



# KUBE Single Chip TR156 - Sample Applications with Schematics

## 1 PIR-Motion-Detector Circuit

Supply voltage: 12V

Current consumption appx. 2mA

$T_{on} = 0s$

$T_{off} = 2s \dots 2048s$

no daylight sensor

digital output or transistor drive

### Turn-off:

Turn-off delay is used in most application to extend ventilation and light outputs and to bridge periods of no detected signals. Intruder Alarms generally use a setting of 8 sec. Light switches and HVAC controllers generally use 128 to 1024s.  $V_{in}$  for  $T_{off}$  is applied to pin 27.

$$V_{in} (V) = T_{off}$$

0 to 0.2	2s
0.5	4s
0.8	8s
1.1	12s
1.4	16s
1.7	24s
2.0	32s
2.3	48s
2.6	64s
3.0	96s
3.3	128s
3.6	256s
3.9	512s
4.2	768s
4.5	1024s
4.8 to $V_{CC}$	2048s

### Outputs:

The main output pin 24 can drive:

TTL and C-MOS loads

LED (integral current limiter to 0.5 mA)

Relay driver transistors.

For power relays, output pin 24 provides PWM modulation to reduce current drain. This mode is switched on automatically when a transistor is driven by the output, i.e. the output is not allowed to rise above 2 volts. The output is also available as inversed. (Pin 7)

There is a "presence" output (Pin 23) independent of the time settings, for an LED (integral current source 0.5 mA) to visualize that the detector works. This LED is delayed by 5 seconds to the sensor activation, so that a person can observe the unit switching on.





## 2 A Simple Activator

### Applications:

- Automatic light switch
- Intruder alarm
- Ventilation / air-conditioning controller
- Activator for displays and screen shows
- Automatic shut-off (energy saver) for coffee machines, photocopiers etc.
- Any other people-activated function

### Features:

- Supply voltage 7 to 30 VDC
- Current consumption appx. 2mA
- $T_{on} = 0s$
- $T_{off} = 2s \dots 2048s$
- Works day and night. (Photocell may be added, see circuit B below)
- Digital output or relay

### Turn-off delay:

Turn-off delay is used in most application to bridge periods of no detected signals. Intruder Alarms generally use a setting of 8 sec. Light switches and HVAC controllers generally use 128 to 1024s.  $V_{in}$  is the programmin voltage for  $T_{off}$  and is applied to pin 27. (Potentiometer P1, may also be substituted by two fixed resistors).

$V_{in}$ (V)	= $T_{off}$
0 to 0.2	2seconds
0.5	4s
0.8	8s
1.1	12s
1.4	16s
1.7	24s
2.0	32s
2.3	48s
2.6	64s
3.0	96s
3.3	128s
3.6	256s
3.9	512s
4.2	768s
4.5	1024s
4.8 to $V_{CC}$	2048 seconds

### Outputs:

The main output pin 24 can drive:

- TTL and C-MOS loads
- LED (integral current limiter to 0.5 mA, short-circuit proof)
- Relay driver transistors

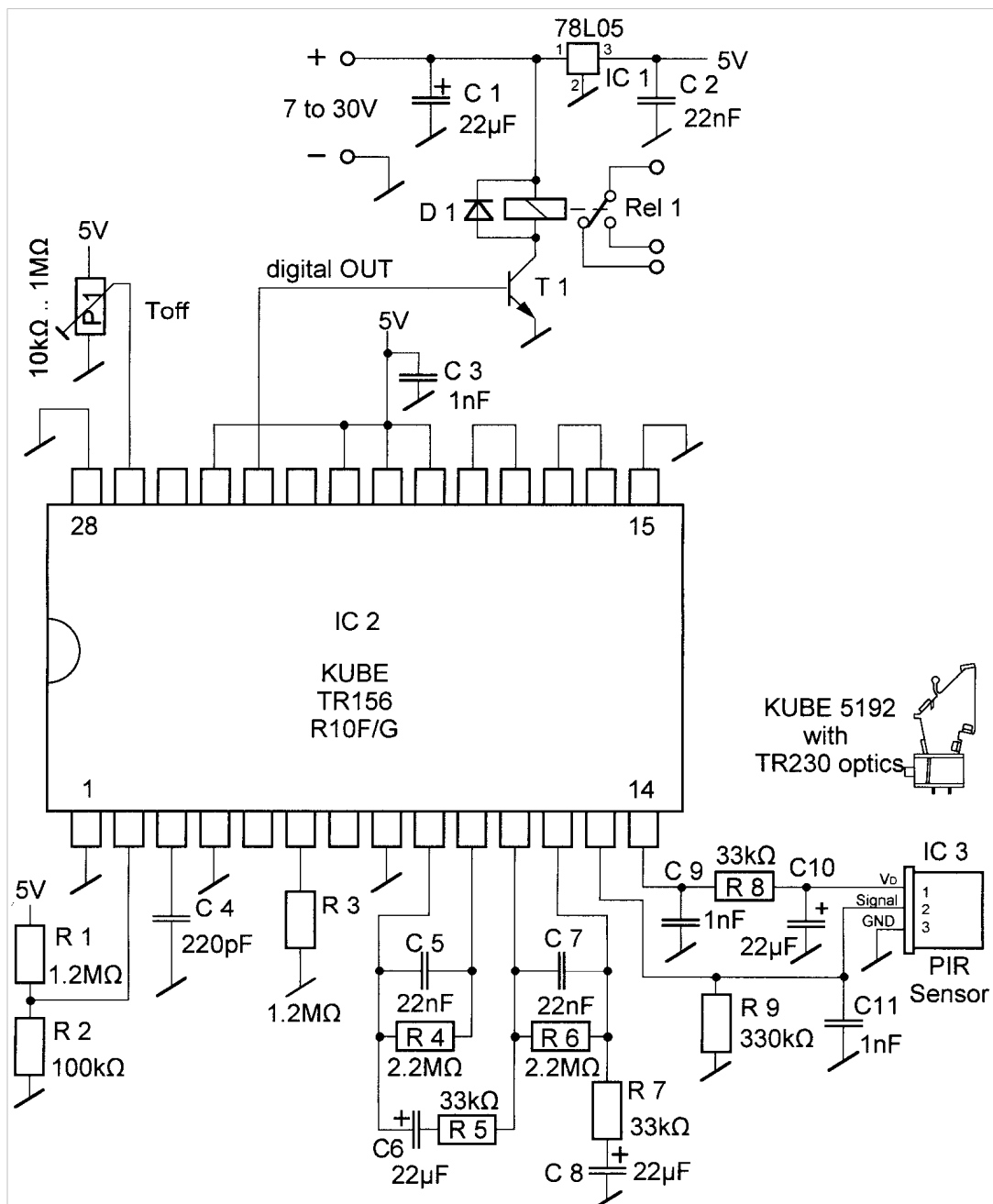


For power relays, output pin 24 provides PWM modulation to reduce current drain. This mode is switched on automatically when a transistor is driven by the output, i.e. the output is not allowed to rise above 2 volts. The output is also available as inversed (Pin 7). There is a "presence" output (Pin 23) independent of the time settings, for an LED (integral current source 0.5 mA) to visualize that the detector works. This LED is delayed by 5 seconds to the sensor activation, so that a person can observe the unit switching on.

**Start up functions:**

The circuit is resetted when powered and in an initial ON state until operational (for appx. 20 sec.).

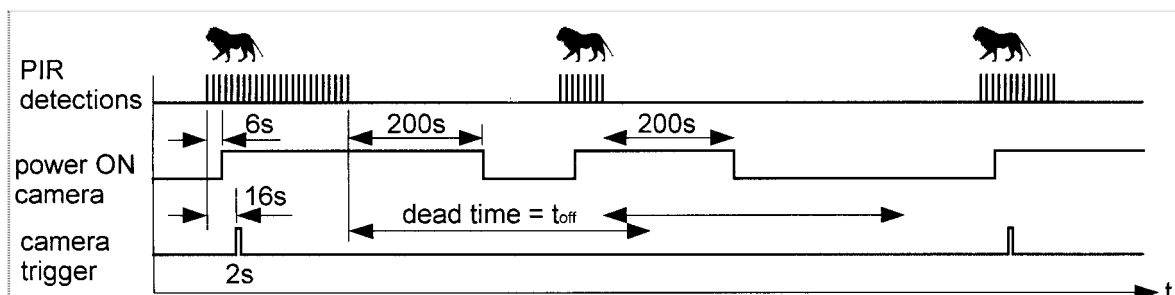
**Schematic:**



### 3 Game Camera Control

This circuit provides the basic functions and timers to control a conventional or digital camera.

The power supply output allows powering up digital cameras. The camera trigger output delivers a 1 second pulse when motion is detected for more than 16 seconds ( $T_{on}$ ). After each trigger, there is a dead time ( $T_{off}$ ) to prevent that too many pictures are taken when the animal continues to move in front of the camera. This dead time can be set from 24 to 512 seconds with the potentiometer P1.



#### Features:

- Supply voltage 6 to 12 Volts. Use 6V lead-acid gel battery, 4 alkaline cells or 5 NiCd cells. Battery voltage must not drop below 6.0 Volts for proper operation.
- Current requirement 0.6mA . Will run 10'000 hrs with four D-size cells
- $T_{on}$  = fixed at 16 seconds (prevents triggering by single events such as lightning, falling branches etc.)
- $T_{off}$  = 24 to 512 seconds
- Photoresistor (LDR) allows day-only and night-only or 24 hour settings (switch S1)
- Short circuit proof power FET outputs to drive camera. FET's Q1 and Q2 may be replaced by relays (use arrangement as in circuit A above) when isolated outputs are required.
- A first camera trigger output occurs when the circuit is powered.
- PIR sensor sensitivity can be altered with a switch S2 if required.

For more information, refer to the datasheet on [www.kube.ch/circuit\\_ic/index.php](http://www.kube.ch/circuit_ic/index.php)



Schematic:

