Product Manual
ROLP Sounder

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Introduction

The ROLP sounder is an affordable wall mounting sounder which is suitable for audible signalling within open areas or corridors and passages. The sounder is designed for use within fire alarm systems, intruder alarm systems and industrial signalling systems. It is able to produce 32 tones via the coding switch on the rear of the unit (see installation sheet/tones table for more detail). A second tone can be activated remotely by using the third terminal. A volume control adjustment is also provided.

Connection is via a screw terminal connector block for ease of termination of cables. Each connection has a terminal for looping in and out. The sounder is fixed to a location using a bespoke shallow clip on lockable base.

General Functional Description

The device is normally in an off state, with no voltage applied to the power terminals. In this state, the unit has no power and so does not produce any sound.

When the unit is required to produce sound, a voltage between 9 and 15 D.C. or 18-28V DC is applied to the appropriate power terminals. This provides power to the circuit via a polarity protection diode, & an RC network which provides supply smoothing and noise immunity protection. Further protection is also provided against voltage spikes on the supply. At the heart of the sounder is a microprocessor which derives its power from a linear voltage regulator circuit. Clock timing and sounder synchronisation is provided via the oscillator clock drive crystal & associated capacitor network.

The tone generated by the microprocessor depends on the tone switch settings. After power up and initialisation, the firmware code starts executing the relevant pulse output from the microprocessor. This drives a transistor circuit which in turn drives a push/pull amplifier arrangement which drives the loudspeaker circuit.

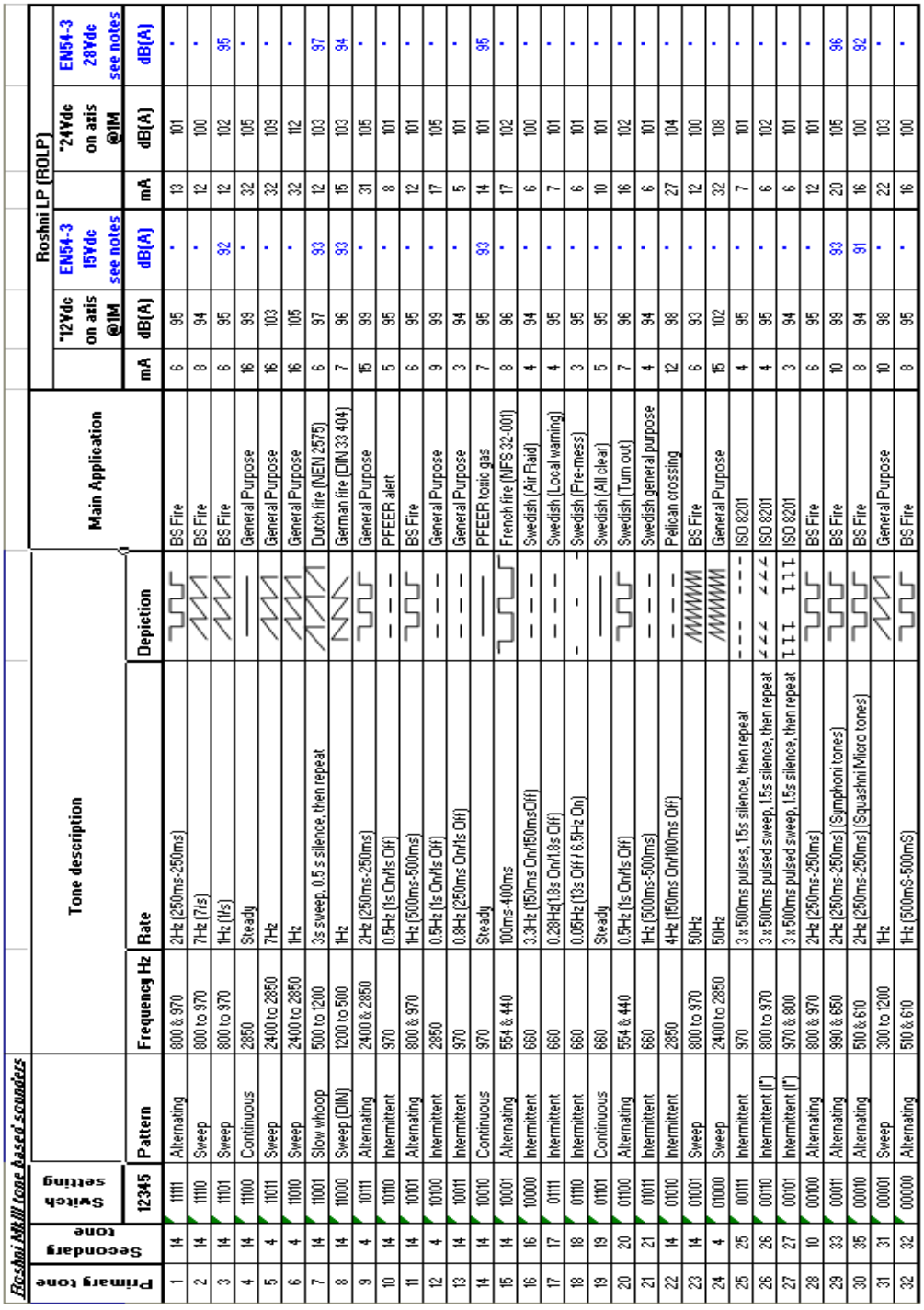
Some adjustment of the output sound level can be achieved using the volume control adjustment (if provided), which reduces the current drive to the transducer.

If the user wishes to select a second tone remotely, the additional connection on the terminal block is taken to ground (i.e. -ve supply to "2nd TONE -" terminal). This sets the microprocessor firmware to generate a different tone.

Notes:

- See Installation sheet for details on technical specifications, connection instructions & mounting arrangements.

Tones Table



Roshni MkIII tone based sounders									Roshni LP (ROLP)					
Primary tone	Secondary tone	Switch setting	Tone description				Main Application		mA	"12Vdc on axis @1M dB(A)	EN54-3 15Vdc see notes dB(A)	mA	"24Vdc on axis @1M dB(A)	EN54-3 28Vdc see notes dB(A)
		12345	Pattern	Frequency Hz	Rate	Depiction								
1	14	11111	Alternating	800 & 970	2Hz (250ms-250ms)		BS Fire		6	95	-	13	101	-
2	14	11110	Sweep	800 to 970	7Hz (71s)		BS Fire		8	94	-	12	100	-
3	14	11101	Sweep	800 to 970	1Hz (1s)		BS Fire		6	95	92	12	102	95
4	14	11100	Continuous	2850	Steady		General Purpose		16	99	-	32	105	-
5	4	11011	Sweep	2400 to 2850	7Hz		General Purpose		16	103	-	32	109	-
6	4	11010	Sweep	2400 to 2850	1Hz		General Purpose		16	105	-	32	112	-
7	14	11001	Slow whoop	500 to 1200	3s sweep, 0.5 s silence, then repeat		Dutch fire (NEN 2575)		6	97	93	12	103	97
8	14	11000	Sweep (DIN)	1200 to 500	1Hz		German fire (DIN 33 404)		7	96	93	15	103	94
9	4	10111	Alternating	2400 & 2850	2Hz (250ms-250ms)		General Purpose		15	99	-	31	105	-
10	14	10110	Intermittent	970	0.5Hz (1s On/1s Off)		PFEER alert		5	95	-	8	101	-
11	14	10101	Alternating	800 & 970	1Hz (500ms-500ms)		BS Fire		6	95	-	12	101	-
12	4	10100	Intermittent	2850	0.5Hz (1s On/1s Off)		General Purpose		9	99	-	17	105	-
13	14	10011	Intermittent	970	0.8Hz (250ms On/1s Off)		General Purpose		3	94	-	5	101	-
14	14	10010	Continuous	970	Steady		PFEER toxic gas		7	95	93	14	101	95
15	14	10001	Alternating	554 & 440	100ms-400ms		French fire (MFS 32-001)		8	96	-	17	102	-
16	16	10000	Intermittent	660	3.3Hz (150ms On/150msOff)		Swedish (Air Raid)		4	94	-	6	100	-
17	17	01111	Intermittent	660	0.28Hz(1.8s On/1.8s Off)		Swedish (Local warning)		4	95	-	7	101	-
18	18	01110	Intermittent	660	0.05Hz (13s Off / 6.5Hz On)		Swedish (Pre-mess)		3	95	-	6	101	-
19	19	01101	Continuous	660	Steady		Swedish (All clear)		5	95	-	10	101	-
20	20	01100	Alternating	554 & 440	0.5Hz (1s On/1s Off)		Swedish (Turn out)		7	96	-	16	102	-
21	21	01011	Intermittent	660	1Hz (500ms-500ms)		Swedish general purpose		4	94	-	6	101	-
22	14	01010	Intermittent	2850	4Hz (150ms On/100ms Off)		Pelican crossing		12	98	-	27	104	-
23	14	01001	Sweep	800 to 970	50Hz		BS Fire		6	93	-	12	100	-
24	4	01000	Sweep	2400 to 2850	50Hz		General Purpose		15	102	-	32	108	-
25	25	00111	Intermittent	970	3 x 500ms pulses, 1.5s silence, then repeat		ISO 8201		4	95	-	7	101	-
26	26	00110	Intermittent (!")	800 to 970	3 x 500ms pulsed sweep, 1.5s silence, then repeat		ISO 8201		4	95	-	6	102	-
27	27	00101	Intermittent (!")	970 & 800	3 x 500ms pulsed sweep, 1.5s silence, then repeat		ISO 8201		3	94	-	6	101	-
28	10	00100	Alternating	800 & 970	2Hz (250ms-250ms)		BS Fire		6	95	-	12	101	-
29	33	00011	Alternating	980 & 650	2Hz (250ms-250ms) (Symphoni tones)		BS Fire		10	99	93	20	105	96
30	35	00010	Alternating	510 & 610	2Hz (250ms-250ms) (Squashni Micro tones)		BS Fire		8	94	91	16	100	92
31	31	00001	Sweep	300 to 1200	1Hz		General Purpose		10	88	-	22	103	-
32	32	00000	Alternating	510 & 610	1Hz (500mS-500mS)		BS Fire		8	95	-	16	100	-

Note (a): Tones approved under the Construction Products Directive for Fire Alarm Applications, are shown in the column marked EN54-3.
Note (b): EN54-3 measurements shown reflect minimum expected SPL readings at Maximum Volume at the Loudest Point around the EN54-3 defined sounder axis.
Note (c): All other tone measurements reflect mean manufacturers data based on 'on axis' measurements, and are not verified by a Notified body.
Note (d): Detailed EN54-3 polar SPL measurements are available in this Product Manual.
Note (e): All measurements taken at 20°C operating temperature.
Note (f): For SPL figures at 12V DC, take 6dB of the readings for 24V DC.

Directional Output Variation
The tables below show the sounders SPL in accordance with EN54-3.

Operational Performance – Tone 3.

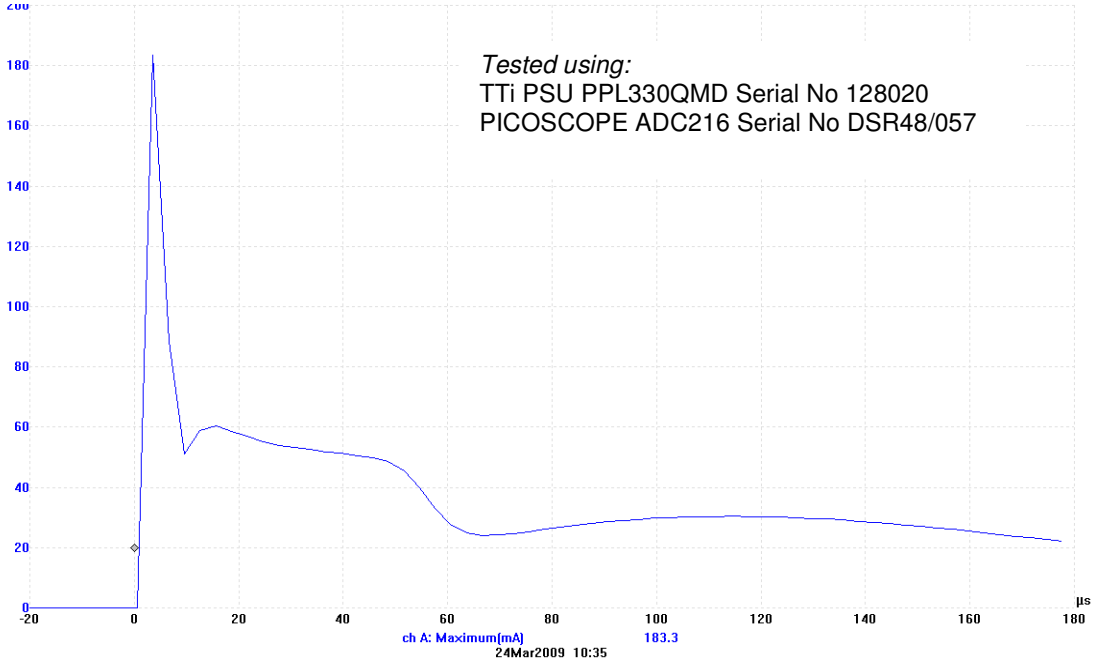
Operational performance Specimen №1						
Maximum Volume dB(A)						
Angle	Horizontal Plane			Vertical Plane		
	Min dB 9.0V	Max dB 15.0V	Difference dB	Min dB 9.0V	Max dB 15.0V	Difference dB
15°	80	84	<6	79	84	<6
45°	79	83	<6	80	85	<6
75°	89	93	<6	89	94	<6
105°	88	93	<6	88	93	<6
145°	78	82	<6	77	82	<6
165°	78	82	<6	80	85	<6

Operational performance Specimen №1						
Maximum Volume dB(A)						
Angle	Horizontal Plane			Vertical Plane		
	Min 9.0V	Max 15.0V	Difference	Min 9.0V	Max 15.0V	Difference
15°	80	85	<6	81	86	<6
45°	78	84	<6	81	86	<6
75°	89	94	<6	90	95	<6
105°	89	94	<6	89	94	<6
145°	79	84	<6	78	83	<6
165°	80	85	<6	81	86	<6

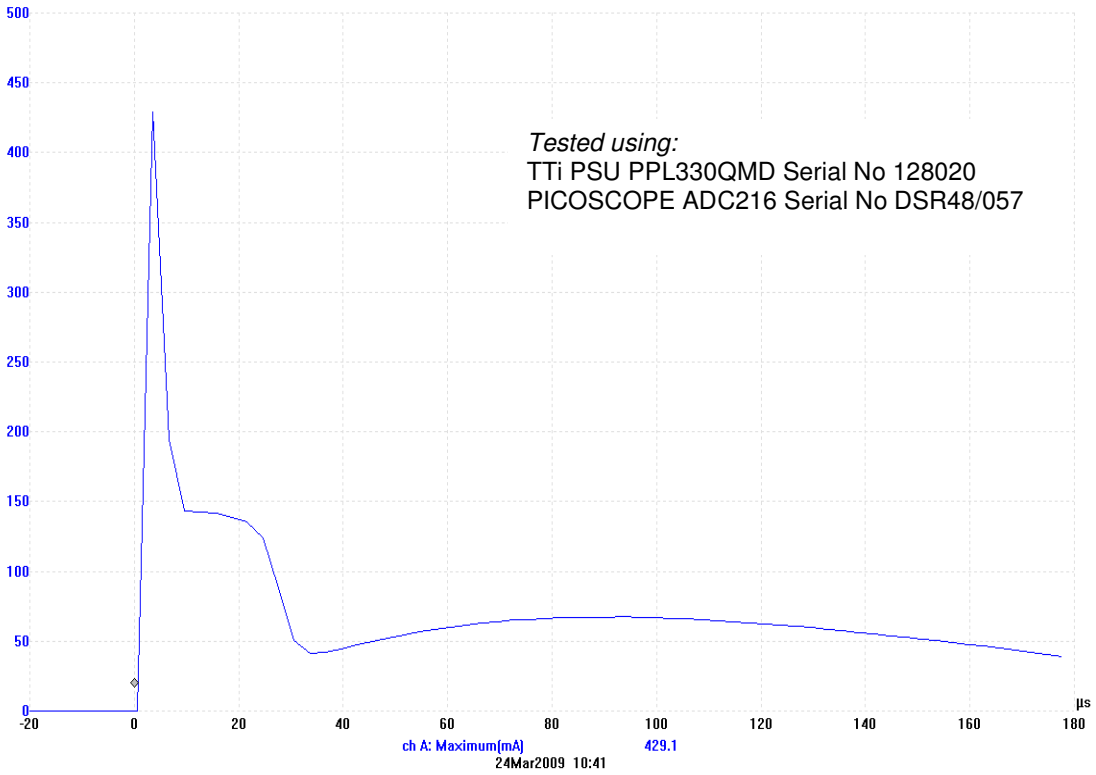
Operational performance Specimen №1						
Maximum Volume dB(A)						
Angle	Horizontal Plane			Vertical Plane		
	Min 9.0V	Max 15.0V	Difference	Min 9.0V	Max 15.0V	Difference
15°	80	85	<6	81	86	<6
45°	79	84	<6	80	85	<6
75°	89	94	<6	89	94	<6
105°	89	94	<6	88	93	<6
145°	79	84	<6	77	82	<6
165°	80	85	<6	81	86	<6

Operational performance Specimen №1						
Maximum Volume dB(A)						
Angle	Horizontal Plane			Vertical Plane		
	Min 9.0V	Max 15.0V	Difference	Min 9.0V	Max 15.0V	Difference
15°	79	84	<6	78	83	<6
45°	75	80	<6	79	84	<6
75°	88	93	<6	89	94	<6
105°	88	93	<6	88	93	<6
145°	76	81	<6	76	81	<6
165°	77	82	<6	80	85	<6

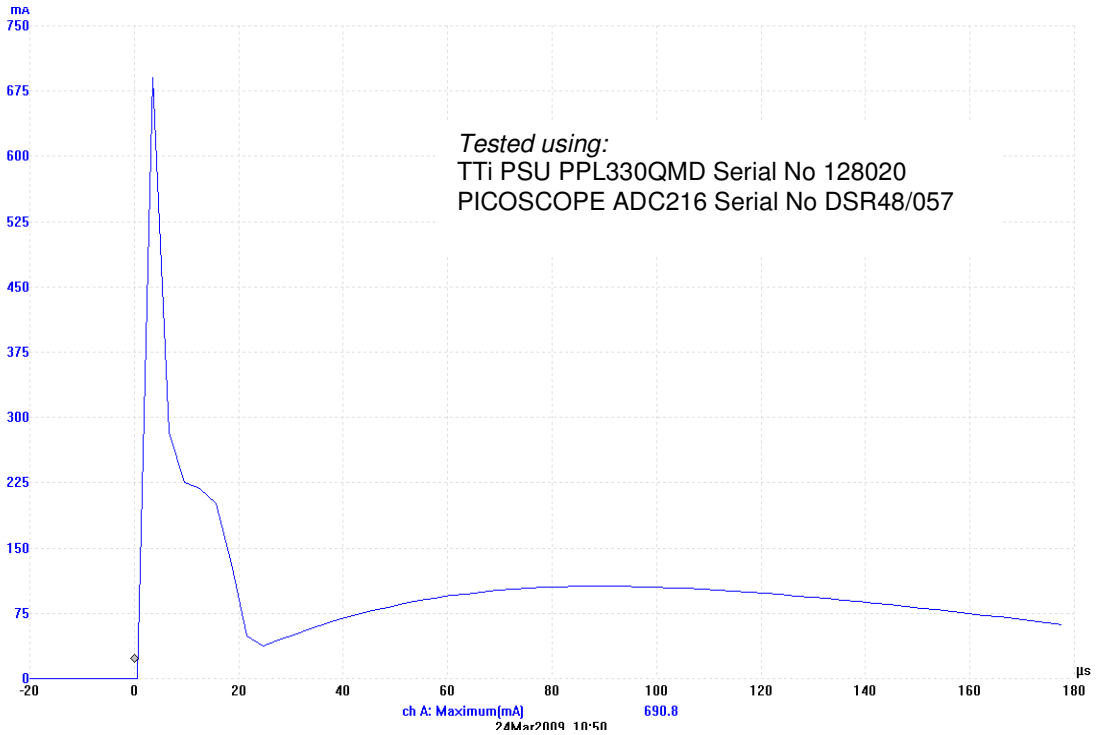
ROLP: Start Up Current at 9 volts



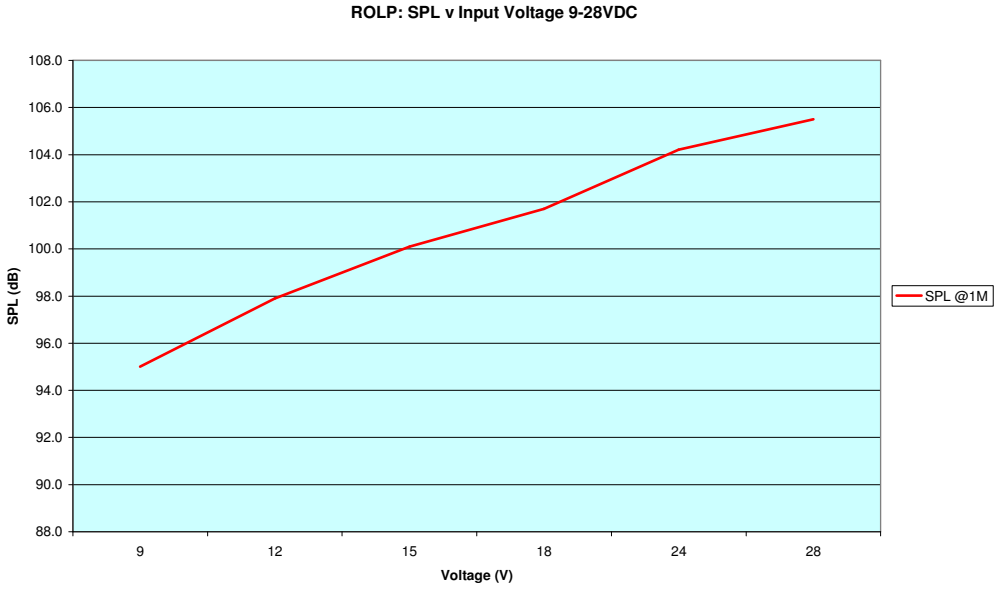
ROLP: Start Up Current at 18 volts



ROLP: Start Up Current at 28 volts

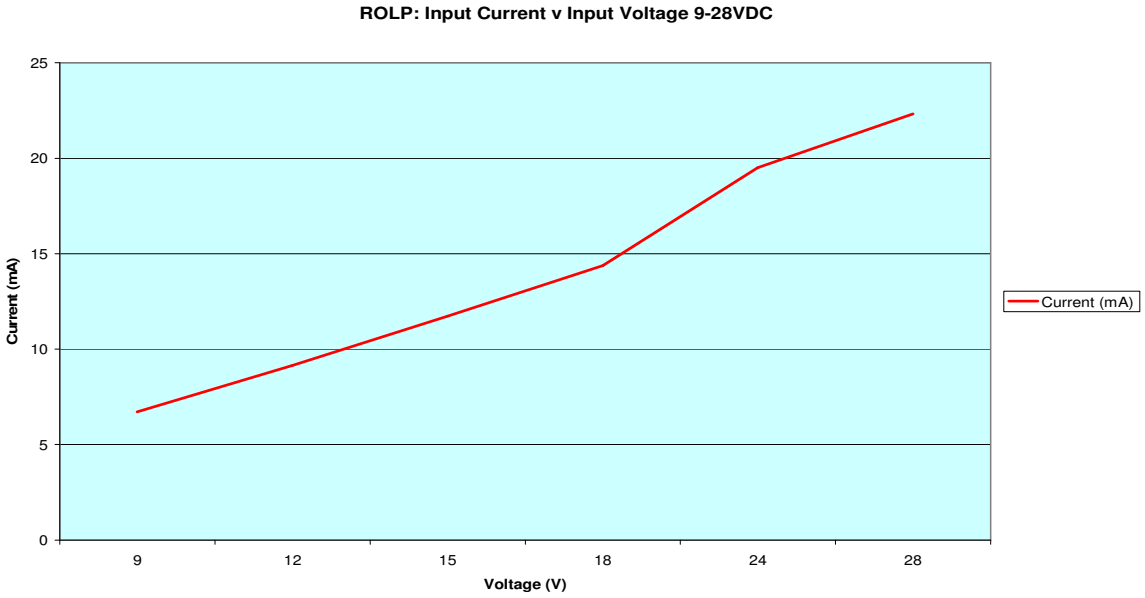


ROLP: SPL v Input Voltage 9 – 28V_{DC}



ROLP: SPL v Input Voltage 9 – 28VDC						
Voltage	9	12	15	18	24	28
SPL @1M	95.0	97.9	100.1	101.7	104.2	105.5
SPL @ 2M	92.0	94.9	97.1	98.7	101.2	102.5

ROLP: Input Current v Input Voltage 9 – 30V_{DC}



ROLP: Input Current v Input Voltage 9 – 28VDC						
Voltage	9	12	15	18	24	28
Current (mA)	6.72	9.14	11.73	14.38	19.51	22.33

Installation Guidance & Advise

General Safety Advice

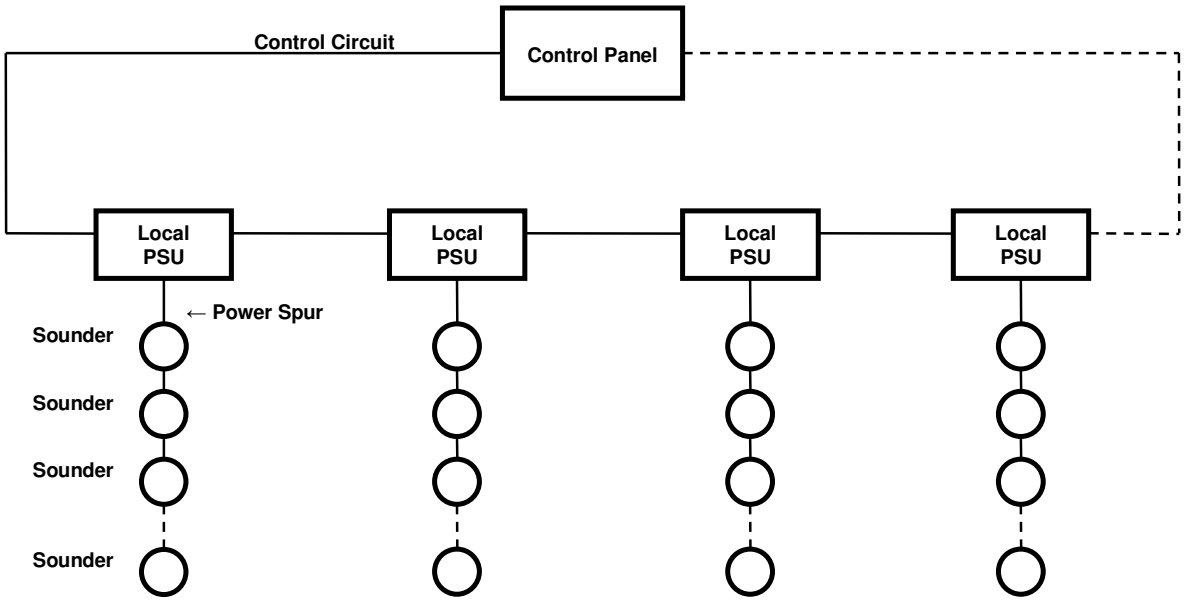
- ***Do not work on live circuits***
- ***Follow local wiring regulations where relevant***
- ***Ensure that the base is secured to the mounting surface using the most appropriate fixings. Plasterboard walls will require special wall plugs.***

Maintaining IP (Ingress Protection) ratings – Good Practice

- ***Use suitable cable glands to maintain the designed IP rating. The stated product rating will ONLY be achieved if the product is installed correctly. A selection of suitable glands is available from all good electrical wholesalers. Always follow the cable gland instructions.***
- ***Product orientation is important. If it is desired to achieve a high weatherproof rating, all cables should be brought in and out from the underside of the device. Avoid cable entry from the top side, as water could drain in over time.***
- ***Ensuring that all base and mounting screws are secure.***

Power Supplies / Control Panels

- **Use a power supply or control panel capable of providing a steady state current of at least 1.2 x the rated operating current of each device.**
- **Use a power supply or control panel capable of providing a surge current of at least 1.5 x the surge current of each device for at least 10mS.**
- **A suitable slow-blow fuse must be fitted to the output stage of all power supplies, to help prevent fuse blowing during power up.**
- **Where a large number of units are to be wired, it is recommended to use multiple power supplies on separate spurs or loops to avoid the huge voltage drops that would otherwise be encountered. See diagram below: -**

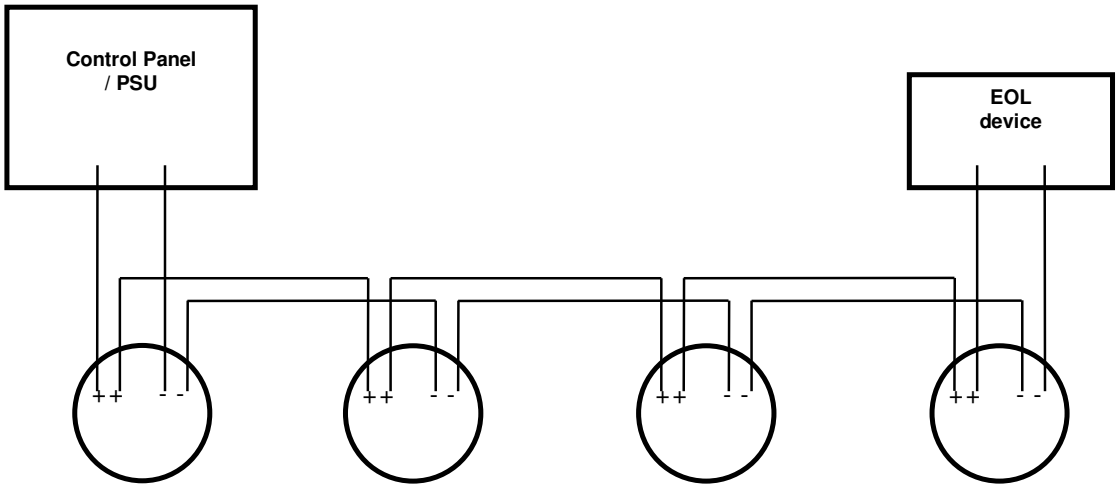


Wiring

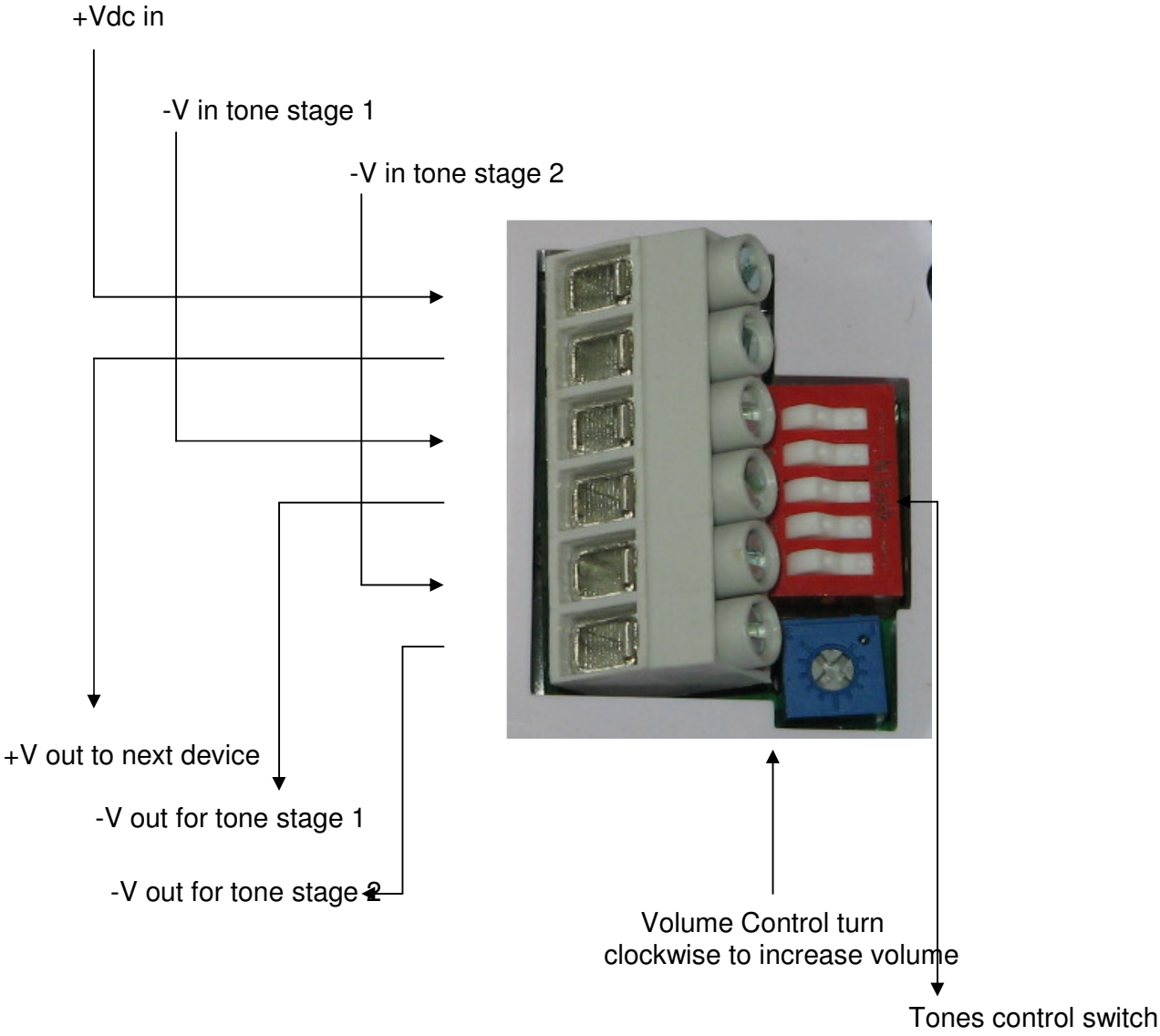
It is essential to know the series resistance of the cable before making a choice here. It is recommended that the thickest wire possible is used. This ensures that the series resistance is minimised and thus the length of the wiring that can be used is maximised. All the measurements and calculations shown on the following pages are for a maximum solid core wire cross sectional area (CSA) of 2.5mm^2. If using a different cable type, CSA or a material other than copper is used the value of the series resistance of the cable (R_s) will need to be adjusted in the formula below.

Please note that that all calculations here are for spurs only. It is risky to do calculations on loops, since if one side of a loop were to fail, the maximum equivalent series resistance could double. This may result in possible system start up problems or poor performance issue due to excessive voltage drops.

Typical Wiring Configuration



ROLP Wiring Instruction details



Typical Calculations (ROLP for example purposes ONLY)

No. of products (N)	Typical max current consumption of product (Is) - Amps	Typical power supply steady state capability (Ip) - Amps	Max cable resistance for 10% voltage drop @ $10V_{DC}$ (Rc) - ohms	Max cable length for 10% voltage drop @ $11.2V_{DC}$ (L) - Meters
1	0.033	0.04	[a] 25	[b] 7142
2	0.066	0.08	12.5	3571
3	0.099	0.12	8.3	2371
4	0.132	0.16	6.3	1800
5	0.165	0.20	5	1428

- ✓ **Recommendations & Assumptions:**
  - **Copper wire with core cross sectional area (CSA) of 2.5mm^2 is assumed to be used**
  - **R_S (Maximum series resistance of copper wire) = 0.7ohm per 100meters (typical)**
  - **Power supplies must be capable of delivering surge currents of 1.5x surge current of each device for at least 10mS**
  - **All sounders are assumed to be wired to the end of a spur (i.e. worst case scenario)**
  - **Where the length of cable or number of sounders used becomes an issue, it is recommended to group units together and use a separate power supply & wiring spur for each group**

- ✓ **Formulae:**
  - **Cable Resistance:** $R_c = V_{drop} / I_s$ (where Vdrop = 10 x 10%)
    $= 1V / I_s$
    $= 1V / 0.04 = 25$ ohm [a]
  - **Cable Length:** $L = R_c / [R_s /(100 \times 2)]$ (assumes feed / return (+/-) wires are same length & diameter)
    $= R_c / 0.0035$ ohm
    $= 25$ ohm / 0.0035 ohm = 7142 meters [b]

*** Note: All calculations and advice given is for guidance ONLY. No liability is assumed by the manufacture for the use of these calculations, or for any errors or omissions. The installer is responsible for ensuring that the product is installed correctly and safely using all relevant & current wiring regulations & practices.**

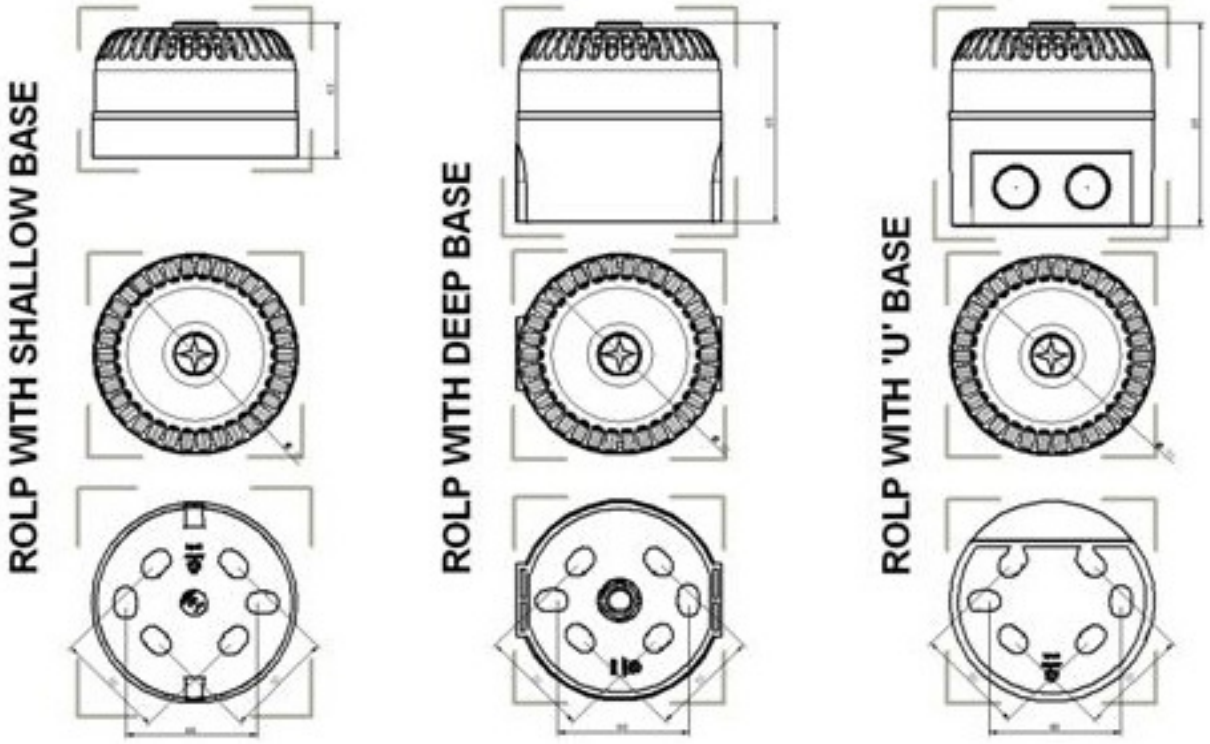
Maintenance Advice

- ***The product is of a low maintenance design. However, systems should be tested on a regular basis after installation. This is vital where products are used in life safety systems. Please refer to current & relevant maintenance practices.***

- ***If the product is installed in a harsh environment, check seals and housing condition for any obvious signs of ware and tear or damage on a periodic basis.***

- ***Cleaning of the product housing should be carried out using non-abrasive and non-corrosive substances. A lightly moistened soft cloth is usually sufficient.***

Product Dimensions



Annex A: Document Change Summary

Issue	Description Of Change	By whom	Date
A	Original Document	Not known	Date unknown
2	Added ROLP to new format	SM	27/11/08
3	Added temporary 'Requires Update' comments in who document & 'By whom' column on Document change Summary	SM	03/12/08
4	Updated document to standard format.	PW	05/05/09