watchgas
detection

USER MANUAL

# BEACON SOUNDER

we watch gas where you can't

# CONTENTS

# DESCRIPTION

The Beacon sounder has 38 Ultra Bright, RGB LEDs with 360° visibility and Piëzo sounder, 106 dB at 30 cm. The visual and audible modes can be used independently or combined in any required combination by analog or digital trigger.

**IMPORTANT:** This user manual contains important information regarding the operation of the beacon sounder. Ensure you read this user manual fully before installing and operating the beacon sounder. If you are installing this beacon sounder for use by others, you must leave this manual with the end user. Installation must be carried out, in accordance with latest codes and regulations, by a qualified electrician.

# ⚠ WARNING

- Ensure power source is disconnected prior to installation or maintenance to avoid damage to the beacon sounder or electric shock.
- Do not handle internal electronical components whilst wiring up. Environmental exposure during installation should be under dry circumstances, avoid heavy moist and wet conditions. The beacon sounder is only weatherproof to IP65 when mounted upright.
- Use M4 screws, washers and nuts (4 pieces supplied) to secure beacon to its mounting. Do not mount the beacon sounder on places with excessive vibrations.
- Do not use solvents or cleaners on the beacon sounder, as they may cause damage to the beacon lens or circuitry. The unit can be wiped with a slightly damp cloth.

# DISPOSAL

The beacon sounder should not be disposed with your other household waste. The beacon sounder is ideally suited for disposal within the waste electronic and electrical equipment (WEEE) recycling scheme. Check at your local authority, retailer or contact our technical support team for recycling / disposal advice as regional variations apply. You may return the unit to us for safe dismantling and disposal.

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# 1. PRODUCT OVERVIEW
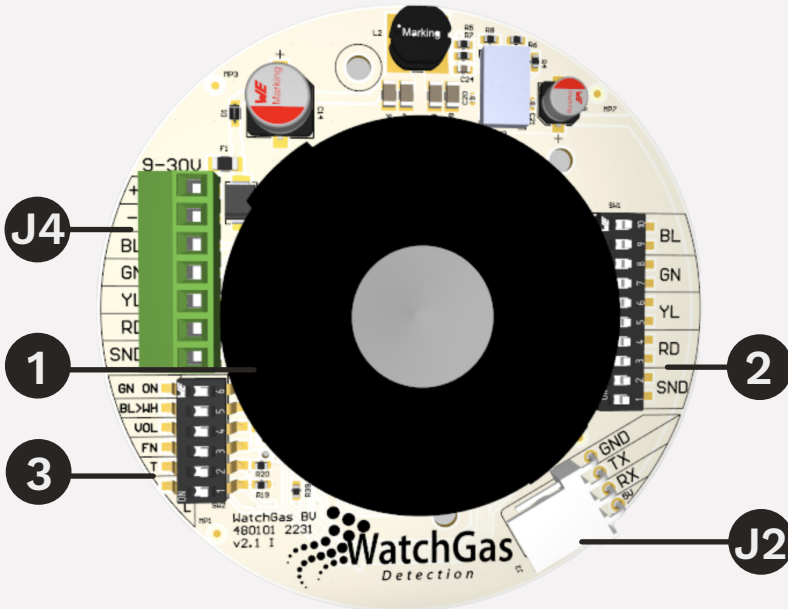


## 1.1 PCB LAYOUT

1. **Sounder**
2. **10 pin DIP switch**
3. **6 pin DIP switch**
**J2. Communication input**
**J4. Terminal block 7 pins**
+ = Supply
− = Ground
BU = Blue light
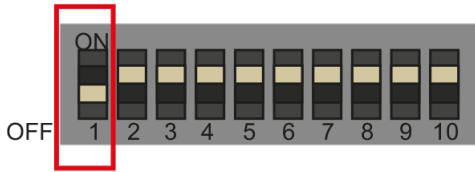GN = Green light
YL = Yellow light
RD = Red light
SND = Sounder

| POWER SUPPLY | 9-30V DC (min. 4W) |
|---|---|
| STAND-BY CURRENT | max 10mA |
| TRIGGER VOLTAGE POSITIVE | 6-30V DC |
| TRIGGER CURRENT | max 6mA |
| CABLE DIAMETER | max 1.3mm$^2$ Stranded core |

## 1.2 DRILLING TEMPLATE
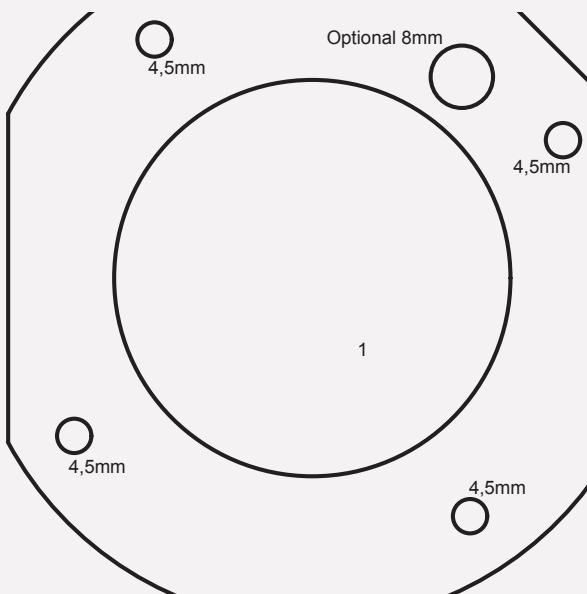


Drilling Template Scale 1/1

# 2. DIP SWITCH SETTINGS

## DIP SWITCH 1 / 2 SOUND SELECTION
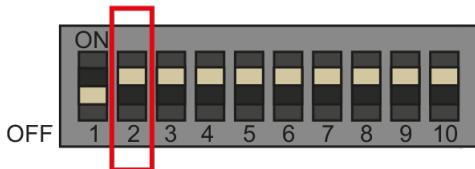
alternating low / high beeps

continuous 50 Hz

changing frequency fast

continuous 2700 Hz

## DIP SWITCH 3 / 4 RED LIGHT

continuous

fancy loop

looping

flashing 10 Hz / 50% duty cycle

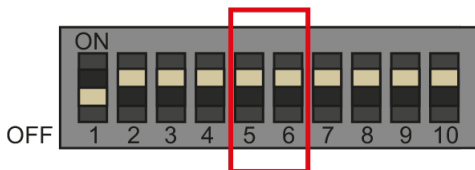## DIP SWITCH 5 / 6 YELLOW LIGHT

continuous

fancy loop

looping

flashing 10 Hz / 50% duty cycle

## DIP SWITCH 7 / 8 GREEN LIGHT

continuous

fancy loop

looping

flashing 10 Hz / 50% duty cycle

## DIP SWITCH 9 / 10 BLUE / WHITE LIGHT

continuous

fancy loop

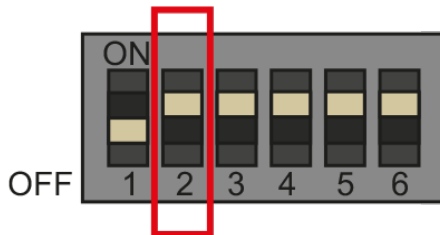looping

flashing 10 Hz / 50% duty cycle

# BEACON SOUNDER

## DIP SWITCH 1 L

Link red and Sounder analog inputs
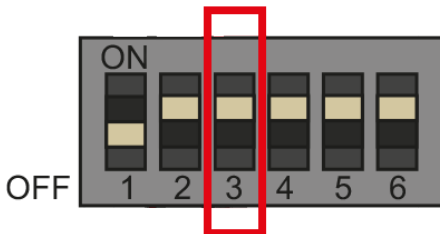
ON = Linked
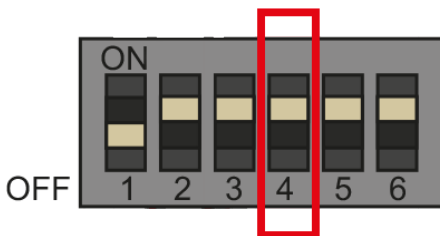OFF = Unlinked

## DIP SWITCH 2 T

Trigger

ON = Rising trigger
OFF = Falling trigger

## DIP SWITCH 3 FN

Function

ON = J2 TTL Communication protocol
OFF = J4 terminal block input

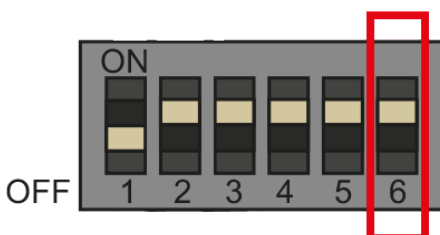## DIP SWITCH 4 VOL

Volume

ON = Low
OFF = High

## DIP SWITCH 5 BL>WH

Swap blue to white

ON = Active
OFF = Not active

## DIP SWITCH 6 GN ON

Green always on

ON = Active
OFF = Not active

# 3. MOUNTING INSTRUCTIONS

- Use drilling template to make holes in the mounting surface.
- Mount the beacon sounder with the supplied screws, washers and nuts.
- Always mount with the glass upright.
- Ensure all rubber gaskets are placed correctly.
- Insert Supply/signal cable through the 5,5mm hole (see drilling template)
- Connect supply/signal cable to the terminal block



Transparent lens

O-ring lens

Screws

Gasket
Washer
Nut
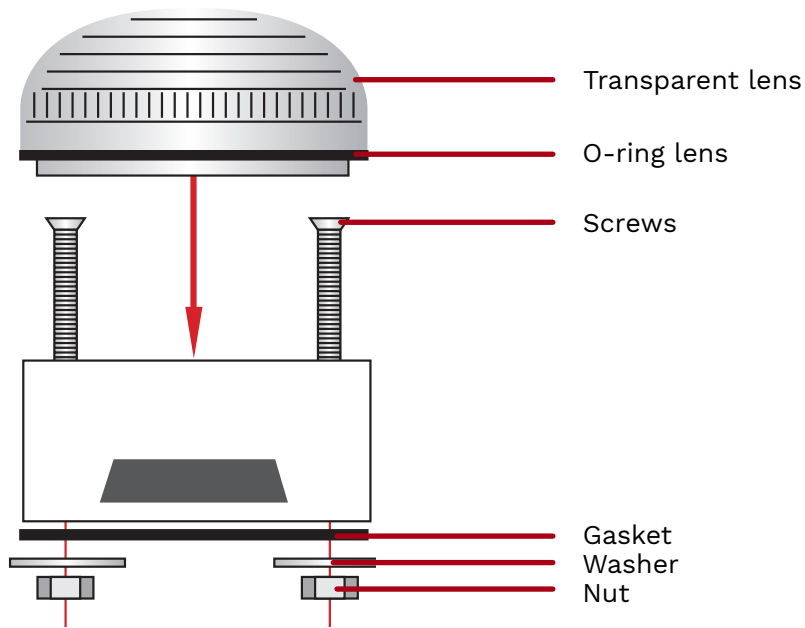
# CAUTION

Only mount in upright position as shown.

## CONNECTION EXAMPLE NORMAL TRIGGER
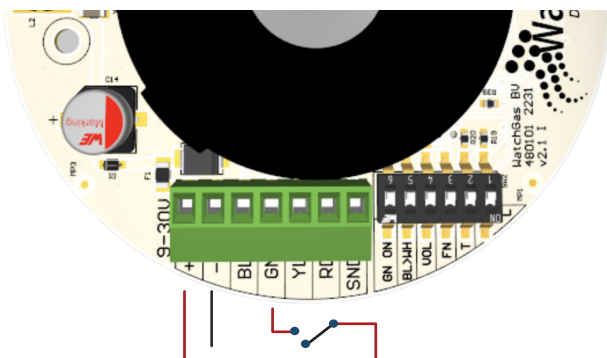


## CONNECTION EXAMPLE INVERTED TRIGGER

# 4. GENERAL SPECIFICATIONS

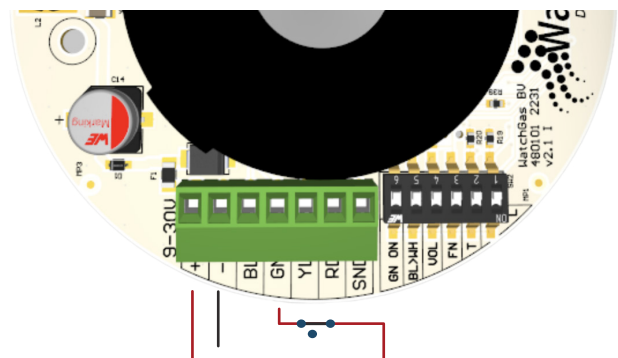| DIMENSIONS | 92 x 83 mm (3.6 x 3.3") Dia x H |
|---|---|
| WEIGHT | 250 g (8.82 oz) |
| MOUNTING | 4x M4x35 bolts |
| COLORS | RGB LED, Red, Yellow, Green and Blue flashing patterns |
| SOUND | 4 types of alarm sounds |
| SOUND PRESSURE LEVEL | 106 dB @ 30 cm |
| POWER SUPPLY | 9-30V DC (min. 4W) |
| STANDBY CURRENT | Max. 10 mA |
| TRIGGER VOLTAGE POSITIVE | 6-30V DC |
| TRIGGER CURRENT | Max. 6 mA |
| CABLE DIAMETER | Max. 1,3 mm$^2$ Stranded core |

# 5. SERIAL PROTOCOL SPECIFICATION
Specification rev 1.0

## INTRODUCTION

This document describes how to control and connect the Beacon Sounder PN: Air-Be-ac-010 over a serial interface. This serial interface can be used to select colour, display effect and sound effect. If the serial input is used, the digital I/O inputs are no longer enabled. The document contains source code that can be used as an example of how to send commands to the beacon sounder.

## CONNECTIONS
## WIRING

The beacon sounder can be powered by **only one** of these options:
1. Use terminal J4 connect 9 – 30VDC (min 10W) to the + and – terminals
2. Use terminal J2 to connect a 5VDC (+/- 0.1V) 2A power supply. This input has no protection against overvoltage or supply reversal. Use at your own risk.
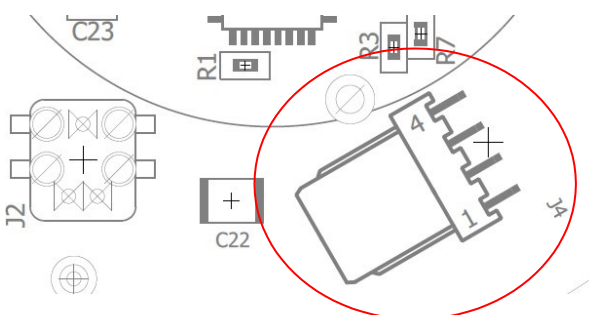


| J2 PINOUT | |
|---|---|
| **PIN** | **CONNECTION** |
| 1 | + 5VDC Power supply |
| 2 | TX Signal |
| 3 | Do not use |
| 4 | GND |

## NOTE

Cable length of TX signal may not exceed 500mm wire distance form signal source.

The signal voltage should be 3.3V TTL/CMOS.

## CONNECTOR & CRIMP

| DESCRIPTION | PART NUMBER | MANUFACTURER |
|---|---|---|
| WIRE-TO-BOARD RECEPTACLE | 22-01-2045 | Molex |
| CRIMP CONTACT GOLD PLATED | 08-55-0111 | Molex |

## DIPSWITCH SETTING

Set DIP switch FN 3 to "ON" to configure the beacon sounder to use a serial input.
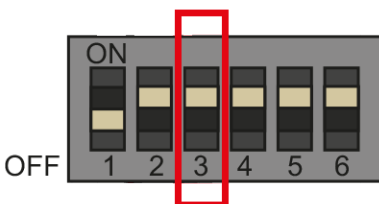


### DIP SWITCH 3 FN

Function

ON = J2 TTL Communication protocol
OFF = J4 terminal block input

## PROTOCOL
## SPECIFICATION FOR COMMUNICATION

| ITEM | VALUE |
|---|---|
| BAUD RATE | 9600 8N1 |
| FLOW CONTROL | None |
| SIGNALING VOLTAGE | 3.3 |

# BEACON SOUNDER

## FORMAT

The serial commands consist of a 7 byte string with the following layout.

| BYTE | FORMAT | DESCRIPTION |
|------|--------|-------------|
| 0 | ASCII 'X' | Synchronization character |
| 1 | ASCII Hex | Display mode |
| 2 | ASCII Hex | Red |
| 3 | ASCII Hex | Green |
| 4 | ASCII Hex | Blue |
| 5 | ASCII Hex | Sound mode |
| 6 | ASCII Hex | CRC |

All ASCII Hex values are a single value ranging from 0 to F.

## NOTE

This command has to be repeated at least every 15 seconds. If no command has been received for 15 seconds, the beacon sounder will switch off.

The CRC byte is calculated as following:
**crcByte = toHex ( (Byte[0] + … + Byte[5]) & 0xF );**

# LIGHT AND SOUND MODES

The following sound and light modes are implemented:

| VALUE | SOUND MODE (BYTE 5) | LIGHT MODE (BYTE 1) |
|-------|---------------------|---------------------|
| 0 | Disabled | Flashing 10Hz 50% duty |
| 1 | Continuous 2700Hz low | Looping |
| 2 | Changing frequency (fast) low | Fancy looping |
| 3 | Changing frequency (slow) low | Continuously on |
| 4 | Alternating low / high beeps low | Low power rotation effect |
| 5 | Continuous 50Hz low | Flashing 2Hz 10% duty |
| 6 | Reserved | Reserved |
| 7 | Reserved | Reserved |
| 8 | Disabled | Reserved |
| 9 | Continuous 2700Hz high | Reserved |
| A | Changing frequency (fast) high | Reserved |
| B | Changing frequency (slow) high | Reserved |
| C | Alternating low/high beeps high | Reserved |
| D | Continuous 50Hz high | Reserved |
| E | Reserved | Reserved |
| F | Reserved | Reserved |

## EXAMPLE CODE

The following C code can be used to implement this protocol.

```c
// Range for r,g,b is 0 .. 255.
// Run this function every 5 .. 10 seconds
void set(BSoundMode s, BLightMode m, uint8_t r, uint8_t g, uint8_t b) {

        // Transmit new values
        char cmd[9];
        cmd[0] = 'X';
        cmd[1] = toHex(m);
        cmd[2] = toHex(r >> 4);
        cmd[3] = toHex(g >> 4);
        cmd[4] = toHex(b >> 4);
        cmd[5] = toHex(s);
        cmd[6] = toHex( (cmd[0] + cmd[1] + cmd[2] + cmd[3] + cmd[4] + cmd[5]) &
        0xF);
        cmd[7] = '\r';
        cmd[8] = 0;

        // Transmit
        printf((const char*) cmd);

}

char toHex(uint8_t x) {
        if (x < 10)
                return '0' + x;
        else if (x < 16)
                return 'A' + x - 10;
        else
                return '?';
}

enum BSoundMode {BS_OFF = 0, BS_CONTINUOUS_2K7 = 1, BS_LINEAR_2K7_FAST = 2, BS_
LINEAR_2K7_SLOW = 3, BS_SMALLBEEPS = 4};
enum BLightMode { BS_FAST = 0, BS_SLOW = 1, BS_LOOP = 2, BS_ON = 3, BS_TINYFLASH = 4,
BS_FULLFLASH = 5};
```

# 6. LIMITED WARRANTY

WATCHGAS warrants this product to be free of defects in workmanship and materials-under normal use and service-for two years from the date of purchase from the manufacturer or from the product's authorized reseller.

The manufacturer is not liable (under this warranty) if its testing and examination disclose that the alleged defect in the product does not exist or was caused by the purchaser's (or any third party's) misuse, neglect, or improper installation, testing, or calibrations. Any unauthorized attempt to repair or modify the product, or any other cause of damage beyond the range of the intended use, including damage by fire, lightening, water damage or other hazard, voids liability of the manufacturer.

In the event that a product should fail to perform up to manufacturer specifications during the applicable warranty period, please contact the product's authorized reseller or WATCHGAS service center at www.watchgas.com for repair/return information.

FOR MORE INFORMATION
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