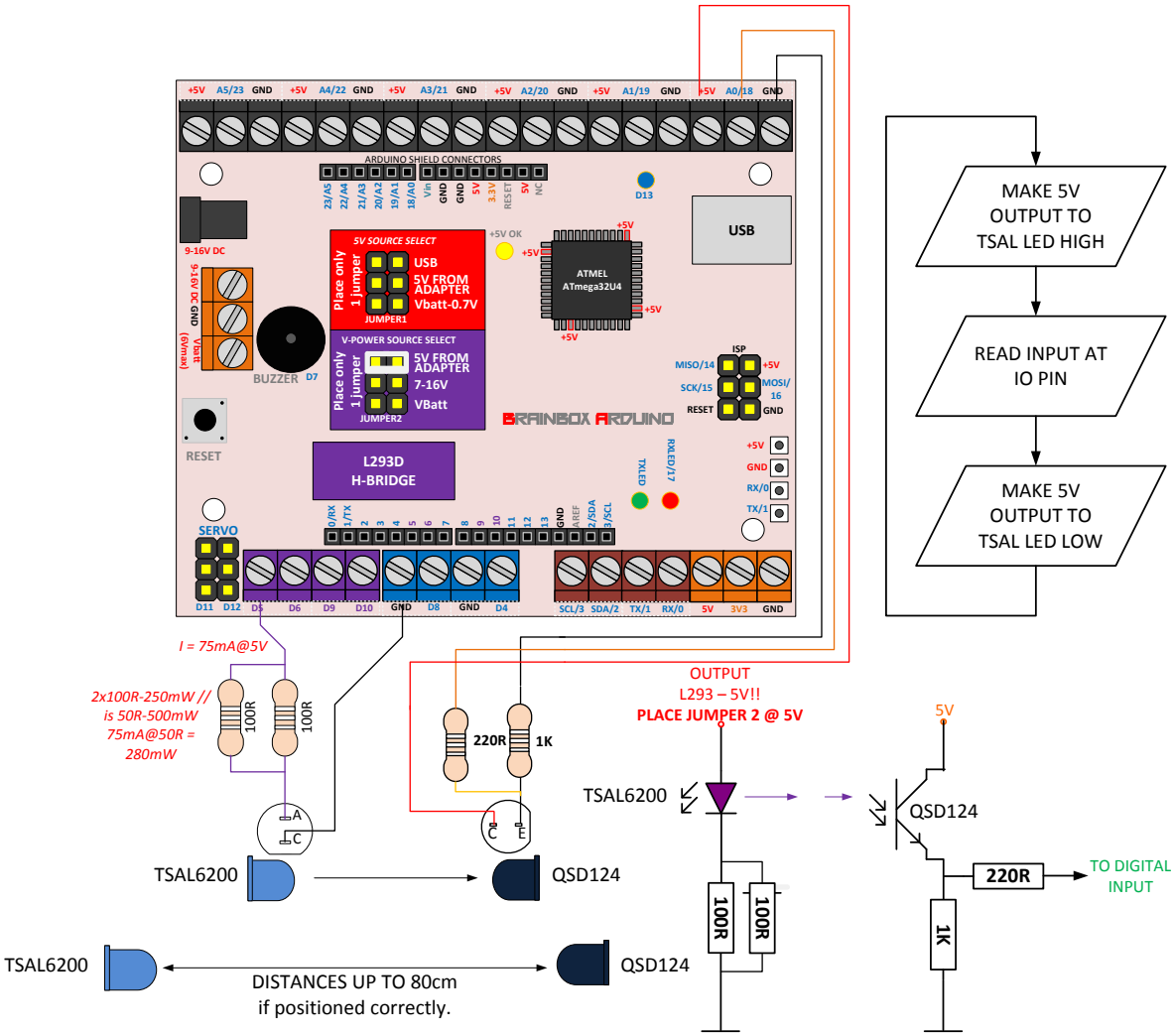
I-DIG LIGHTBEAM DETECTOR

Required knowledge Led, infrared light, Phototransistor

JUST Google It!	**Photo Transistor – Infrared light – led – infrared led – IR LED – IR** **Phototransistor - Ohms Law – Voltage divider** **TSAL6200 datasheet – QSD124 datasheet**



This sensor operates with a transmitter and a receiver. When an object breaks the light beam, this can be measured by our microcontroller.

Components:

IR Emitter TSAL6200 (alt for TSAL5100)	Farnell: 3152856
IR Photo Transistor QSD124 (alt for BPV11F)	Farnell: 2453253
4 resistors – 250mW	100R, 100R, 1K, 220R

Industrial distance sensors are expensive. We can build this one for less than 0.5€. This sensor is tested for distances up to 80cm, but larger distances are possible if you send more current trough the TSAL6200 (up to 100mA).

Transmitter: TSAL6200 IR emitter from Vishay.

We choose for IR light because this is not disturbed by other light sources. (Be aware that sunlight does also contain IR light and that sunlight can disturb the measurement) This TSAL6200 needs about 75mA to operate properly, so we will use one of the 4 600mA outputs (D5,D6,D9,D10) at 5Volt to provide this current. Make sure that the jumper of 'VPOWER SOURCE SELECT' is placed in the 5V position and that the adapter is connected. The 600mA outputs will not operate at USB power.

Receiver sensor: QSD124

This sensor has an extra dark filter that only lets the IR signals trough to the Phototransistor. If the IR light beam reaches this receiver, the QSD124 will be in saturation and the uC will read a high signal. When an object prevents the beam from reaching this receiver, the transistor will not saturate and the uC will read a high signal at its input pin.

QSD124 detects IR light -> Transistor in saturation -> Voltage over R(1K) maximal -> digital input = high

Activate TSAL6200

CODE EXAMPLE: '**O-500**'

Read analog input from QSD124

CODE EXAMPLE: '**I-DIG**'