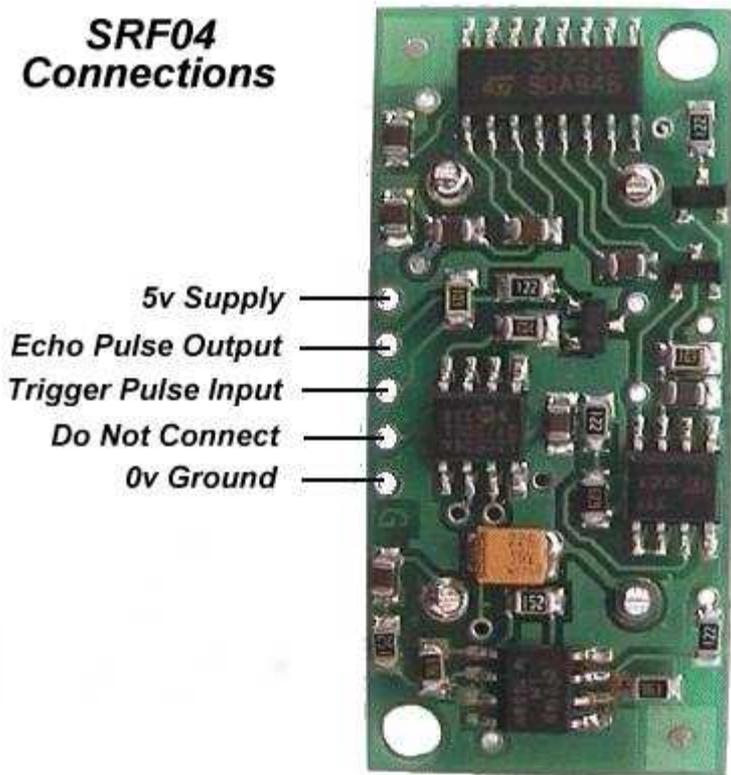


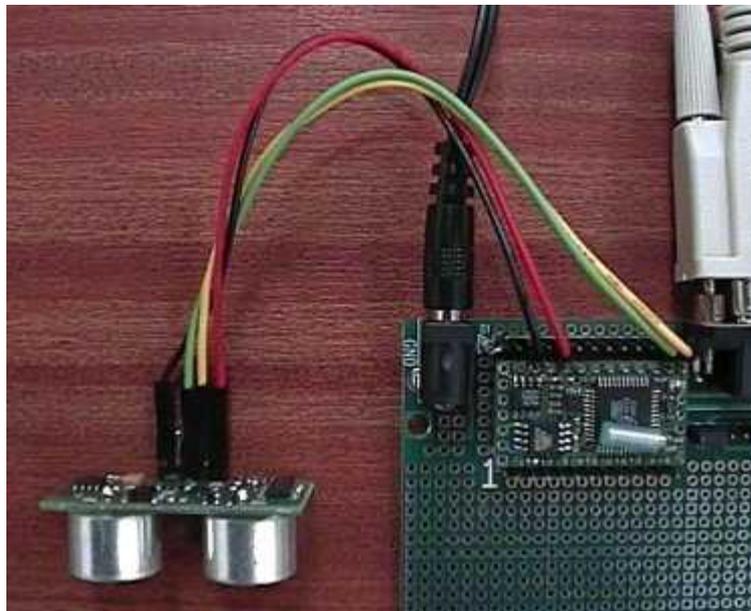
### **SRF04 Connections**



- |                  |   |                            |
|------------------|---|----------------------------|
| <i>Voltage</i>   | - | <i>5v only required</i>    |
| <i>Current</i>   | - | <i>30mA Typ. 50mA Max.</i> |
| <i>Frequency</i> | - | <i>40KHz</i>               |

<i>Max Range</i>	- 3 m
<i>Min Range</i>	- 3 cm
<i>Sensitivity</i>	- Detect 3cm diameter broom handle at > 2 m
<i>Input Trigger</i>	- 10uS Min. TTL level pulse
<i>Echo Pulse</i>	- Positive TTL level signal, width proportional to range.
<i>Small Size</i>	- 43mm x 20mm x 17mm height

## Connecting SRF04 Sonar Modules to the BX-24

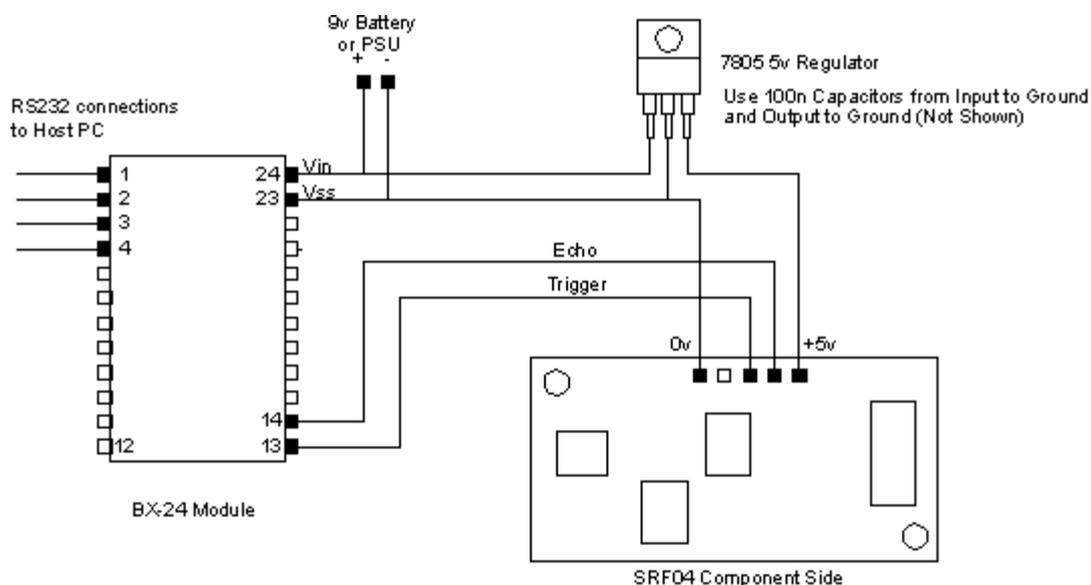


### Introduction

The SRF04 module is controlled by a trigger pulse from the BX-24 host controller of around 10uS duration. After receiving the trigger pulse, the SRF04 will raise its echo pulse and wait for a returning echo. As soon as the echo is detected by the SRF04, it will lower its echo line again. The BX-24 host controller will measure the width of the echo pulse and use this to calculate the range.

Although we have powered the SRF04 from the BX-24 in the photo above, the BX-24's internal 5v regulator is not suitable for powering much external circuitry. It will power a single SRF04 OK, but anything more and I would recommend you use a separate 5v regulator as shown in the schematic below. Further SRF04's can be connected, not shown here, with each SRF04 requiring its own input and output pins.

### Circuit Schematic for connecting an SRF04 Sonar Module to the BX-24



```

*****
**
**      SRF04 Demonstration Software for the BX-24      **
**
**      Copyright 2002 - Devantech Ltd      **
**      Commercial use of this software is prohibited      **
**      Private and educational use only is permitted      **
**
**      Written by Gerald Coe - February 2002      **
**
*****

Sub Main()

```

```

Const EchoPin As Byte = 14      ' Define which pins you want to use here
Const TrigPin As Byte = 13

Dim Range As Integer

Call PutPin(EchoPin, bxInputTristate)
Call PutPin(TrigPin, bxOutputLow)

do

    Call PulseOut(TrigPin, 10, 1)    ' 10uS Trigger pulse

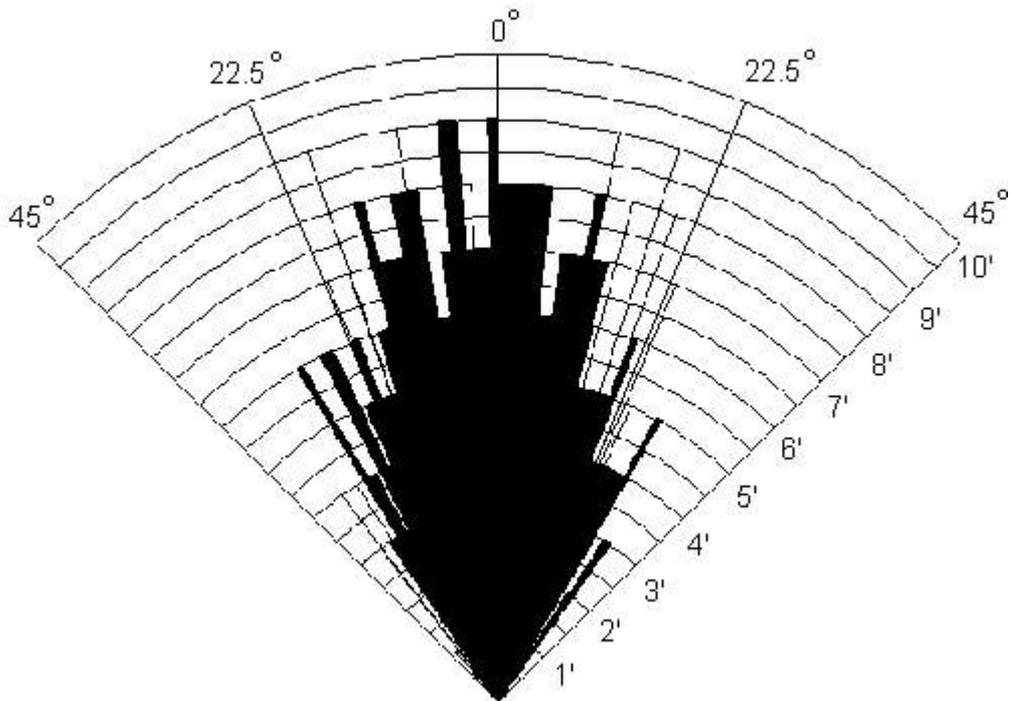
    Range = PulseIn(EchoPin, 1) \ 54    ' use 54 for Cm or 137 for Inches

    Debug.Print "Range is "; CStr(Range)

    Call Delay(0.1)                  ' 100mS to next ping (minimum is 10mS)

loop
End Sub

```



### ' **Sensor Information**

This high performance ultrasonic range finder is compact and measures an amazingly wide range from 3cm to 3m. This ranger is perfect for your robot, or any other projects requiring accurate ranging information.

If you are new to electronics in general, and microcontrollers in particular, the book "Programming and Customizing the Basic Stamp Computer" by Scott Edwards is highly recommended. The founder of the "Stamp Applications" series in Nuts & Volts magazine has compiled a comprehensive guide to understanding this technology.

### **How does it work?**

The URS is a straight-forward ultrasonic range sensor. The host microcontroller provides a positive going pulse on the INIT pin on the sonar module to begin a reading. After the INIT input pin goes low, the sonar module emits a ping. After the ping, the ECHO output goes high. It returns low again when the module receives an echo. Check out a BS2 example program

```
' Devantech SRF04 Example
```

```
'  
wDist  var    word
```

```
INIT   con    0
```

```
ECHO   con    1
```

```
' CONVERSION FACTORS
```

```
'  
' The PULSIN command returns the round-trip echo time in 2us units  
' which is equivalent to the one-way trip time in 1us units.
```

```
' distance = (echo time) / (conversion factor)
```

```
' use 74 for inches      (73.746us per 1 in)
```

```
' use 29 for centimeters (29.033us per 1 cm)
```

```
convfac con    74    ' use inches
```

```
'-----
```

```
main
```

```
    gosub sr_sonar  
    debug dec wDist, cr  
    pause 200  
    goto main
```

```
sr_sonar :
```

```
    pulsout INIT,5    ' 10us init pulse  
    pulsins ECHO,1,wDist ' measure echo time  
    wDist=wDist/convfac ' convert to inches  
    pause 10  
    return
```

(주)로보블럭시스템

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