

YTP - Module YTP01

Arduino & Micro-Controllers

**Teachers Handbook LESSON 7**

**Ultrasonics**

# Goals & Success Factors

### Lesson Goal

* To understand how ultrasonics and ultrasonic sensors work
* To complete at least 2 circuits utilising ultrasonic sensors

### Lesson Success Factor(s)

* Build and code a circuit with a working ultrasonic sensor which activates an LED when the ultrasonic distance threshold is breached
* Build a multi-level security system which has LEDS and a buzzer that are triggered depending on the different ultrasonic distance thresholds breached.

# Runsheet (Guideline)

PART 1

00:00 Introduction

00:05 Goals & Success Factors

00:10 Recap of last week

00:15 Introduction to ultrasound

00:20 Introduction to ultrasonic sensors

00:30 Build an ultrasonic sensor circuit

00:45 Code/Test/Run the circuit

01:00 BREAK

PART 2

01:15 The security system circuit intro

01:25 Build security system circuit

01:40 Code/Test/Run the circuit

02:00 FINISH

**Extension(s)**

Add buttons to test your LEDs

Add an alarm sound using your buzzer

# Students Pre-work

Watch the following video:

**Arduino Ultrasonics Tutorial:** https://youtu.be/ZejQOX69K5M

# Teachers Pre-work

Read the following tutorial about Ultrasonic sensors:

<https://randomnerdtutorials.com/complete-guide-for-ultrasonic-sensor-hc-sr04/>

Watch the following video:

**Arduino Ultrasonics Tutorial** https://youtu.be/ZejQOX69K5M

Student Homework

More ultrasonic videos: https://youtu.be/6F1B\_N6LuKw

# Handouts (optional)

n/a

Materials Needed

Arduino IDE

Arduino UNOs

Breadboards

Jumper wires

LEDs

220 Ohm resistors

Ultrasonic sensors

Buzzers

# Handbook

Handouts

n/a

Resources

**n/a**