



Vandpumpe 3 V – 4,5 V er perfekt til at skabe dit eget selvvandende drivhus eller vandfontæne-projekt.

Nødvendigt tilbehør

Enkel vandfontæne:

- 663039 Vandpumpe
- 038530 Siliconeslange, Ø6/8 mm
- 414520 Knivafbryder, mini, enkel
- 641320 Klemrække
- 350555 Batteri 4,5 V/ 355035 Netadapter universel
- 641940/641941 ekstra ledning

Opret dit eget enkle vandfontæne ved at tilslutte vandpumpen direkte til en 3 til 4,5 V strømkilde. Vi anbefaler et 4,5 V batteri eller den Netadapter universel (355035) Brug et ledningsstik til at forlænge ledningerne på w-skærmen for at maksimere ater pumpen (lodning af de små ledninger kan være vanskelig), så strømforsyningen kan tilsluttes væk fra vandet. Tilføj en Knivafbryder i kredsløbet. Pumpen fungerer med fuld kapacitet, så længe kontakten er tændt. Hvis du er interesseret i at regulere pumpens hastighed, se instruktionerne til det selvvandende drivhus nedenfor.

Selvvandende drivhus

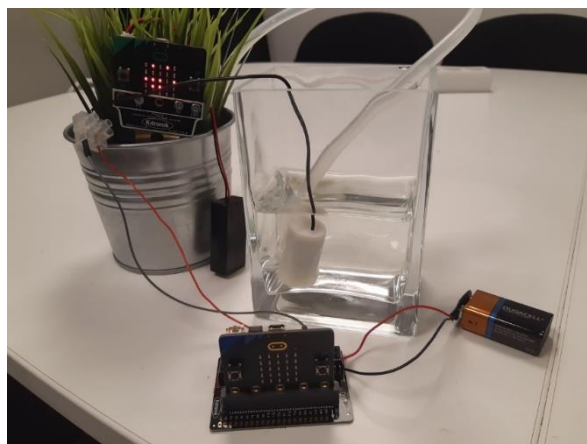
- 663039 vandpumpe
- 038530 Siliconeslange, Ø6/8 mm
- 663013 Motorstyring til micro:bit

- 641320 Klemrække
- 663002/663020 micro:bit
- 663024 Jord-Fugtighedssensor
- 641940/641941 ekstra ledning

I dit selvvandende drivhus vil du være i stand til at bestemme fugtigheden i drivhuset / planten ved hjælp af en jordfugtighedssonde. Du skal bruge mikrobitten til at aflæse sondens værdi for at afgøre, om du skal tænde vandpumpen. Motorstyringen er nødvendig, da dens udgange er designet til at levere tilstrækkelig strøm til at drive vandpumpen. Du kan blive fristet til at tilslutte vandpumpen direkte til P0, P1 eller P2 på micro:bit'en, da de kan levere et 3 V signal, men de kan ikke levere mere end 15 mA. Derfor bruger vi en motorstyring.

Tilslut den røde motorledning til P8 på motorstyringen og den sorte motorledning til P12 på motorstyringen. For at forlænge de sorte og røde motorledninger skal du tilslutte forlængerledninger ved hjælp af 641320-ledningsstikket / (Klemrække).

I kodeeksemplet nedenfor brugte vi to micro:bits. For at gøre projektet mere interessant sender vi en besked fra jordfugtighedssystemet til vandpumpe-systemet, når det er tid til at vande.



Kode for jordfugtighedssensor:

```

on start
  radio set group 1

forever
  set Moisture to analog read pin P1
  show number Moisture
  pause (ms) 500
  if Moisture <= 500 then
    radio send string 'Dry'
  
```

Vandpumpekode, herunder manuel start og stop af pumpen. Hastigheden vist nedenfor er 30% af maksimal pumpehastighed. Og modtagerkode til vand, når jordsensoren er tør.

```

on start
  radio set group 1

on button A pressed
  motor 1 on direction forward speed 30

on button B pressed
  turn off motor 1
  
```

```

on radio received receivedString
  if receivedString = 'Dry' then
    show icon
    motor 1 on direction forward speed 20
    pause (ms) 100
    play sound
      start frequency 5000
      end frequency 0
      duration 500
      until done
    pause (ms) 350
    turn off motor 1
    clear screen
  
```

Et andet vigtigt træk ved en motorstyring er, at den kan give dig negativ spænding, for eksempel for at få en motor til at gå i bakgear, hvilket ikke vil gøre her.

Alternativt projekt:

Hvis dit vandhus ikke behøver at regulere vandpumpens hastighed, kan du udskifte motorstyringen med et relæ eller en switch.



The 3 V water pump is perfect for creating your own self watering greenhouse, or water fountain project.

Necessary accessories:

Simple Water Fountain:

- 663039 water pump
- 038530 silicone tube
- on/off switch
- 641320 wire connector
- extra wire

Create your own simple water fountain by connecting the water pump directly to a 3 to 4.5 V power source. We recommend a 4.5 V battery or the universal power supply (355035) Use a wire connector to extend the wires of the water pump (soldering the small wires can be difficult), so that the power supply can be connected away from the water. Add a switch into the circuit. The pump will operate at full capacity as long as the switch is turned on. If you are interested in regulating the speed of the pump, see the instructions for the self watering greenhouse below.

Self Watering Greenhouse

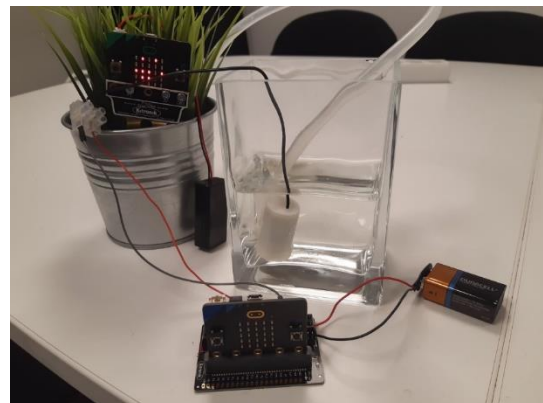
- 663039 water pump
- 038530 silicone tube
- 663013 motor controller
- 641320 wire connector

- 663002/663020 microbit
- 663024 soil moisture probe
- extra wire

In your self watering greenhouse, you will be able to determine the moisture of the greenhouse/plant using a soil moisture probe. You will use the micro:bit to read the value of the probe, in order to determine if you need to turn on the water pump. The motor controller is necessary as its outputs are designed to deliver sufficient current to drive the water pump. You might be tempted to connect the water pump directly to P0, P1, or P2 on the microbit, as they can deliver a 3 V signal, but they cannot deliver more than 15 mA. That is why we will be using a motor controller.

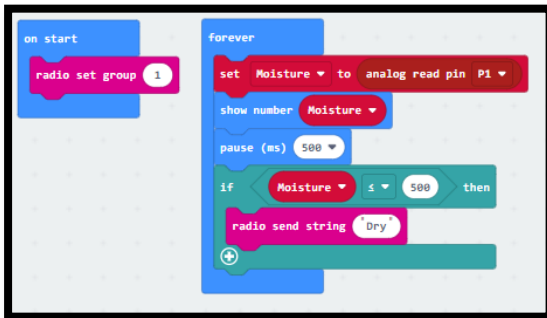
Connect the red motor wire to P8 on the motor controller and the black motor wire to P12 on the motor controller. To extend the black and red motor wires, connect extension wires using the 641320 wire connector.

In the code example below, we used two micro:bits. To make the project more interesting, we send a message from the soil moisture system to the water pump system when it is time to water.



Soil moisture sensor code:

Water pump code, including manual start and stop of pump. The speed shown below is 30% of maximum pumping speed.

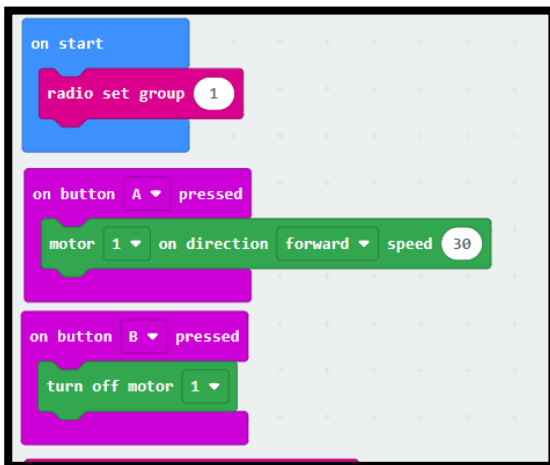


```

on start
  radio set group 1

forever
  set Moisture to analog read pin P1
  show number Moisture
  pause (ms) 500
  if Moisture <= 500 then
    radio send string Dry
  
```

Water pump code, continued. Receiver code to water when soil sensor is dry.

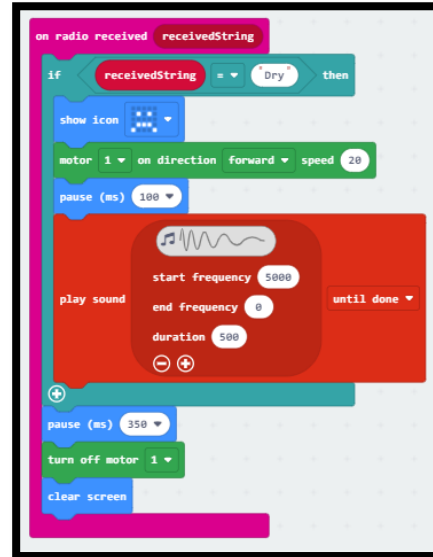


```

on start
  radio set group 1

on button A pressed
  motor 1 on direction forward speed 30

on button B pressed
  turn off motor 1
  
```



```

on radio received receivedString
  if receivedString = Dry then
    show icon
    motor 1 on direction forward speed 20
    pause (ms) 100
    play sound
      start frequency 5000
      end frequency 0
      duration 500
      until done
    pause (ms) 350
    turn off motor 1
    clear screen
  
```

Alternative project:

If your watering greenhouse does not need to regulate the speed of the water pump, you can replace the motor controller with a relay or switch.

Another important feature of a motor controller is that it can give you negative voltage, for example to make a motor go in reverse, which we will not be doing here.