SPA WIRELESS SWITCHES
AND RECEIVERS MANUAL

Drawing Nos 9791 Rev 0 22-05-01

Topline Electronics Ltd Introduction

Topline were established in 1986 to provide high quality equipment. Topline now provide integrated dosing equipment packages with a comprehensive service backup. We believe that our after sales service is an integral part of the company's success, and wish to assure existing and new customers that we will continually review product and service performance with the aim of improving both.

If you are experiencing any problems with your control system or general water quality, please do not hesitate to contact a Topline engineer on 01323-440760.

Topline are always willing to develop new products and services with clients, so if you have an idea on how to improve any of Topline's products or wish to develop a product for your own use, please contact Andrew Hunt on 01323 440760.

Technical Information Radio Switch Transmitter and Receiver

Technical Information.

Transmitter.	Single channel rechargeable battery powered transmitter. Transmit frequency of 433.92MHz. EMC compliant to ETS 300-339 and Type Approved to ETS 300-220.
Receiver.	220 - 240v AC input. Receive frequency of 433.92MHz. EMC compliant to ETS 300-339 and Type Approved to ETS 300-220.
Inductive	Four volts free single pole make outputs suitable for operating resistive or AC/DC loads between 5v and 250v at up to 0.5A. Each output can be programmed on site to either toggle or momentarily make.
Features	Up to four receivers may be used per site giving a total of sixteen switched
Charger.	220 - 240v AC input. 13A plug top construction. 28v DC, 60mA constant current output. Can charge one or two transmitters at the same time.

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CE Certificate Declaration of conformance

Manufacturer's Name	Topline Electronics Ltd
Manufacturer's Address	A8 Ropemaker Park Hailsham, E.Sussex England, BN27 3GU

Declares that the above product conforms to the following product specifications:

Low Voltage Directive 72/73 EEC

Electromagnetic Compatibility Directive 2004/108/EC

Restriction of Hazardous Substances (RoSH)
Directive 2002/96/EC

Waste Electrical and Electronic Equipment (WEEE)
Directive 2002/95/EC

CE marking.
I the undersigned, declare that the equipment above conforms to the above directives and carries the CE marking.

Manufacturer Topline Electronics Ltd

Signature on behalf of Topline Electronics Ltd A. Hunt

Date Feb.10th 2007

Health and Safety Warning

This equipment controls the operation of the feature pumps it does not control the on period of these features. If the incorrect on period is set then chemical control of the water can be difficult.

Remember, if something is wrong with any of the swimming pool systems,
TAKE THE APPROPRIATE ACTION!

Even if this is only to alert your manager. Do not just record a fault and walk away - bad pool management can affect bathers' health.

Risk Assessment

If the equipment is not operated by persons who are not proficient in the operation of swimming pool plant, then there is a risk of:

1. Operation of the receiver with covers removed may result in electrocution.

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Radio Switch Transmitter and Receiver Overview.

The receiver is designed to be used with the matching 2016 transmitters to replace the traditional air operated puffer feature switches. The 2016 receivers will not operate with the old style transmitters. Transmitters without the suffix "N" will not work with a 2016 receiver. New 2016 transmitters will function with old receiver units.

The product comprises of three separate units. A 4 channel mains powered (220 - 240v AC) RF receiver. A single channel rechargeable battery powered transmitter and a mains powered (220 - 240v AC) charger. The receiver provides four volts free single pole make outputs that are suitable for operating resistive or inductive AC/DC loads between 5v and 250v at up to 0.5A.

Up to four receivers may be used per site giving a total of sixteen switched feature outputs.

These two RF products working at 433.92MHz are EMC compliant to ETS 300-339 and are Type Approved to ETS 300-220.

Spa Switch Transmitter and Receiver Installation Overview.

The transmitters need only be mounted into their deck level boxes at the required positions around the pool side. The electronics are totally encapsulated and can withstand immersion in water for very long periods.

Receiver Position:

1) The receiver must be mounted close to the transmitters and in any case must not be greater than 25 meters away.
2) No more than one wall (NOT re-enforced concrete) must separate the transmitters and receiver.
3) There must not be any metal partition sheeting in between the transmitters and receiver.
4) The receiver must not be installed below the level of the transmitters. (Not in underground plant rooms).
5) The receiver aerial must not be closer than 8cm to any metal items.

The receiver has four mounting holes that may be revealed by removing the lid.

Cable entry is via two 20mm holes of which one is blanked off with a rubber stopper.

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Spa Switch Transmitter and Receiver Installation Overview (cont).

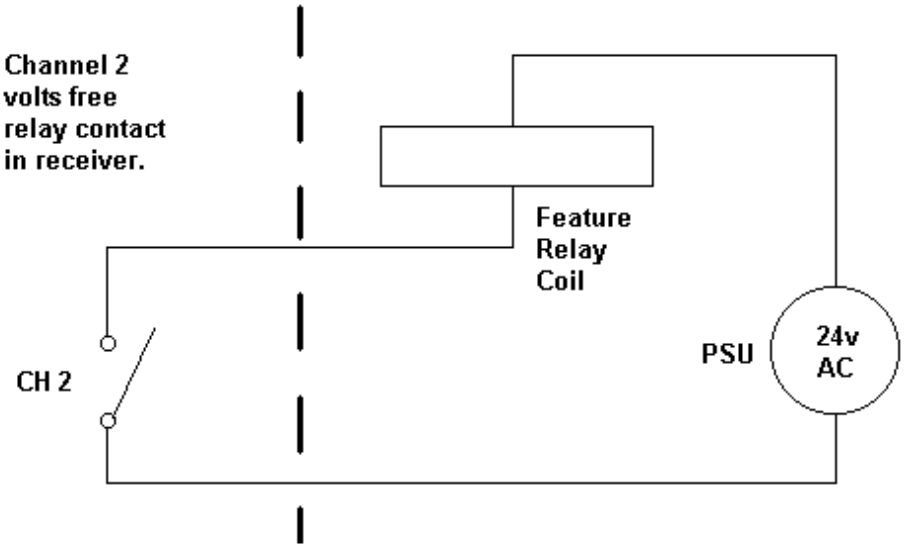
The receiver requires 240v AC mains fed from a 3 Amp MCB. Current consumption is only 0.021 Amps. Connect the mains to the terminal block TB1 marked L, N. No earth wire is needed.

The receiver provides four volts free single pole make outputs that are suitable for operating resistive or inductive AC/DC loads between 5v and 250v at up to 1A. Each output uses 2 screw terminals. Use 1mm multi-core cable rated for the voltage in use. Connect each feature being operated to the appropriate channel output on TB2 as follows:

Transmitter	Receiver SW1	Receiver relay
Transmitter channels 1 to 4	--> SW1 G0 off G1 off.	Channel 1 operates CH 1 on the receiver. Channel 4 operates CH 4 on the receiver.
Transmitter channels 5 to 8	--> SW1 G0 on G1 off.	Channel 5 operates CH 1 on the receiver. Channel 8 operates CH 4 on the receiver.
Transmitter channels 9 to 12	--> SW1 G0 off G1 on.	Channel 9 operates CH 1 on the receiver. Channel 12 operates CH 4 on the receiver.
Transmitter channels 13 to 16	--> SW1 G0 on G1 on.	Channel 13 operates CH 1 on the receiver. Channel 16 operates CH 4 on the receiver.

Note that SW1 G0 and G1 are in the off position when closest to the relays.

Typical connections for one feature.



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Spa Switch Receiver Channel Configuration.

The receiver operates on channels 1 to 4 by default. Other channel groups are programmed by setting 2 DIL switches inside the receiver as follows:

Transmitter channel		Receiver SW1	Receiver relay
Channels 1 to 4	-->	SW1 G0 off G1 off.	Channel 1 operates CH 1 on the receiver. Channel 4 operates CH 4 on the receiver.
Channels 5 to 8	-->	SW1 G0 on G1 off.	Channel 5 operates CH 1 on the receiver. Channel 8 operates CH 4 on the receiver.
Channels 9 to 12	-->	SW1 G0 off G1 on.	Channel 9 operates CH 1 on the receiver. Channel 12 operates CH 4 on the receiver.
Channels 13 to 16	-->	SW1 G0 on G1 on.	Channel 13 operates CH 1 on the receiver. Channel 16 operates CH 4 on the receiver.

Note that SW1 G0 and G1 are in the off position when closest to the relays.

Each channel output can be set to toggle its output when the correct code is received or operate for 2 seconds when a correct code is received from the transmitter.

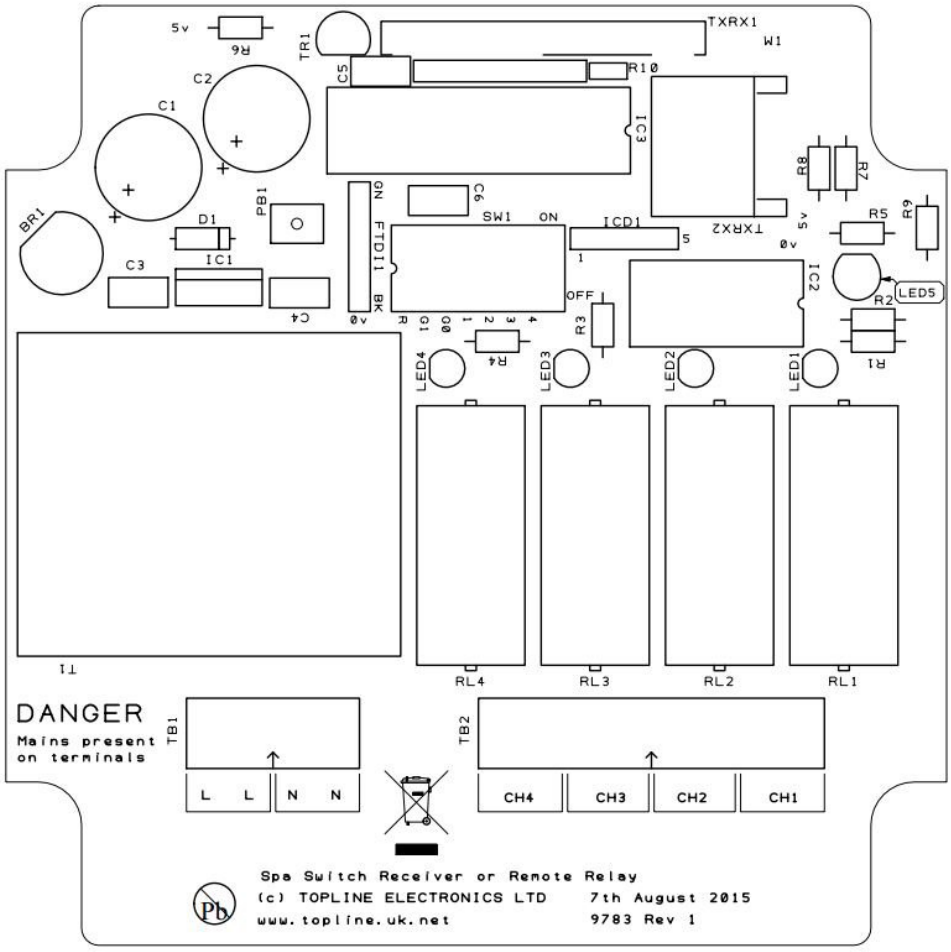
SW1 1 off.	Operate CH1 output for 2 seconds.
SW1 2 off.	Operate CH2 output for 2 seconds.
SW1 3 off.	Operate CH3 output for 2 seconds.
SW1 4 off.	Operate CH4 output for 2 seconds.

SW1 1 on.	Toggle CH1 output.
SW1 2 on.	Toggle CH2 output.
SW1 3 on.	Toggle CH3 output.
SW1 4 on.	Toggle CH4 output.

Spa Switch Transmitter Channel Configuration.

The transmitter is configured at the factory to operate on one of 16 different channels. This cannot be altered once configured.

Spa Switch Receiver Internal View.



Connections.

The terminals on TB1 are numbered 1 to 12 from left to right.

1 --> Live Terminals 1 and 2 are commoned together on the pcb.
2 --> Live
3 --> Neutral Terminals 3 and 4 are commoned together on the pcb.
4 --> Neutral
5 --> Channel 4 volts free relay contact. (Or channel 8, 12 or 16).
6 --> Channel 4 volts free relay contact. (Or channel 8, 12 or 16).
7 --> Channel 3 volts free relay contact. (Or channel 7, 11 or 15).
8 --> Channel 3 volts free relay contact. (Or channel 7, 11 or 15).
9 --> Channel 2 volts free relay contact. (Or channel 6, 10 or 14).
10 --> Channel 2 volts free relay contact. (Or channel 6, 10 or 14).
11 --> Channel 1 volts free relay contact. (Or channel 5, 9 or 13).
12 --> Channel 1 volts free relay contact. (Or channel 5, 9 or 13).

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Spa Switch Receiver Description.

The receiver unit has four independent channels that is configured internally at the factory to operate in one of four different channel groups allowing a total of sixteen features to be switched using four receiver units.

Each receiver channel can have any number of transmitters. e.g. Three transmitters on channel 1, One transmitter on channel 2, Seven transmitters on channel 3 and no transmitters on channel 4 etc, but only twelve transmitter battery low indications will be recognised by each receiver at any one time.

Spa Switch Receiver Operation.

On power up the receiver front panel LED will illuminate for four seconds and then extinguish. From hence forth it will flash every ten seconds. A repetitive flashing signifies that a transmitter rechargeable battery is low and that the battery must be charged up. See the section entitled 'Spa Switch Charging Transformer Operation'.

Each channel output can be set to toggle its output when the correct code is received or operate for 2 seconds when a correct code is received from the transmitter. The channel receiver is then disabled for 6 seconds.

Spa Switch Transmitter Description.

The Spa switch transmitter is a single channel rechargeable battery powered RF transmitter.

Spa Switch Transmitter Operation.

The top of the transmitter has an LED and a piezo switch. The piezo switch must be pushed hard or better still, tapped with a finger for the transmitter to operate. In normal operation the LED will flash twice indicating that a transmission is in progress and that the internal battery is OK. If the LED flashes more than twice this indicates that the battery must be recharged using the supplied charging unit. If the LED does not flash then either the switch has not been pressed hard enough or the battery is completely discharged.

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Spa Switch Charging Transformer Description.

The charging transformer is a mains to low voltage DC constant current converter with a maximum output voltage and current of 28v and 60mA. This will allow up to two transmitters to be recharged at the same time using the supplied connecting leads.

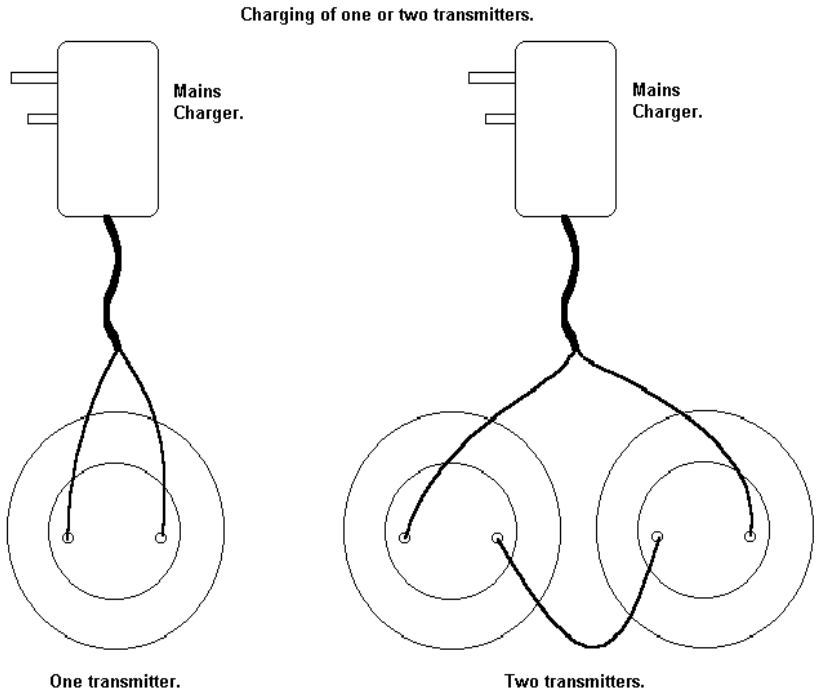
Spa Switch Charging Transformer Operation.

Warning: Under NO account must the charging transformer be operated near water and do NOT use any other type of charger.

Remove the transmitter from its location and replace with a spare transmitter of the same channel number. These are engraved at the back of the transmitter as a series of numbers. eg. 1234/5 denotes channel 5 while 5432/1 denotes channel 1.

If there is no spare transmitter then it is permissible to charge the transmitters overnight and disconnect the charger on the following morning.

Connect the charger as shown in the following diagram. The polarity is not important. The LED will flash every four seconds. It takes 2 hours to fully charge a transmitter after which the LED flashes continuously until the charger is disconnected. At this point the transmitter will cancel the flashing LED on the receiver if it is within 25 meters.



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TWELVE MONTH GUARANTEE

Product **Valid from**

Purchased From

Installed by-: **Commissioned by-:**

Your new Topline Product carries a full 12 month guarantee against faulty materials and workmanship. In the unlikely event that you have cause to complain during this period you should contact Topline Electronics Ltd. Unit 7, Crown Close, Hailsham, East Sussex. BN7 3JF. Phone 01323 440760. We will replace components or the equipment, without charge. Provided that:-

- The Operating Instructions (provided with Equipment) have been followed.
- All routine maintenance as been carried out.
- Service Components installed are approved by Topline Electronics Ltd.
- The Product has not had a repair attempted by others.
- The Product has not been damaged, abused or altered,
- The Product is being used for the purpose it was intended for.

We reserve the right to use substitute Components of similar or higher quality.

This Guarantee does not affect your statutory rights.

PRODUCT SUPPORT.
All of our products can be supported by an Extended Warranty, Service Agreements and System Training.

Our Technical Helpline 01323 440760 can provide assistance during office hours.

Extended warranty
Topline Electronics Ltd offer an extended warranty on new equipment. The extended warranty includes one service and all parts used on that service. The extension periods are 1 year, 2 years and 3 years. Terms are per 12 month guarantee. The offer of an extended warranty is only available within 4 months of the commissioning date. The costs are detailed in the Topline Electronics Ltd price list. Extended warranty must be paid for in advance