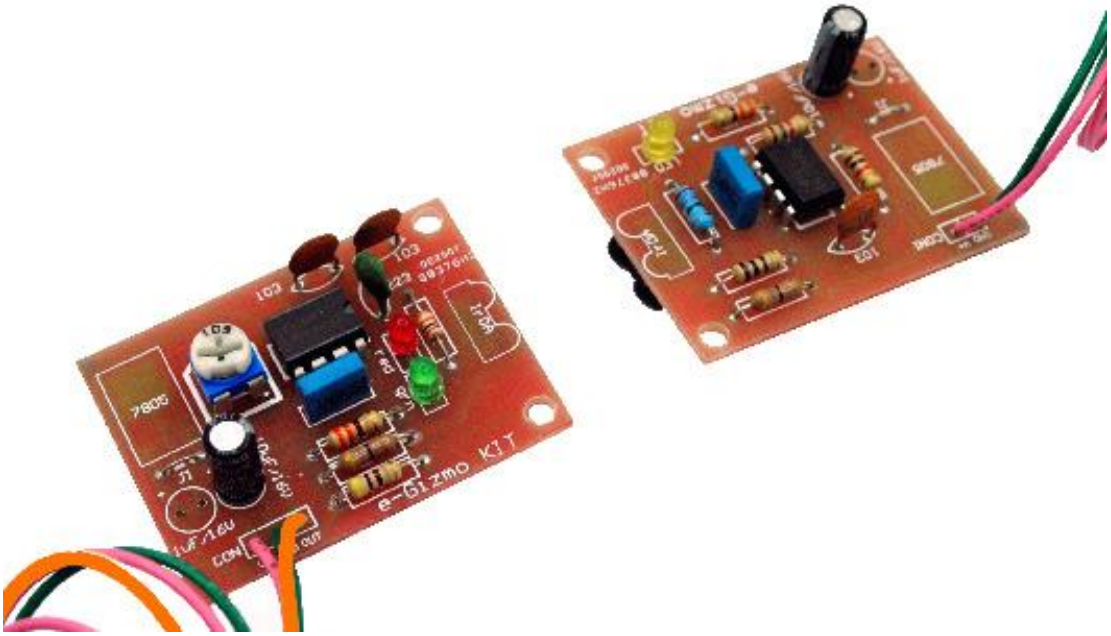
Through Beam Sensor

(Transmitter & Reciever)

Hardware Manual Rev 1r0



Detects objects passing in between the sensor transmitter and receiver modules. Sensor modules can be separated up to more than a meter. Use it to detect objects in the conveyor line system, pass through security, and many more systems that can apply.

A portable and easy to install kit that can be installed on every door for guest counter or people counter or any kind of pass through counting system, this kit is the most suitable for the job!. Uses infrared signals and signal adjustment for easy signal calibration.

Features & Specifications

- Power Requirement: 5VDC power supply or battery. Optional 7805 regulator for extended voltage range of 7-9VDC.
- Separation: 1 meter Typical
- Sensors: 2 IR sensors (1 for transmit and 1 for receive).
- 1 active high logic output. (logic high object is present in between sensors) ,1 TTL active high logic output. (logic high when object is present).

MAJOR COMPONENTS PRESENTATION

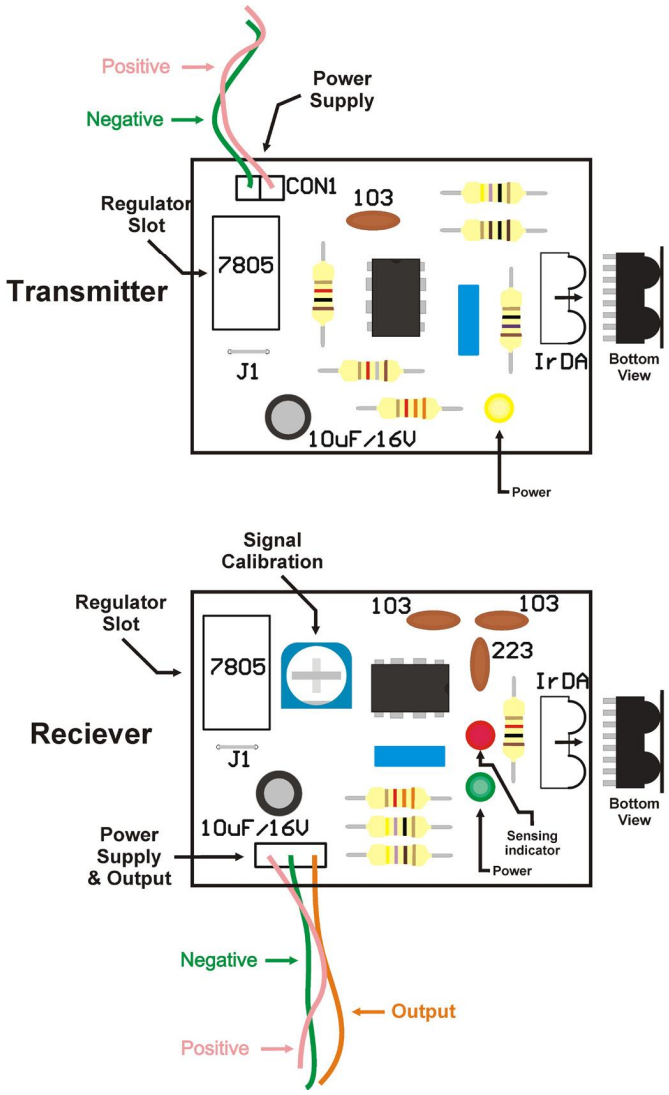


Figure 1. *Through Beam Sensor (Transmitter & Reciever) and its major components.*

Major Parts Description:

IrDA (TX) - Transmit signal to the *Reciever.*
IrDA (RX) - Recieve signal from the *Transmitter.*
Signal Calibration - Where you can calibrate the receiving signal.
LED (Yellow) - Transmitter's Power indicator.
LED (Red) - Receiver's sensing indicator.
LED (Green) - Receiver's Power indicator.
CON1 - Transmitter's Power supply wires.
CON - Receiver's Power supply and Output wires.

Table 1. *Through Beam Sensor Parts List (TX)*

I.D.	*Details*
C1	10uF/16V
C2	1uF/16V
C3	103 capacitor
C4	152 capacitor
D1	LED (Yellow)
J1	Jammed port
R1	100 resistor
R2	27 resistor
R3	1.8K resistor
R4	820 resistor
R5	27 resistor
R6	100 resistor
U1	7805 Regulator
U2	LM555 timer
U3	IrDA

Table 2. *Through Beam Sensor Parts List (RX)*

I.D.	*Details*
C1	10uF/16V
C2	1uF/16V
C3	223 capacitor
C4	103 capacitor
C5	103 capacitor
Ct	152 capacitor
D1	LED (Red)
D2	LED (Green)
J1	Jammed port
R1	100 resistor
R2	100 resistor
R3	27 resistor
R4	10K resistor
Rt	10K trimmer Resistor
U1	7805 Regulator
U2	LM567 tone decoder
U3	IrDA

OPERATION - TRANSMITTING, RECIEVING & CALIBRATION

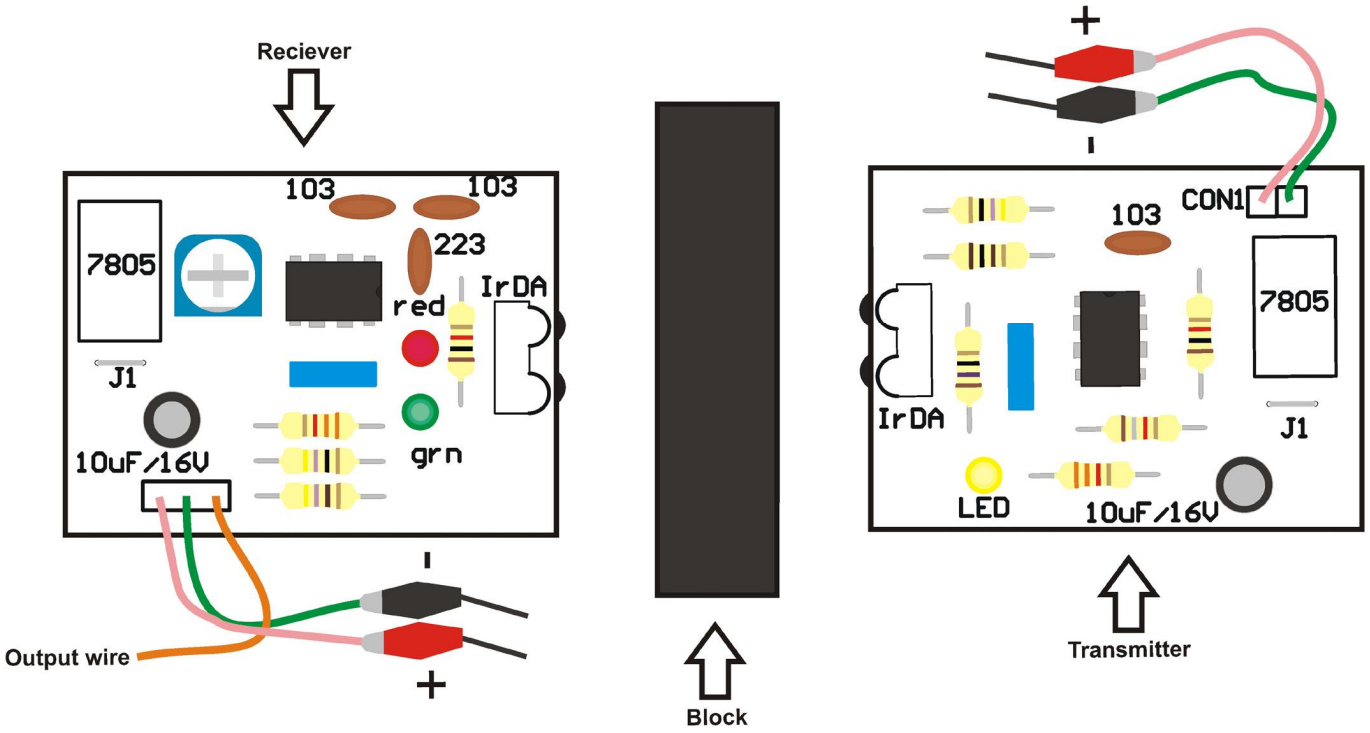
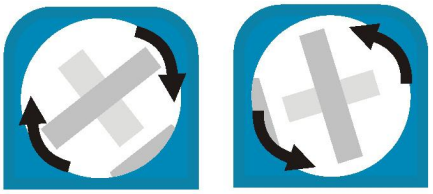


Figure 2. *Through Beam Sensor (Transmitter & Reciever) example operation.*

They can detect each object or any entity passing through them. The illustration above shows how an object block passing through and how they detect it.

To start, first attach a 5V power supply to the transmitter and receiver, if you put a regulator the power voltage that can be supplied is 7-12V. Connect the green wire to negative and connect the pink wires to positive orange wire serve as the output. Start testing by using your hands, put your hands between the two, if the receiver's LED (Red) lights it means that they detect objects normally.



If they don't, use the signal calibration or the trimmer resistor (can be seen in receiver). Simply rotate counterclockwise or clockwise until the Transmitter detects the receiver.

Figure 3. *Reciever's Signal Adjustor*

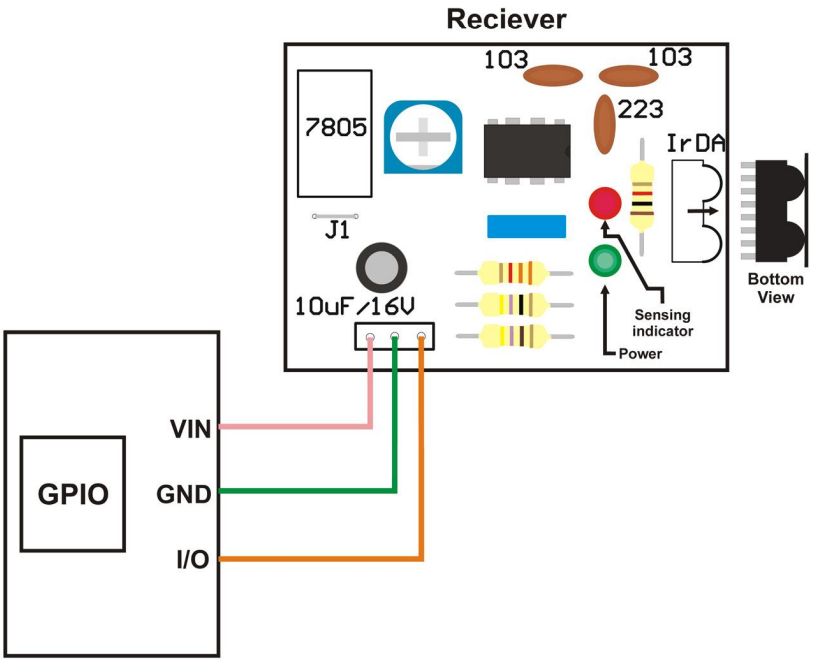
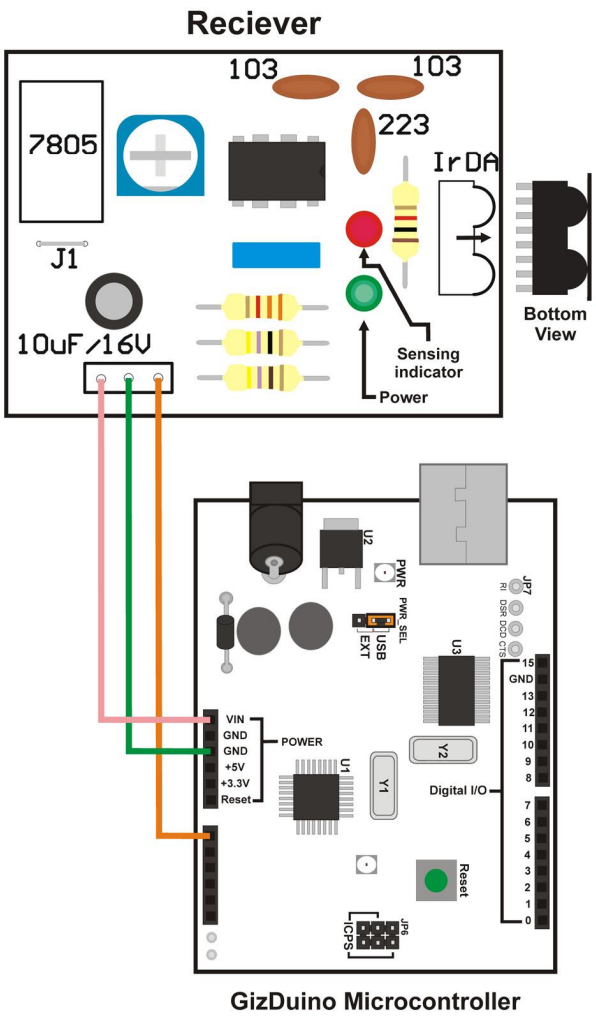


Figure 4. *Through beam sensor (Reciever) connected to a microcontroller.*

Figure 5. *Through beam sensor (Reciever) connected to gizDuino microcontroller*



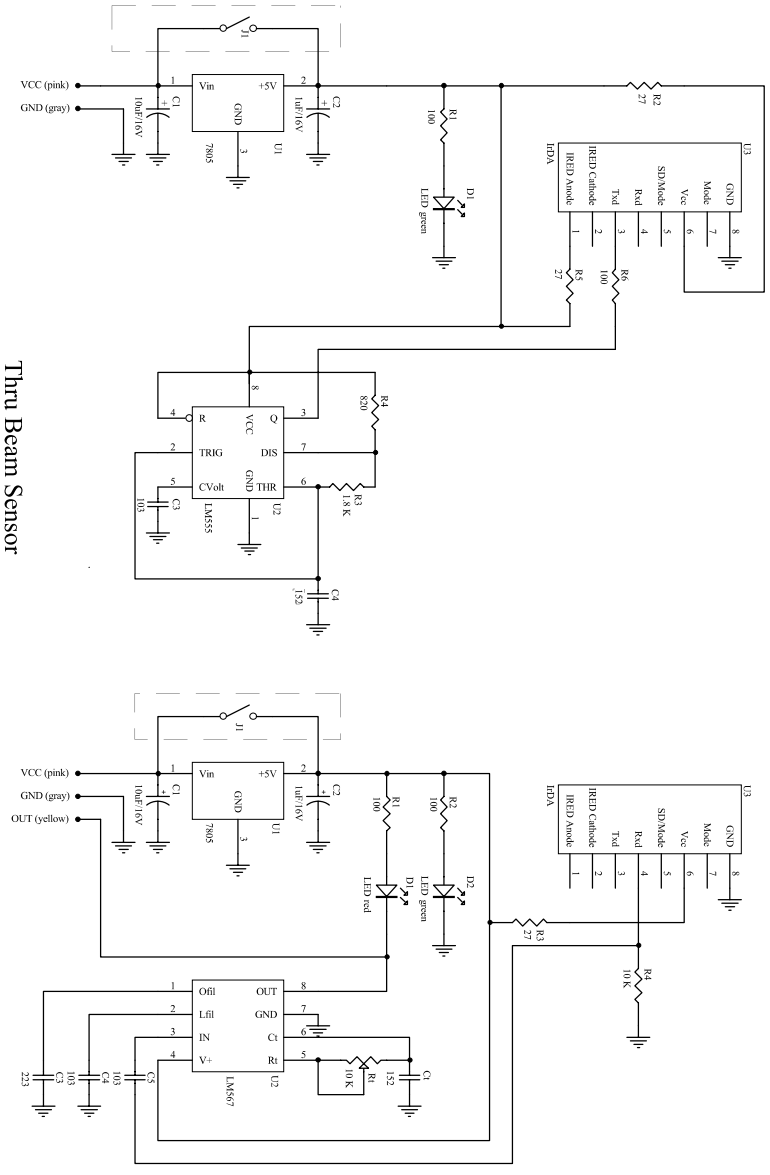


Figure 4. *Schematic Diagram of Through Beam Sensor*

PCB BOARD PRESENTATION

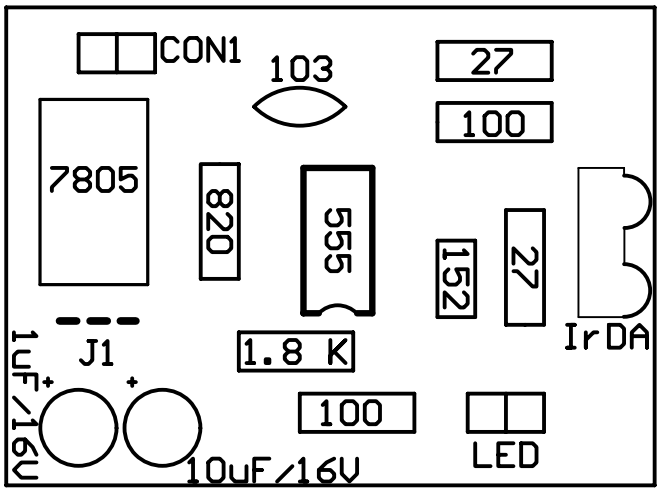


Figure 5. *Through Beam Sensor(TX) PCB (silkscreen layout)*

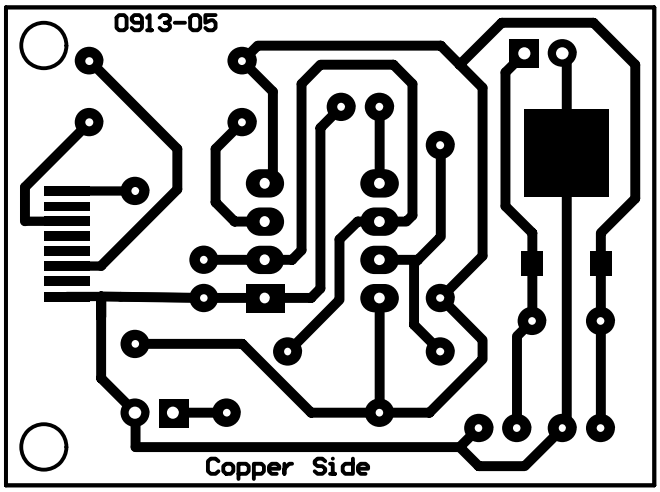


Figure 7. *Through Beam Sensor(TX) PCB Copper Pattern*

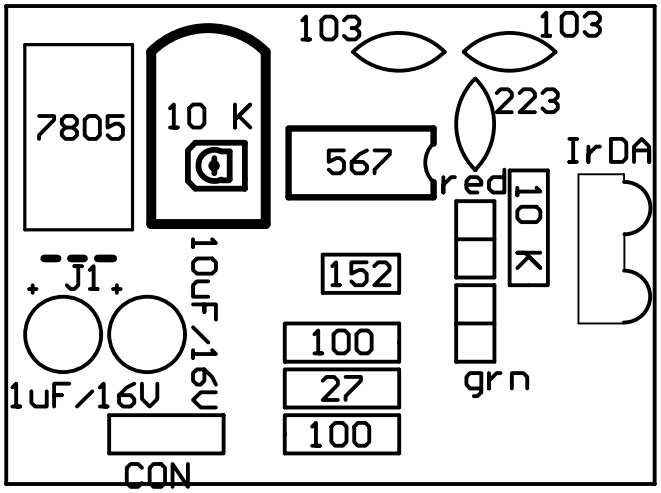


Figure 6. *Through Beam Sensor(RX) PCB (silkscreen layout)*

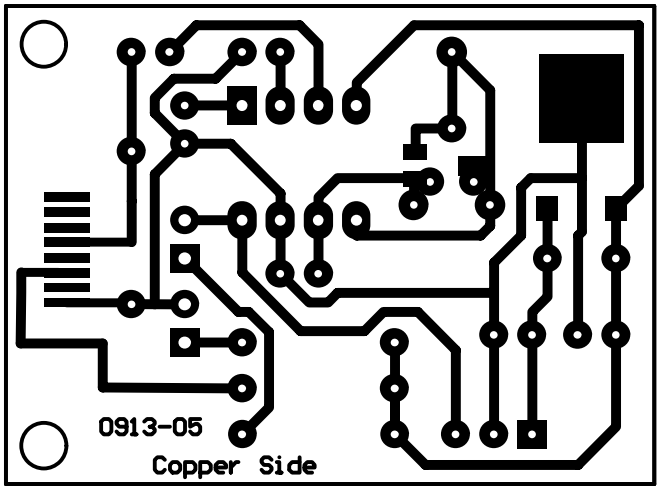


Figure 8. *Through Beam Sensor(RX) PCB Copper Pattern*