Interfacciamo i sensori
Servos, Sonar, Compass

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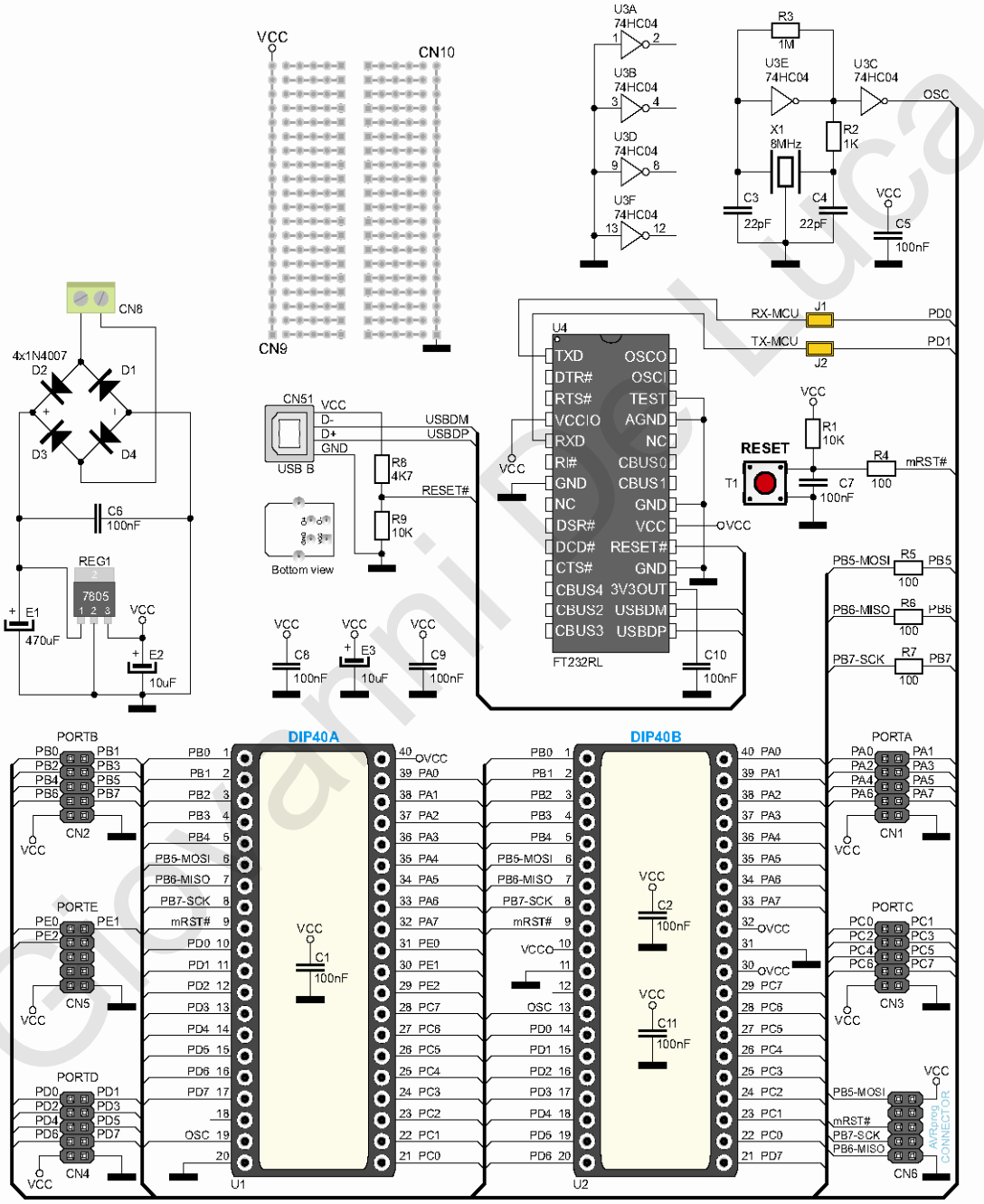
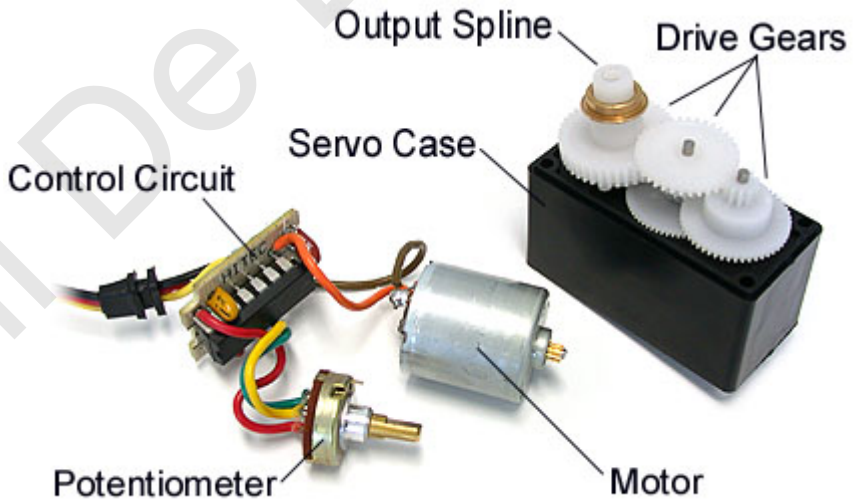
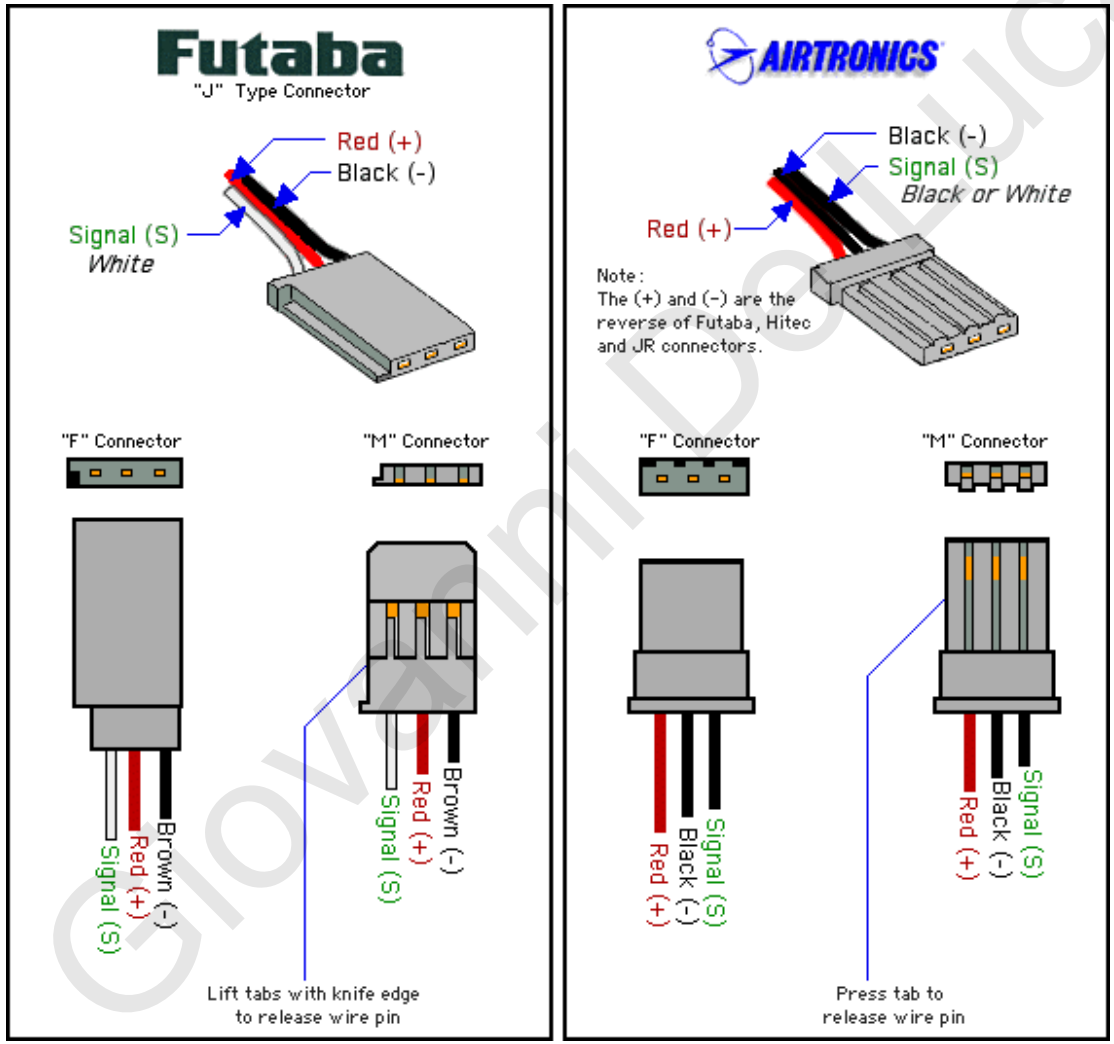


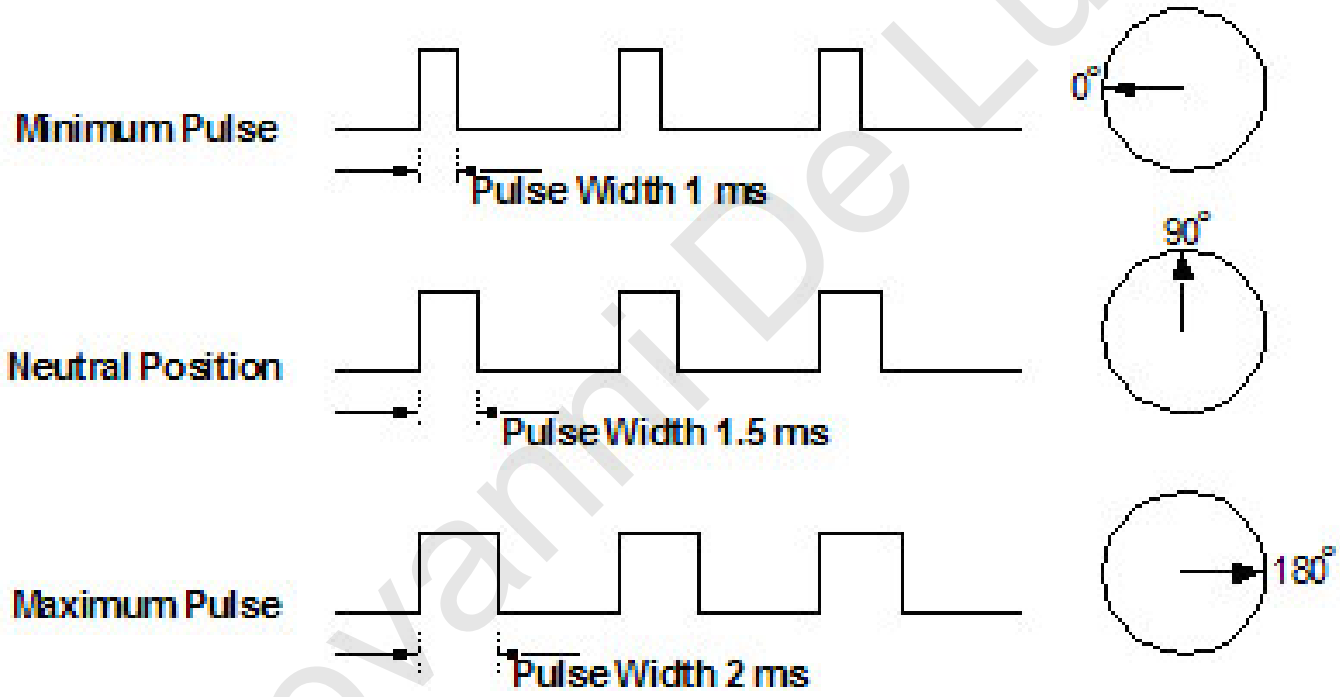
Servos RC



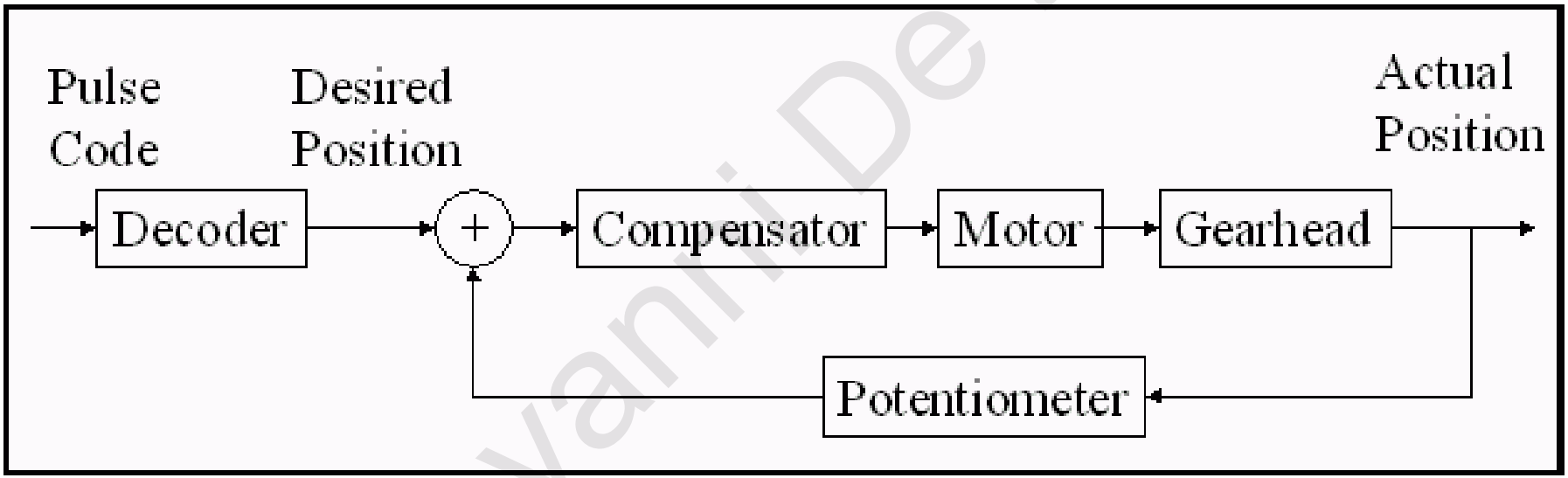
Connettori



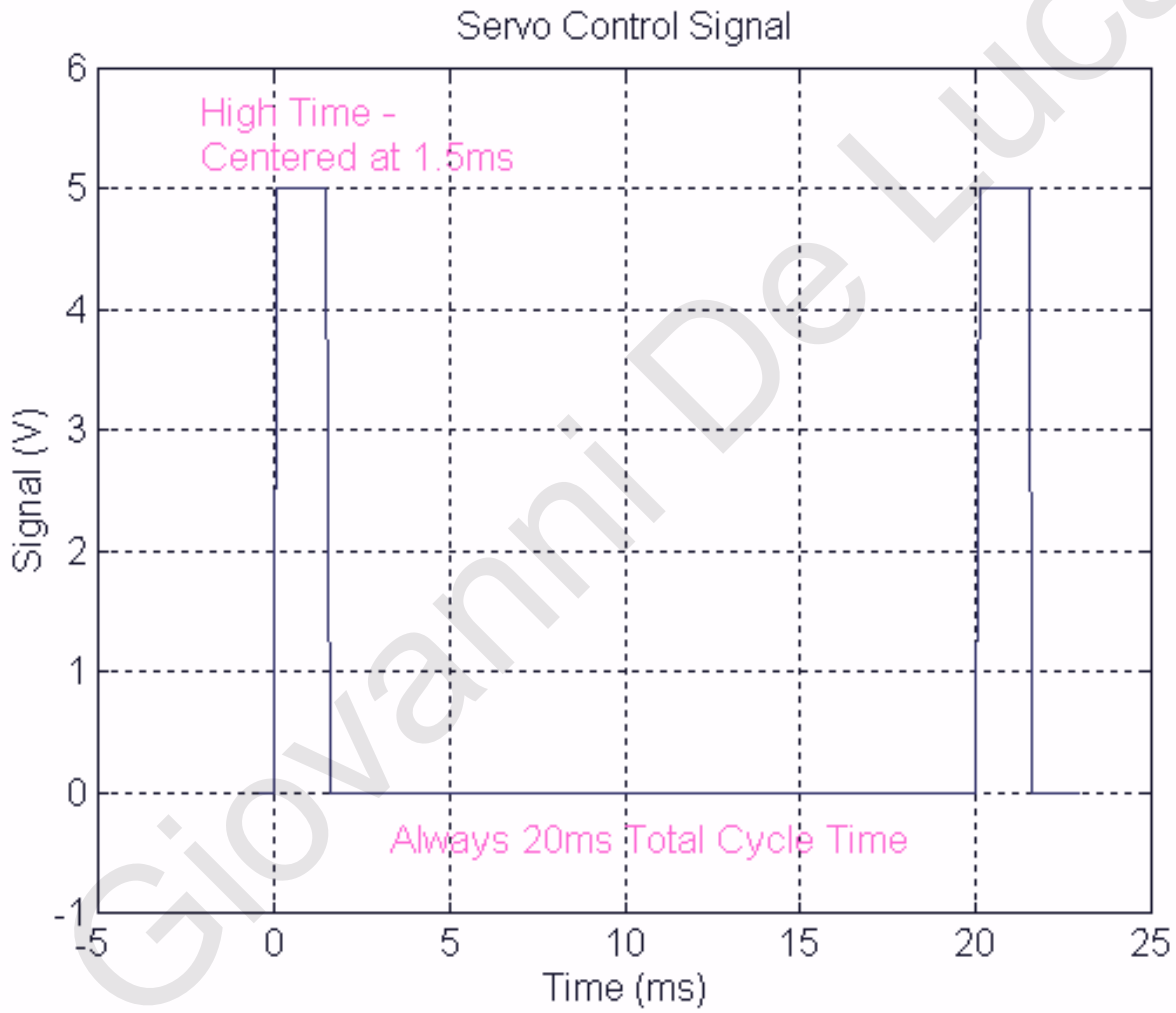
Angular Position – Pulse width



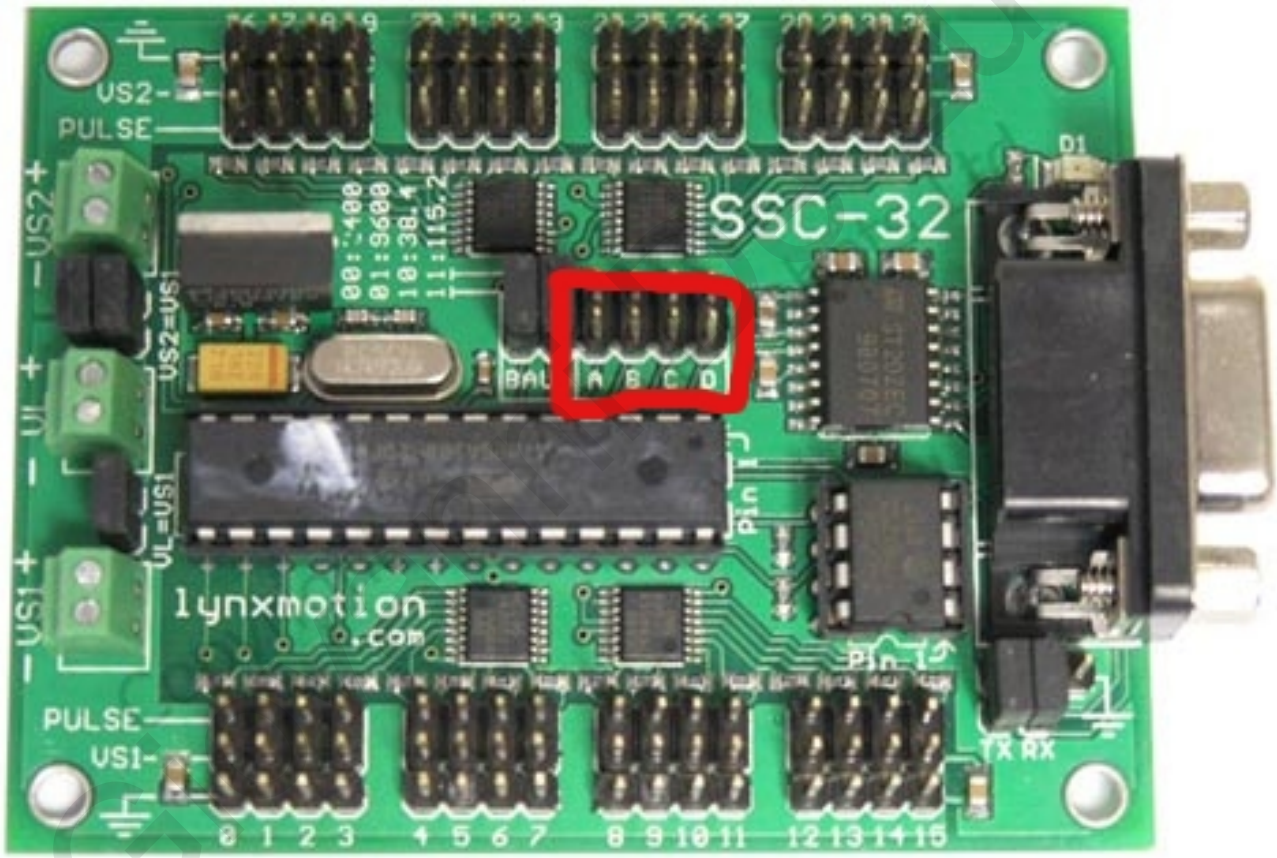
PID - Position control



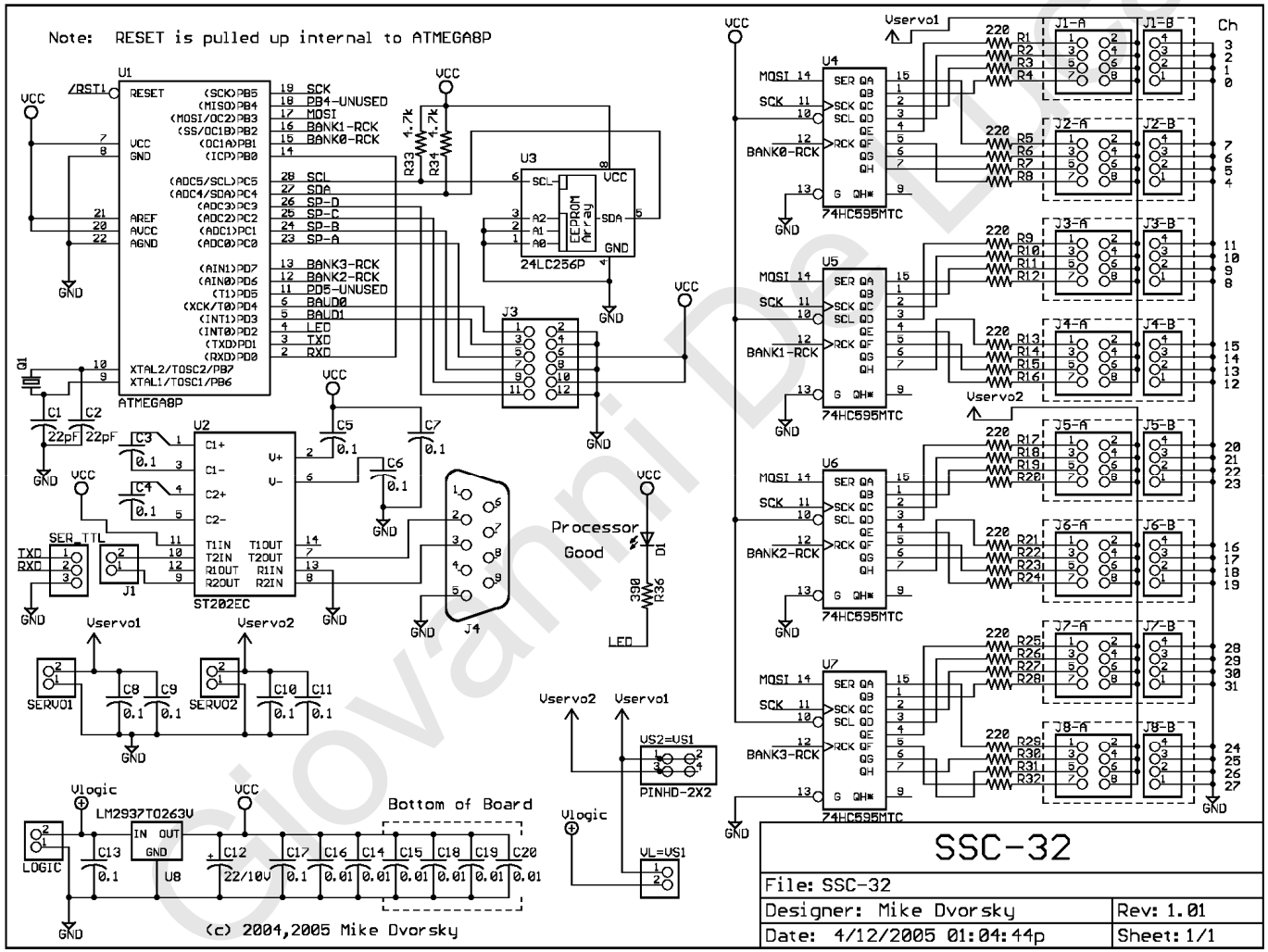
Servo control signal



SSC-32 Board


VS2-
PULSE
VS2+
VS2=VS1
VL+
VL=VS1
VS1+
SSC-32
D1
BAU
A B C D
lynxmotion
.com
Pin 1
PULSE
VS1-
TX RX
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

SSC-32 Schematic



Si può controllare con il uC AVR

CONFIG SERVOS

Action

Configures how much servo's will be controlled.

Syntax

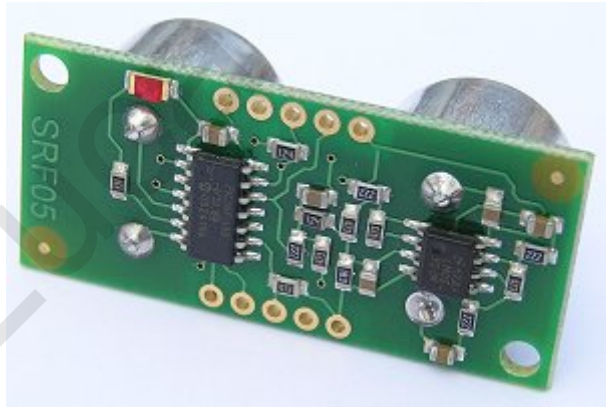
CONFIG SERVOS = X , Servo1 = Portb.0 , Servo2 = Portb.1 , Reload = rl , INTERVAL=t

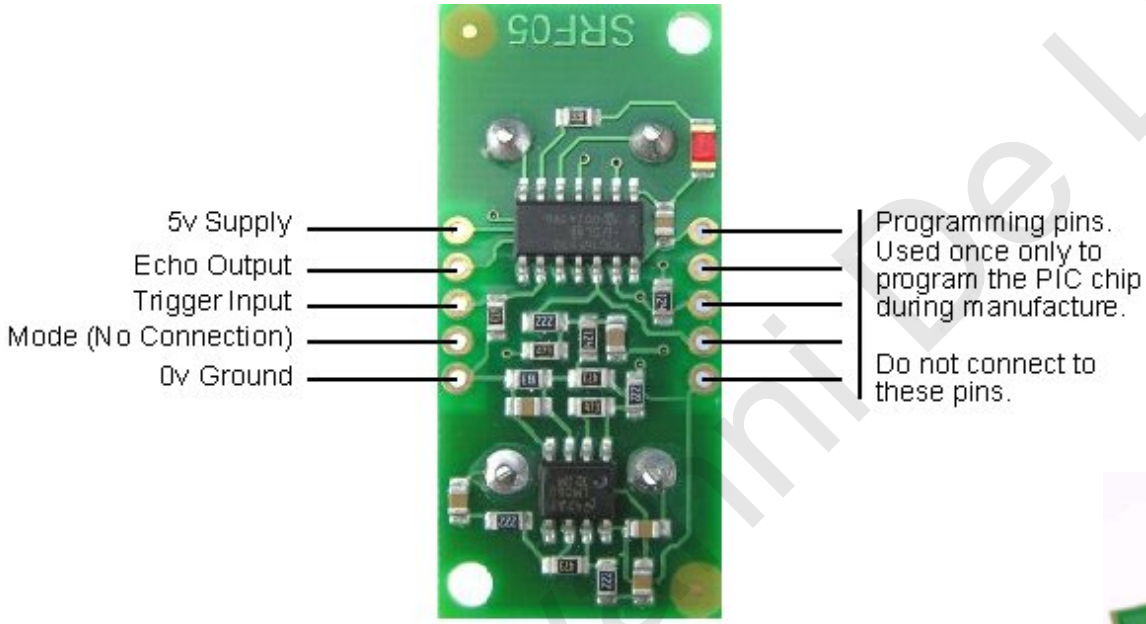
Remarks

Servo's need a variable pulse in order to operate. The CONFIG SERVOS directive will set up a byte array with the servo pulse width values and will initialize an ISR that uses TIMER0.

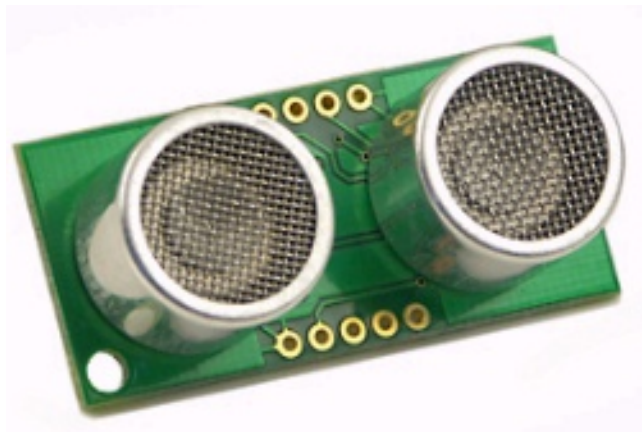
X	The number of servo's you want to control. Each used servo will use one byte of SRAM.
servox	The port pin the servo is attached too.
reload	The reload value for the ISR in uS.
Interval	The update interval. Using the interval option will result in using alternative servo code optimized for servos.

Sonar SRF05

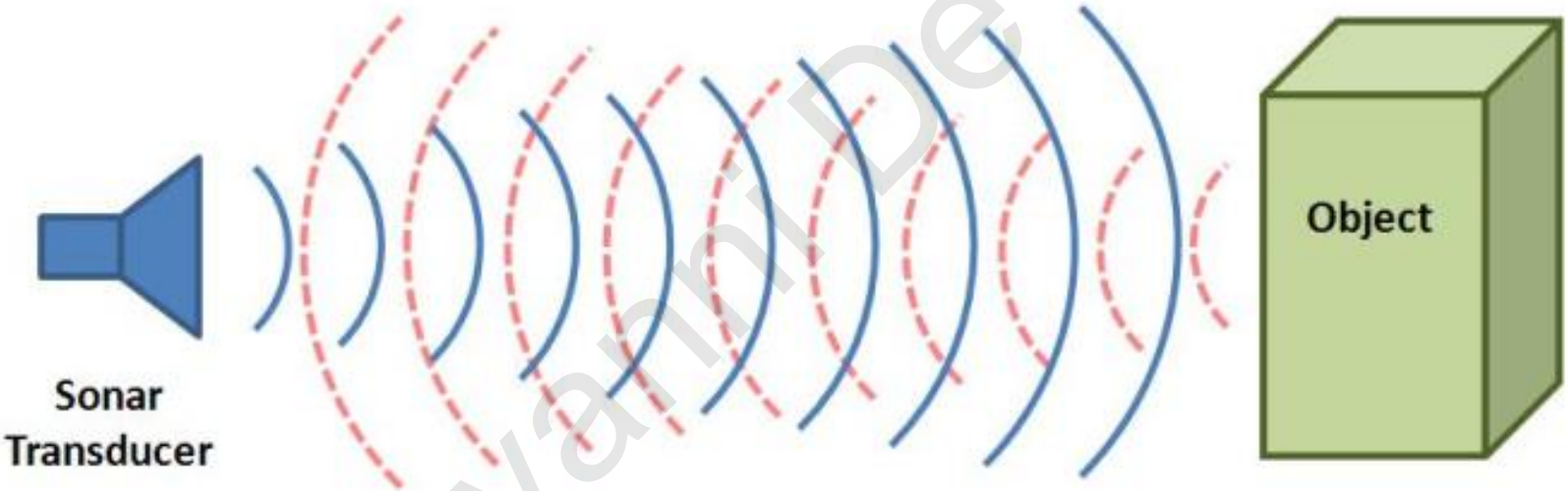




Connections for 2-pin Trigger/Echo Mode (SRF04 compatible)



Principio di funzionamento



Basic sonar illustration – a transducer generates a sound pulse and then listens for the echo.

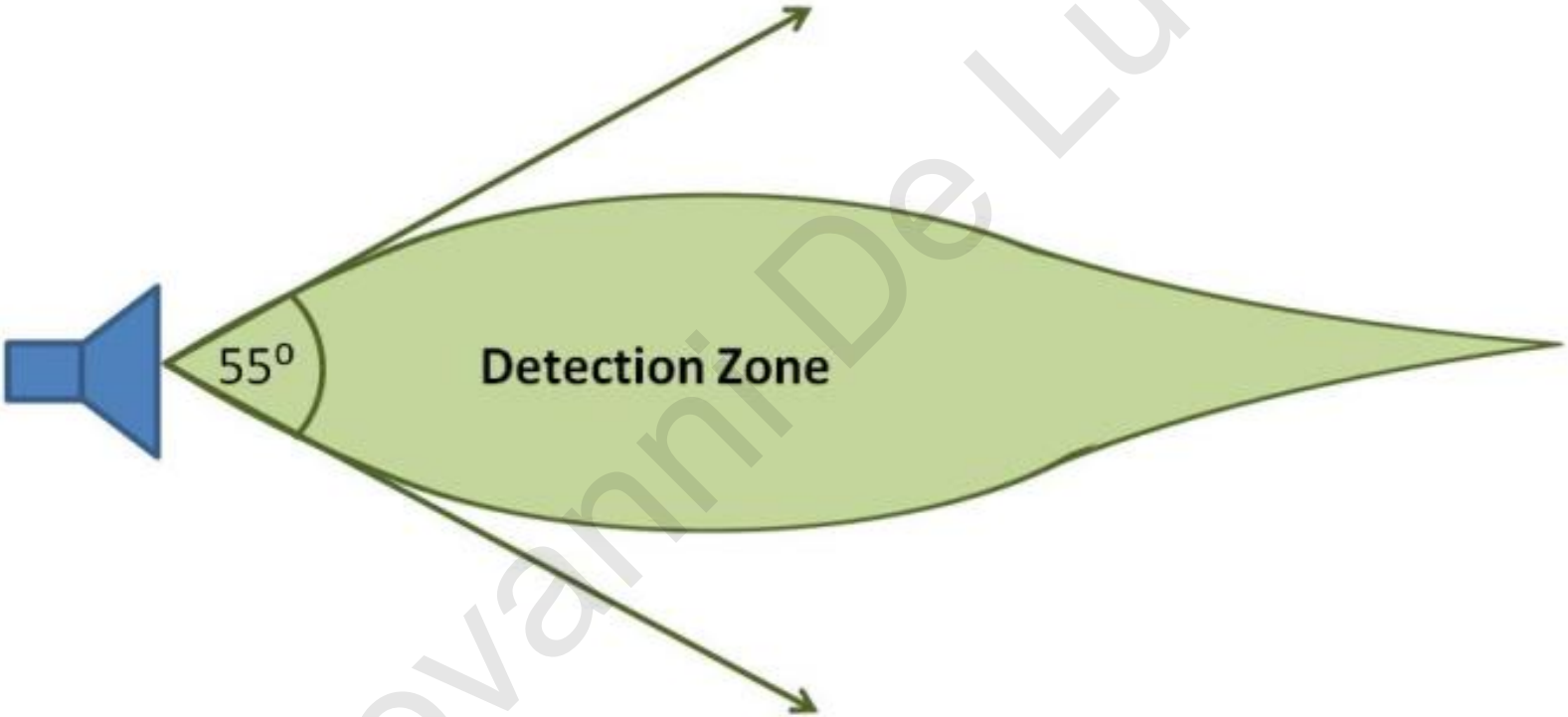
SRF05 - echo

A soft object may produce little or no echo. An object at an angle relative to the transducer might reflect an echo away from the sensor.

Calcolo Distanza

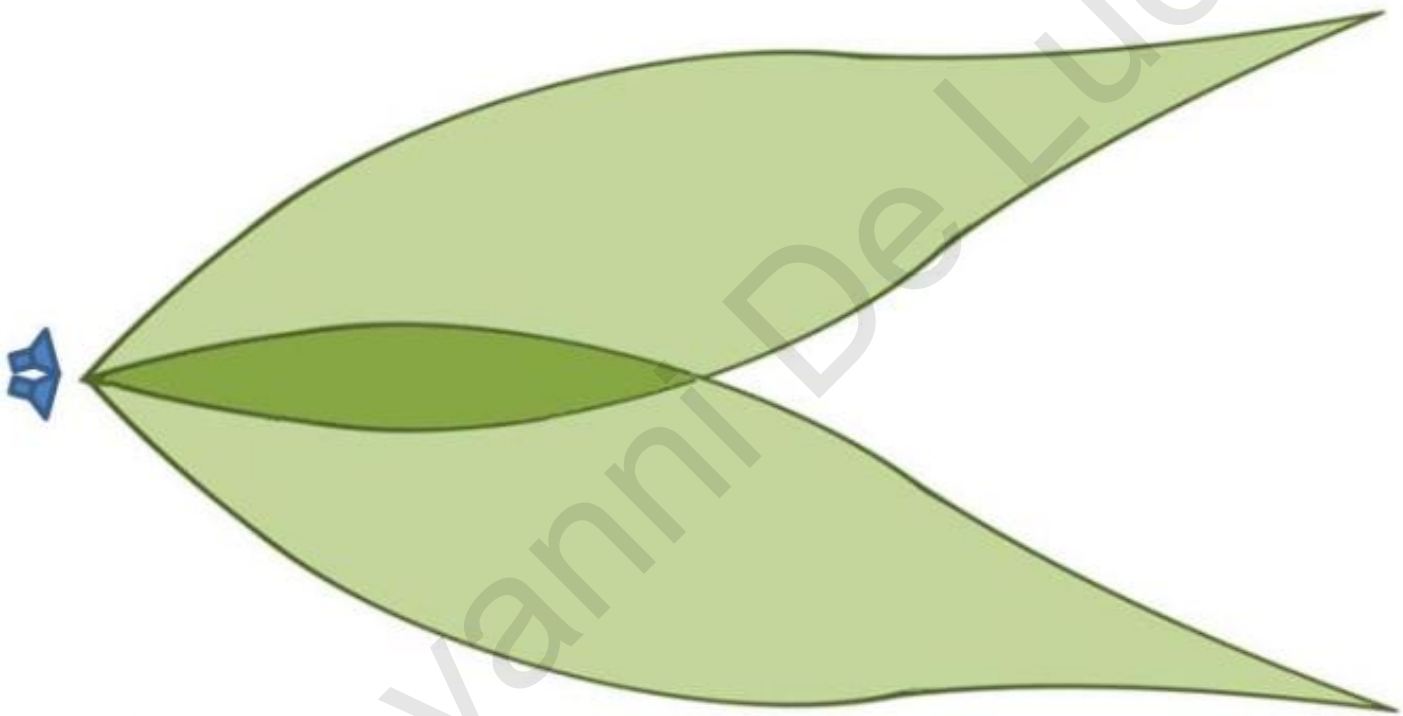
- Velocità del suono = **343** meters al secondo (o 0.0343 centimetri per microsecondo).
- Il tempo in uSec moltiplicato per **0.0343** dà la distanza in centimetri.
- Ricordare che il risultato deve essere diviso per 2 perché la durata dell'impulso è il valore totale per la intera distanza tra andata e ritorno della onda sonora.
- Distanza = **durata * .0343/2**

Detection zone



The detection zone of the SRF05 is about 1 meter across at its widest point and just over 4 meters long.

Detection zone – 30°



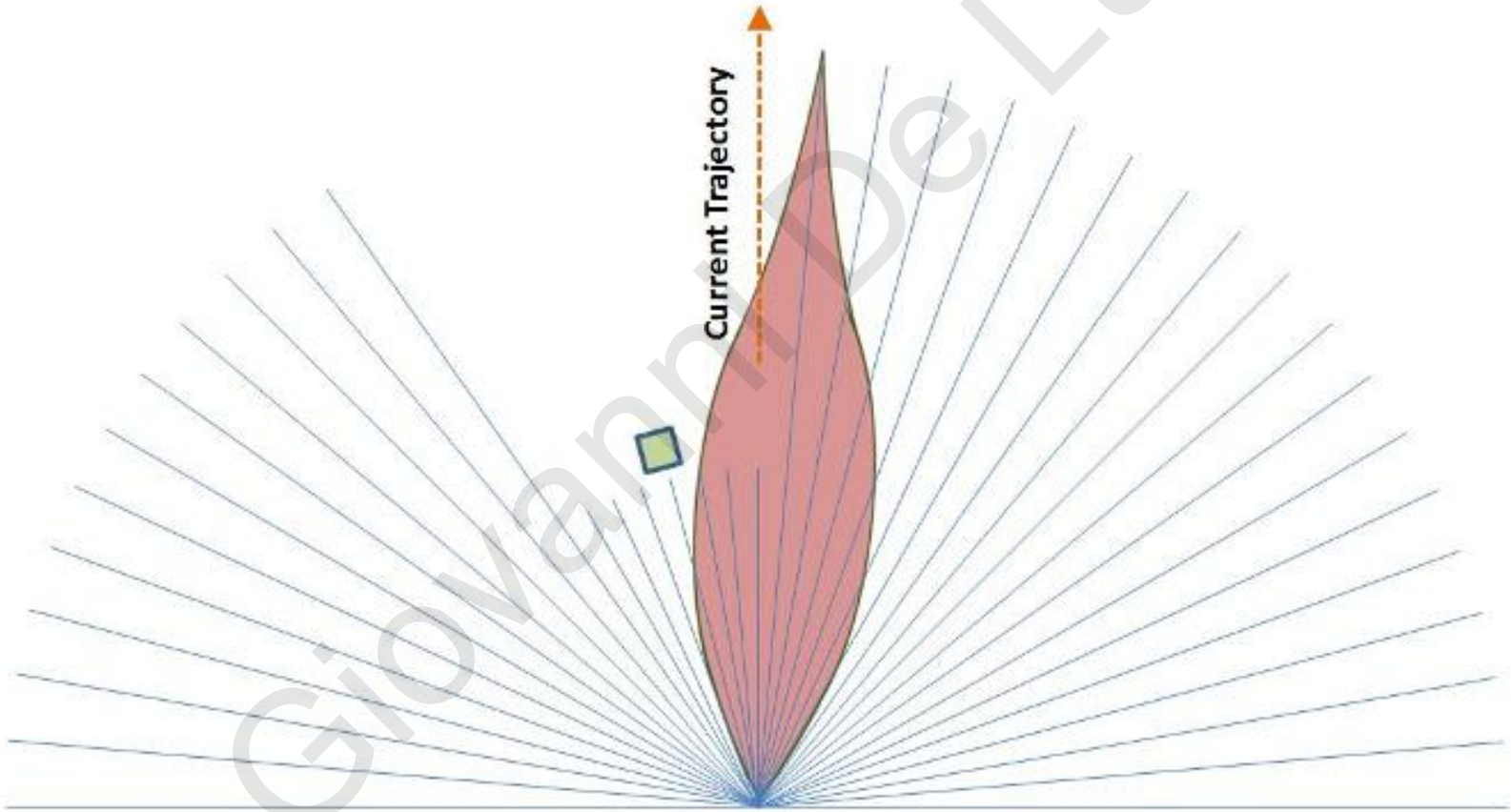
The detection zones of two SRF05s mounted at a 30° angle. The overlapping zone makes it possible to distinguish left, right, and center obstacles.

Action Strategy

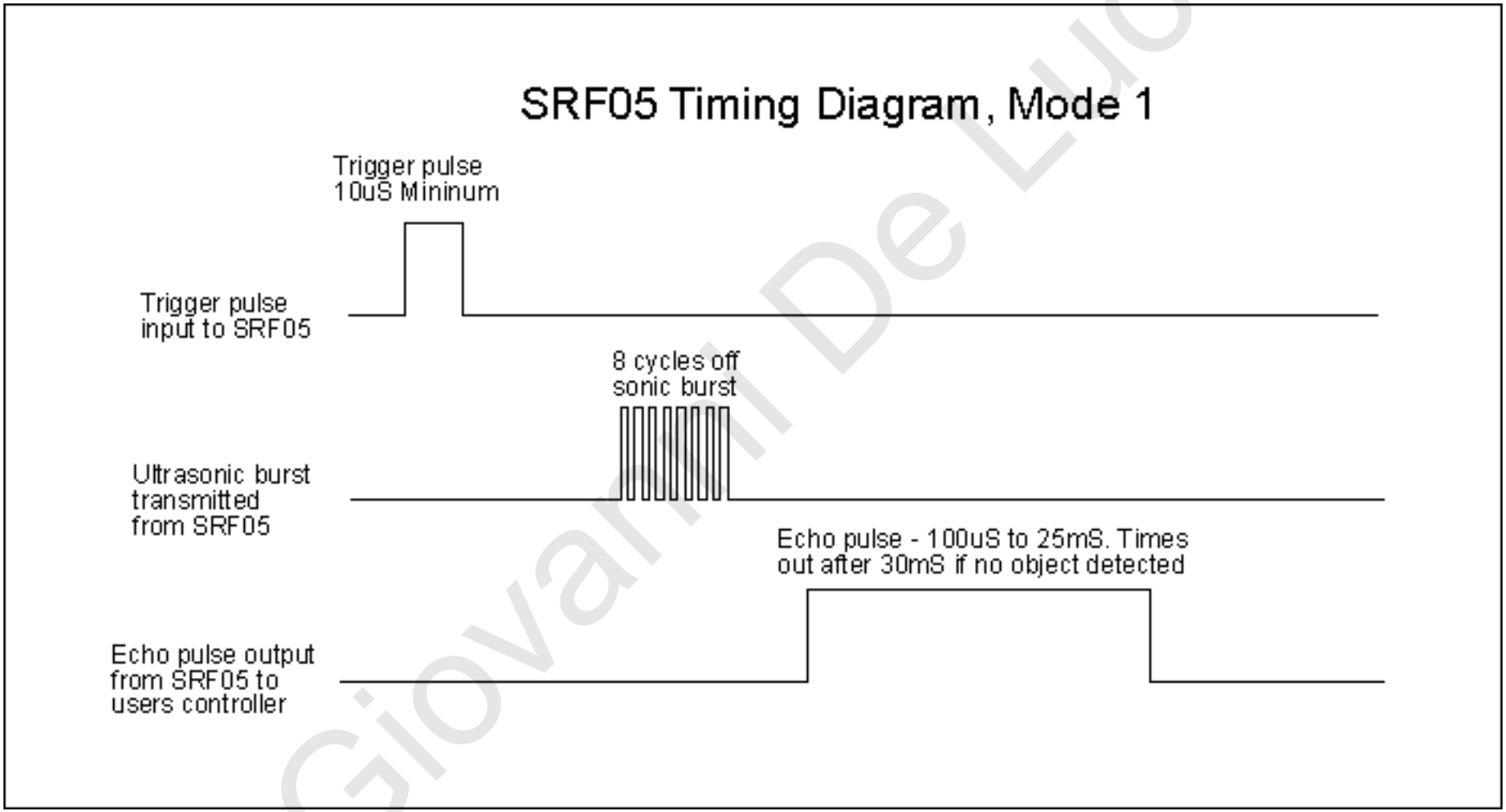
Left Sensor	Right Sensor	Status	Action
No Obstacle	No Obstacle	Clear	Move Forward
Obstacle	No Obstacle	Left Obstacle	Slight Right Turn
No Obstacle	Obstacle	Right Obstacle	Slight Left Turn
Obstacle	Obstacle	Center Obstacle	Broad Turn (Left or Right)

Detection zone area

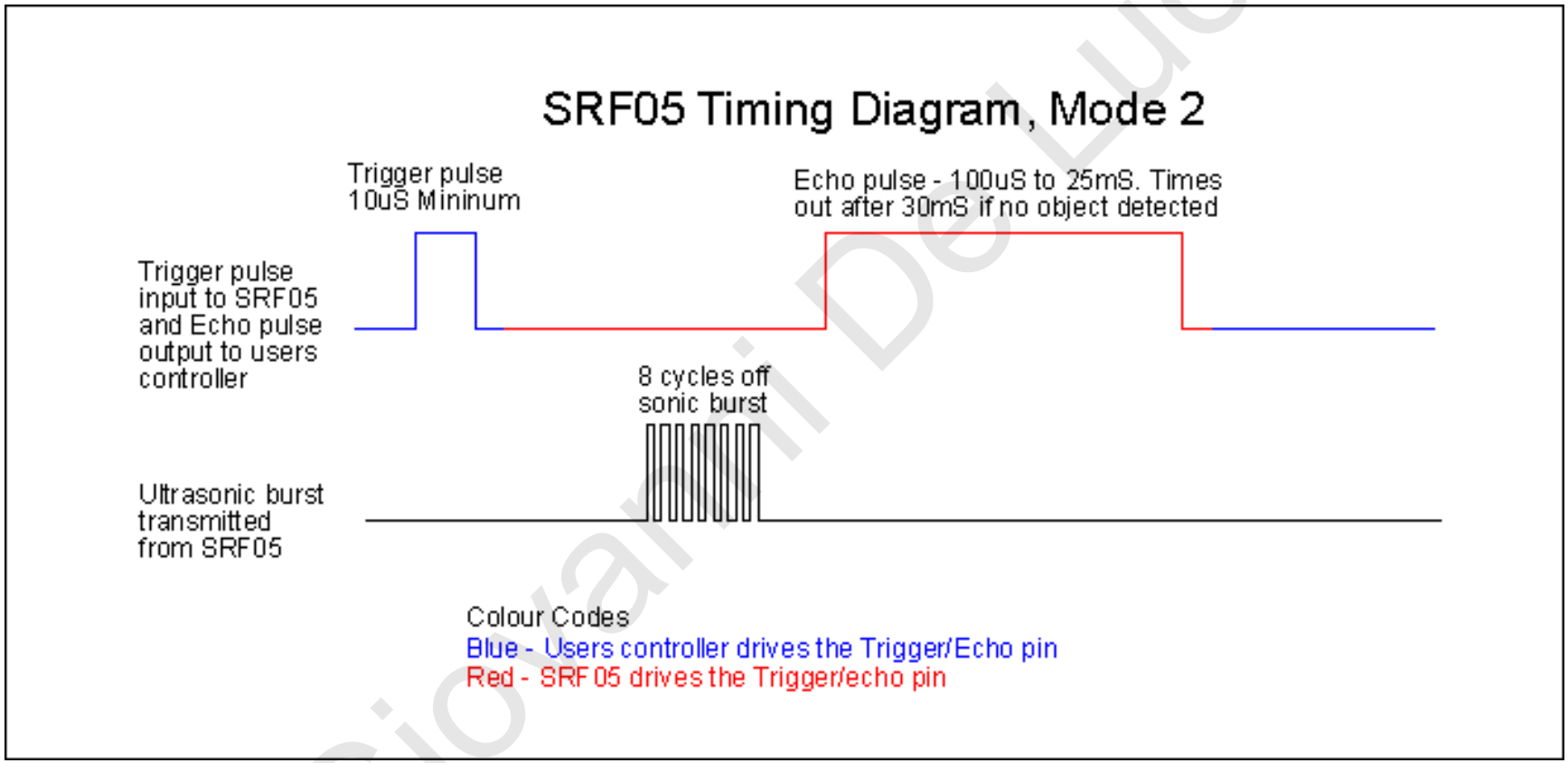
Detection zones can also be used to indicate that an area is clear. Even though a ping on the current trajectory detects the echo of a possible obstruction, superimposing the detection zone on a neighboring trajectory that registered as unobstructed reveals that the path is in fact safe.



SRF05 Timing Diagram M1



SRF05 Timing Diagram M2



Bascom - Pulseout

PULSEOUT

Action

Generates a pulse on a pin of a PORT of specified period in 1uS units for 4 MHz.

Syntax

PULSEOUT PORT , PIN , PERIOD

Remarks

PORT	Name of the PORT. PORTB for example
PIN	Variable or constant with the pin number (0-7).
PERIOD	Number of periods the pulse will last. The periods are in uS when an XTAL of 4 MHz is used.

The pulse is generated by toggling the pin twice, thus the initial state of the pin determines the polarity. The PIN must be configured as an output pin before this statement can be used.

Bascom - Pulsein

PULSEIN

Top Previous

Action

Returns the number of units between two occurrences of an edge of a pulse.

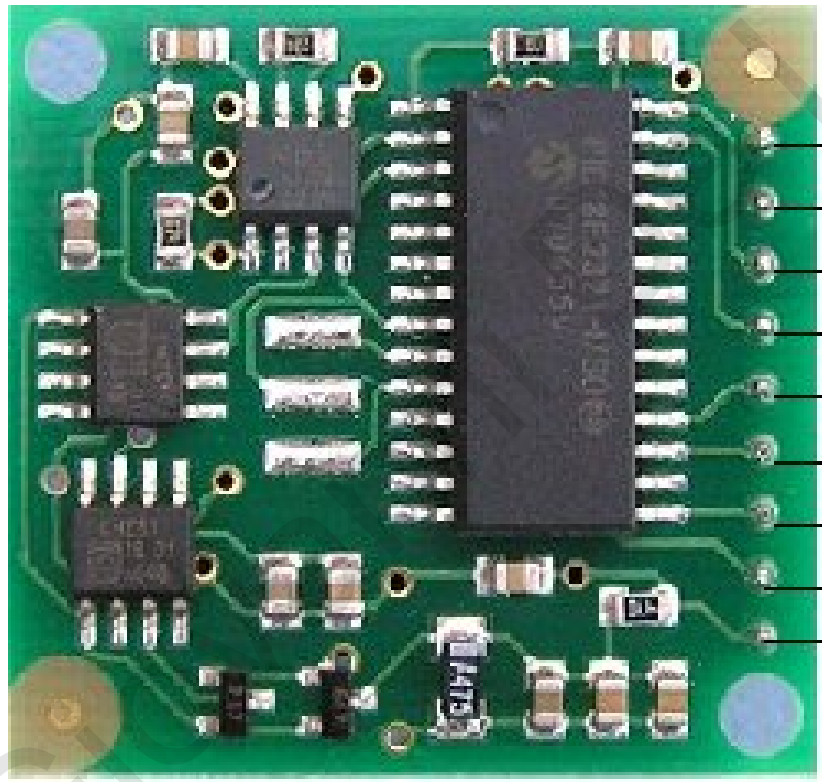
Syntax

PULSEIN var , PINX , PIN , STATE

Remarks

var	A word variable that is assigned with the result.
PINX	A PIN register like PIND
PIN	The pin number(0-7) to get the pulse time of.
STATE	May be 0 or 1. 0 means sample 0 to 1 transition. 1 means sample 1 to 0 transition.

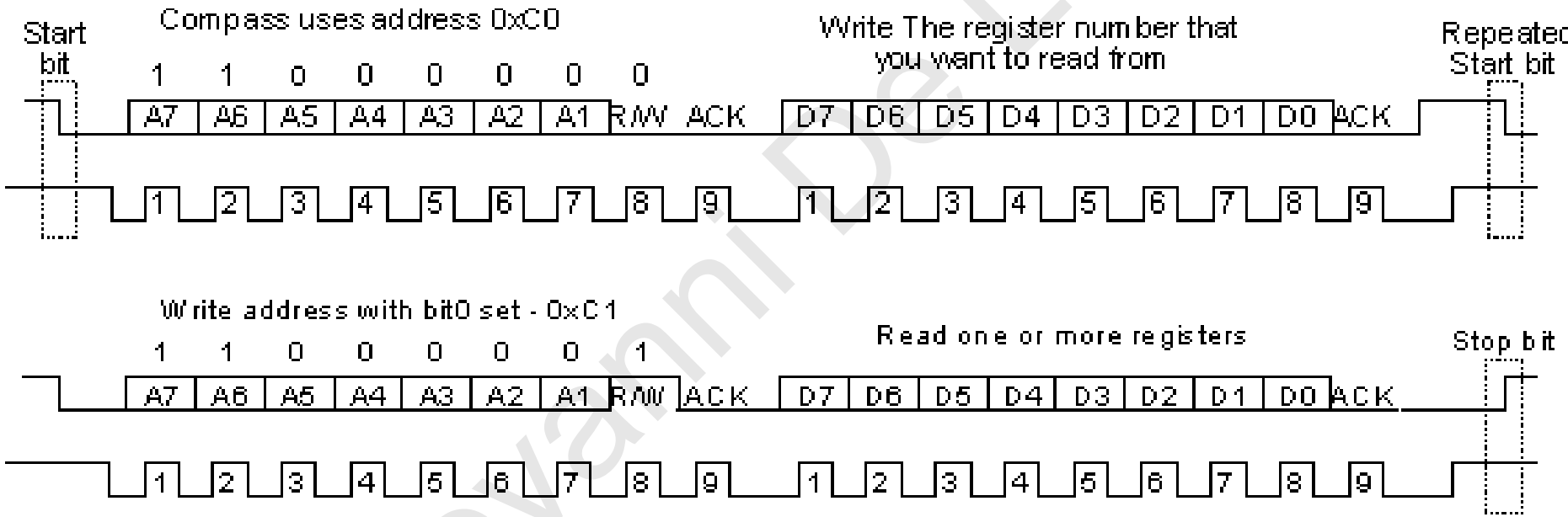
Bussola elettronica – CMPS-03



North

Pin 9 - 0v Ground
Pin 8 - No Connect
Pin 7 - No Connect
Pin 6 - Calibrate
Pin 5 - Calibrating
Pin 4 - PWM
Pin 3 - SDA
Pin 2 - SCL
Pin 1 - +5v

I2C interface



Register Function

Register	Function
0	Software Revision Number, Rev14 or higher - for earlier Revisions click here
1	Compass Bearing as a byte, i.e. 0-255 for a full circle
2,3	Compass Bearing as a word, i.e. 0-3599 for a full circle, representing 0-359.9 degrees.
4,5	Internal Test - Sensor1 processed difference signal - 16 bit signed word
6,7	Internal Test - Sensor2 processed difference signal - 16 bit signed word
8,9	Internal Test - Sensor1 raw data - 16 bit signed word
10,11	Internal Test - Sensor2 raw data - 16 bit signed word
12	Unlock code1 - Unlock codes are required for I2C address change or restoring factory calibration
13	Unlock code2
14	Unlock code3
15	Command Register - See text.

Bascom – I2C interface

```
'-----------------------------------------
'                                Read Bussola
'-----------------------------------------
Function Read_bussola() As Word

  Local Gradi As Single
  Local Gradi_1 As Byte
  Local Gradi_2 As Byte

  I2csend &HC0 , 2
  I2cstart
  I2cwbyte &HC1
  I2crbyte Gradi_1 , Ack
  I2crbyte Gradi_2 , Nack
  I2cstop
  Gradi = Gradi_1 * 256
  Gradi = Gradi + Gradi_2

  Gradi = Gradi / 10
  Gradi = Int(gradi)
  Read_bussola = Gradi

End Function
'-----------------------------------------
```