



Operating Manual

Noise Activated Warning Sign

GA902

www.castlegroup.co.uk

Thank you for buying a Castle product, I am sure you will find both the goods and the service to be of the highest quality but if not, then please feel free to write to me personally and I will ensure that your needs are dealt with immediately.

This manual is designed to show you the operation of the goods you have purchased and a very brief insight into acoustics itself. If you would like to become a competent person in the eyes of the law, then you may like to know more about our Competent Persons training course for Noise at Work Regulations. You can visit www.castle-training.com to find out more.

It is my intention for Castle Group Ltd to provide a wide range of technical health and safety products and Services of the highest standard. If you would like to know more about any of our other products and services then please telephone on +44(0)1723 584250 or visit www.castlegroup.co.uk

A handwritten signature in black ink, appearing to read 'S Bull', with a stylized flourish at the end.

Simon Bull
Managing Director

Copyright

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Precautions

- Only operate the instrument as described in this manual.
- These are precision instruments, protect from shocks and vibrations.
- Ambient conditions for the operation of the unit are as follows:-
 - Temperature: -10°C to +50°C
 - Relative Humidity: 30 to 90%
- Protect the unit from extremes of temperature and humidity, direct sunlight and air with a high salt or sulphur content.
- Do not use any solvents or cleaning agents on the instrument. Use only a soft dry cloth or a soft cloth lightly moistened with water when necessary.
- Do not allow any conductive objects, such as wire or metal particles to enter the unit.
- Do not try to disassemble the instrument or attempt any repairs as this will invalidate your warranty. Take a note of the condition of the instrument and contact your authorised Castle service station.
- To ensure continued precision performance of your instrument have it checked and serviced at regular intervals.

Contacting Castle Group

This manual contains complete operating instructions for the Noise Activated Warning Sign, read it carefully and you will quickly become familiar with your instrument and its operation.

If you do encounter problems with the operation of your instrument please feel free to contact customer support with your enquiry on: -

Telephone:	+44 (0)1723 584250
Fax:	+44 (0)1723 583728
Website:	www.castlegroup.co.uk
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Contents

Introduction	1
Instrument Description	1
Installation	2
Remote Microphone Option	2
Controls	3
PCB Identification	4
Calibration (RV1).....	4
Trip Time (RV2)	4
Trip Level (SW1)	4
Master Slave Wiring	6
Master Driving Slave(s)	6
Master Driving Master	7
Master Driving Dumb Masters	8
Typical Complex System	9
Wiring	9
Accessories	10
Master/Slave Driving a Mini Beacon	10
Master Driving a Remote Beacon.....	11
Combinations.....	12
Stainless Steel Model GA902 SS	12
Technical Specifications	13
Warranty and After Sales Service	14
Instrument Details	14
Instrument Disposal	15
Disclaimer	15

Introduction

The Castle GA902 instrument is designed to provide a visual warning of high noise levels requiring some form of action.

In its standard form the sign is blank when OFF and clearly visible as an illuminated message when ON.

Normally when illuminated the sign informs the viewer 'Approved Hearing Protection Must Be Worn'. Other message may be supplied to special order.

It is a design feature of the GA902 that the message can only be read when the high noise level activates the device, reinforcing the message sign.

The GA902 which is readable in all conditions is available in four versions: -

GA902	Master 240V/110V
GA902A	Slave 240V/110V
GA902SS	Stainless steel 240V/110V
GA902SSA	Stainless steel slave 240V/110V

All units are sold as 240V or 110V which must be specified at the time of ordering.

The Slave units are lamp assemblies which are driven from the master unit(s).

Instrument Description

The instrument is essentially a standard sound level meter which drives a trip circuit to provide a switch function at a chosen level.

The switch activates the fluorescent light so illuminating the warning message.

After the noise level falls below the chosen trip level the light is extinguished after the preset delay time.

Power is provided by the normal mains source and is housed in a tough metal case similar to the normal EXIT type sign. It is simply either screwed to the location point or may be hung using the hooks provided on the top of the unit.

The microphone is fitted within the unit.

Installation

Choose a suitable location for the GA902 ideally mounted close to the main noise source on the wall, in a position where operators can easily see the display.

The white box can be mounted at any convenient point using screws in the holes provided or alternatively may be hung on chains using the hooks provided.

Power must be provided from a 3A fused mains supply and the following connections must be made: -

Live (240V, 110V)	J6/1
Neutral	J6/2
Earth	J6/3

The unit has a variable overall trip level from 75dB(A) to 112.5dB(A) in 2.5dB steps. The unit is factory preset at 80dB(A).

Remote Microphone Option

The GA902 can be supplied with a remote microphone [ZL1011-10].

If this option is required the built in microphone must be disconnected by unscrewing the three PCB terminals (J1/1,2,3) and pulling the microphone wires out of the terminal block.

These wires should be taped to the inside of the metalwork or alternately cut out and remove completely.

Note that mains power is in this area and the wires cannot be allowed to touch any part of the PCB.

Connect the remote microphone by bringing the cable into the box bottom via one of the cable glands and connecting the wire to the PCB as follows: -

J1/1	power (red or brown)
J1/2	signal (blue or white)
J1/3	screen

Controls

The GA902 is fitted with a TEST pushbutton which when pressed tests the PCB relay and the illumination of the lamps.

Trip Setting

The GA902 is set to trip at 80dB(A) which is the required sound pressure level at the microphone to trip the unit.

This level can easily be adjusted from 75dB(A) to 112dB(A) by the user.

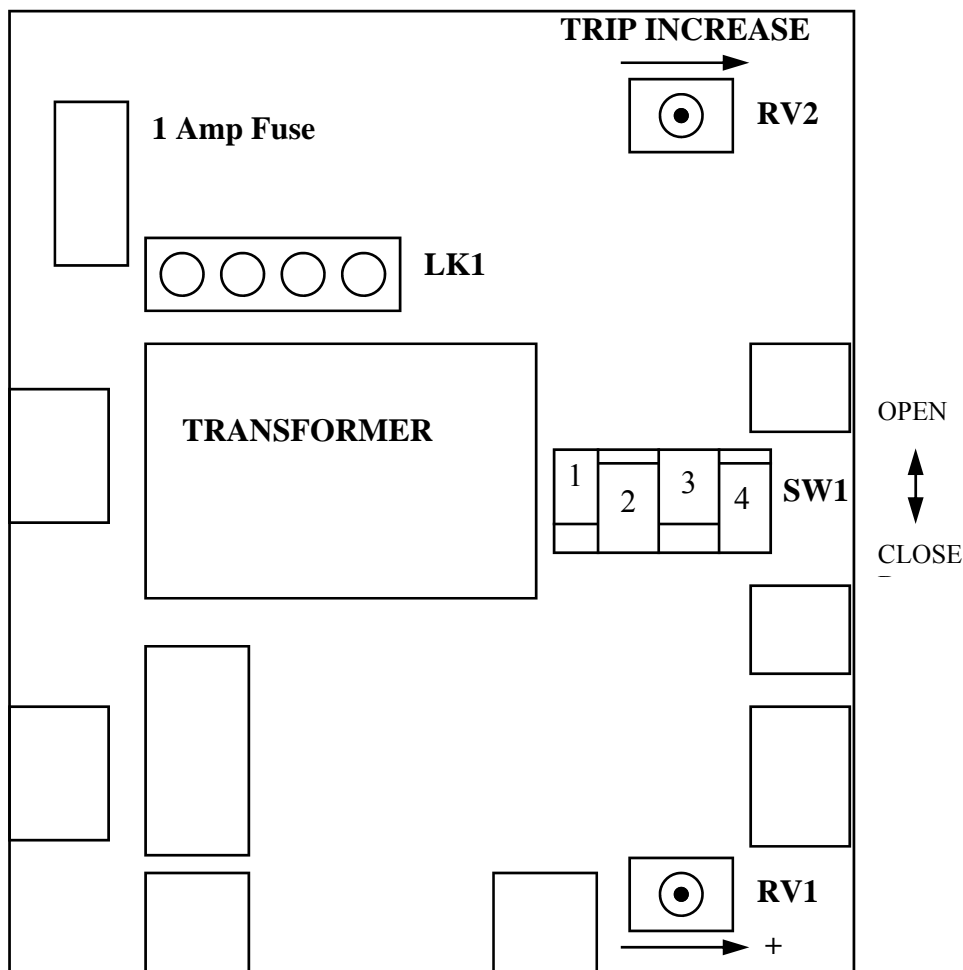
It must be noted that to achieve a warning switch on level of say 80dB(A) at an operators ear position may mean setting the GA902 to work at a lower level (or sometimes higher) to compensate for the distance effects.

From this it can be seen that the levels need to be measured both at the operators position and at the location site for the GA902.

If a sound level meter is not available one may be purchased or hired from Castle Group Limited.

PCB Identification

The diagram below shows the position of the following components on the PCB.



Calibration (RV1)

This potentiometer gives +5dB adjustment to the calibration level and is factory set to match the microphone supplied. This control should not require any further adjustment.

Trip Time (RV2)

This potentiometer may be adjusted to control the tripped period (lamp on period) from 5 seconds to 30 seconds.

Trip Level (SW1)

This switch is used to set the trip level from 75dB(A) to 112.5dB(A) in 2.5dB increments. The table on the following page shows the switch position against trip level.

Access to the control board is gained by removing the right hand side end panel. All adjustments should be done with the power disconnected.

Reconnect the power to test the unit.

WARNING: THERE ARE MAINS VOLTAGES PRESENT INSIDE THE UNIT WHEN SWITCHED ON

Trip Level	Switch SW1			
	1 20dB	2 10dB	3 5dB	4 2.5dB
dB				
75	X	X	O	O
77.5	X	X	O	X
80	X	X	X	O
82.5	X	X	X	X
85	X	O	O	O
87.5	X	O	O	X
90	X	O	X	O
92.5	X	O	X	X
95	O	X	O	O
97.5	O	X	O	X
100	O	X	X	O
102.5	O	X	X	X
105	O	O	O	O
107.5	O	O	O	X
110	O	O	X	O
112.5	O	O	X	X

O - OPEN
X - CLOSED

Master Slave Wiring

There are several different types of warning systems that may be put together using the GA902 meter and the GA902A slave units as shown below.

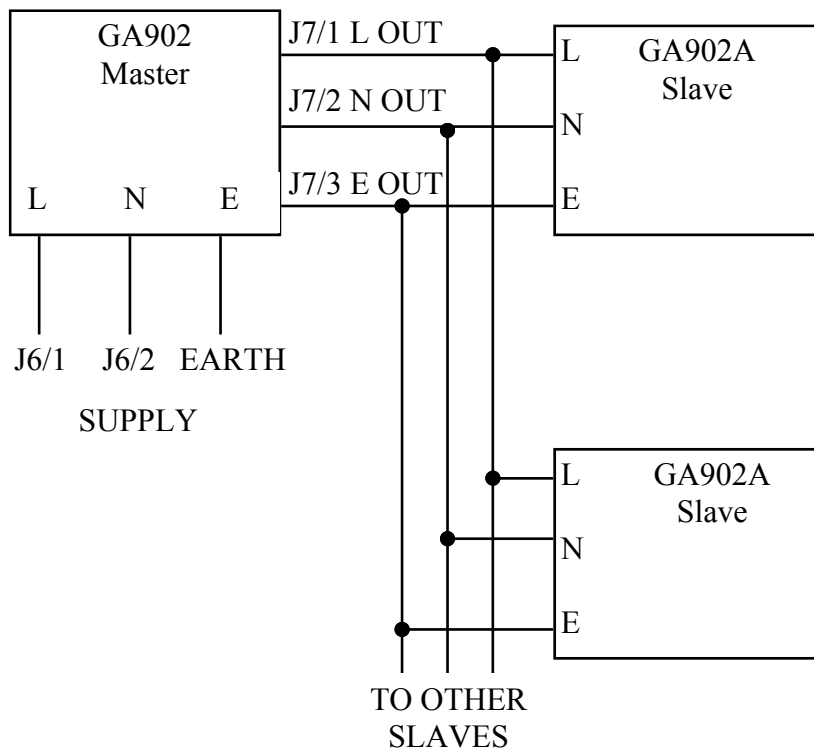
Master Driving Slave(s)

A GA902 (master) may drive up to 4 GA902A(s) (slaves) such that if the master unit switches on then the slave unit(s) will also switch on.

This is particularly useful for situations where the slave unit is placed above a doorway leading to the noisy environment to give advanced warning that hearing protection must be worn.

A GA902 Master unit will drive a maximum of 4 GA902A Slave units.

The wiring is shown below: -

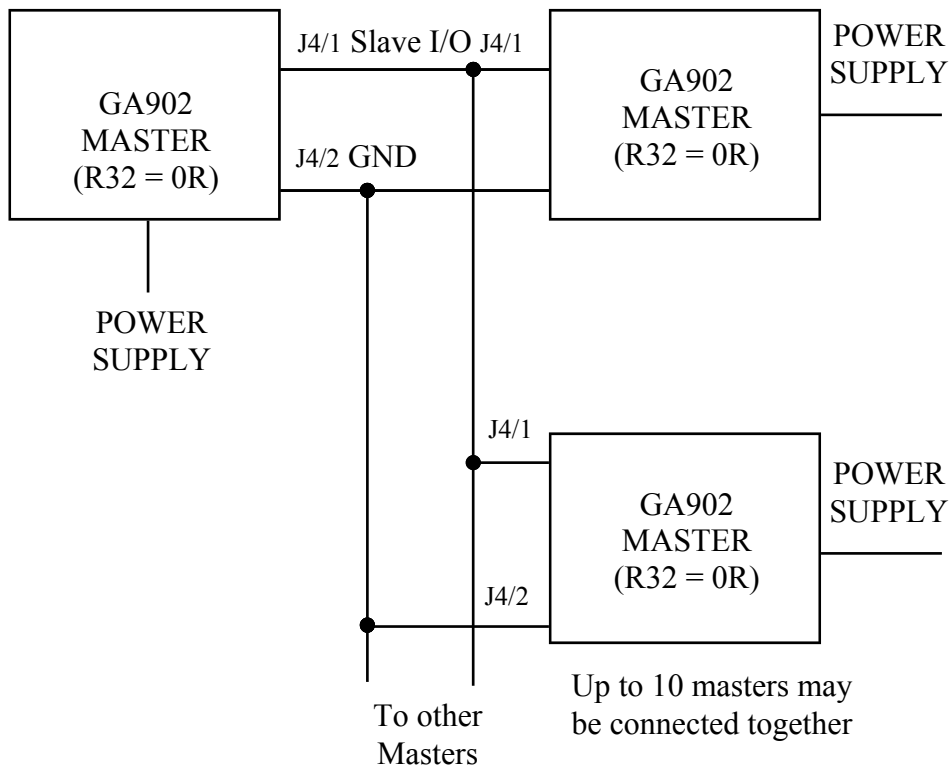


Master Driving Master

A GA902 (master) may drive up to 10 GA902 master units such that if any master unit is on then all the masters will also switch on.

This is useful where several units are located around a large factory where ear protection must be worn if any master unit switches on.

The wiring is shown below: -

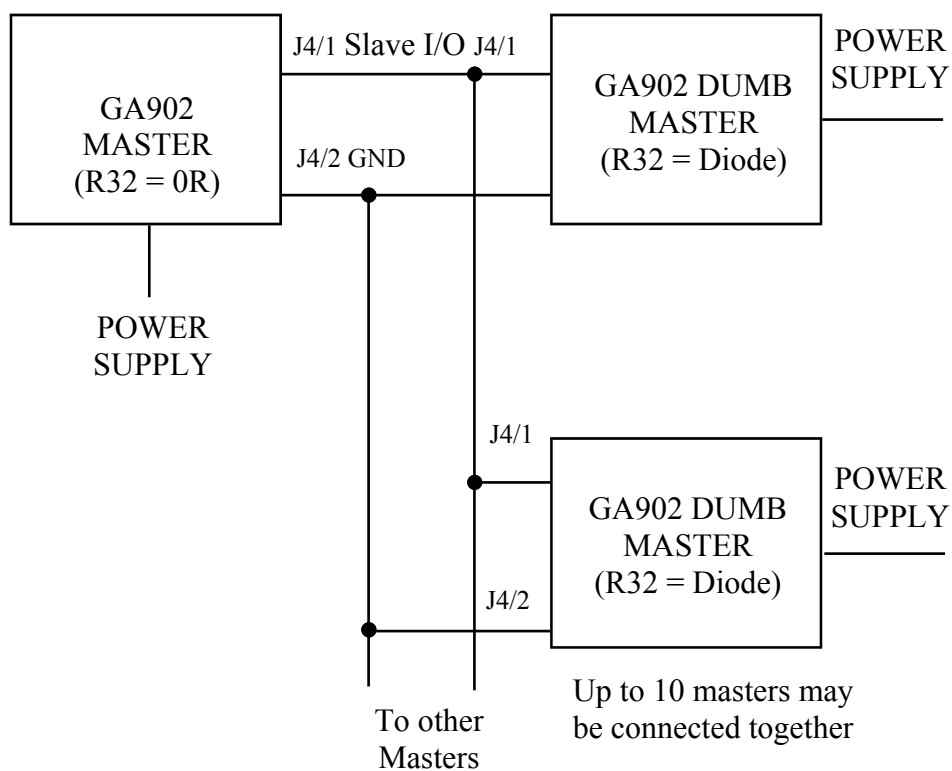


Master Driving Dumb Masters

A GA902 master may be converted to a dumb master by removing the OR wire link from position R32 and replacing it with a diode such as a IN4148 or IN4001 etc.

In this mode the dumb master will only switch on from a local noise (self trip) but the master will switch on if either unit is switched on.

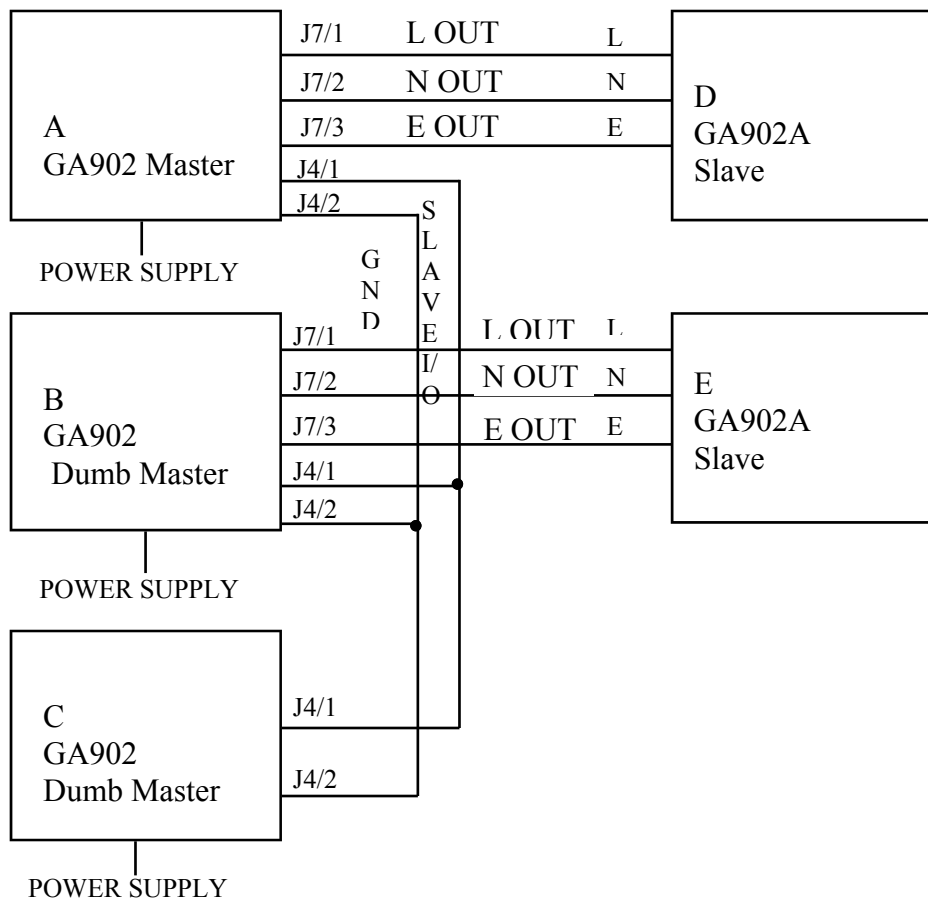
The wiring is shown below: -



Typical Complex System

An example is shown below where there is a mixture of masters, dumb masters and slaves all connected together to form a warning system: -

- A on when self tripped or B or C on
- B on when self tripped only
- C on when self tripped only
- D on when A, B, or C on
- E on when B is on only



Wiring

All cables must enter or leave the units via the two cable entry glands at the bottom right hand side of the unit.

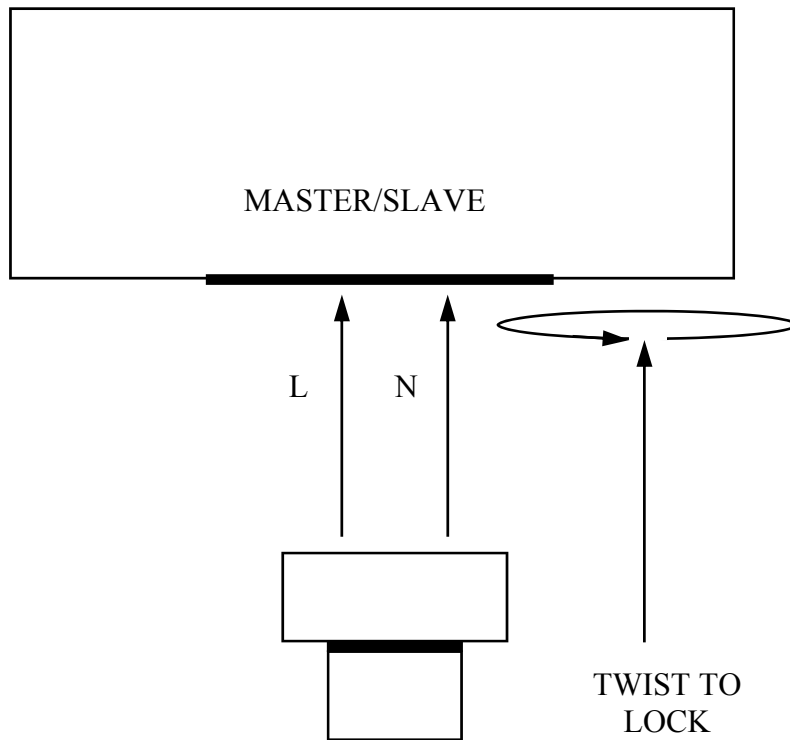
Accessories

Master/Slave Driving a Mini Beacon

Both the GA902 and the GA902A are capable of driving a small amber beacon which attaches to the under-side of the warning sign. The beacon emits a high intensity pulse of light at a nominal flash rate of approximately 1 per second.

Normally, the warning sign will be supplied with a mounting plate secured to its under-side. To install the beacon, pass the attached cable through the centre of the mounting plate and terminate at the lamp tray connector block.

The wiring is shown below. Once the wiring is complete the beacon can be attached to its mounting plate by locating and twisting to lock.



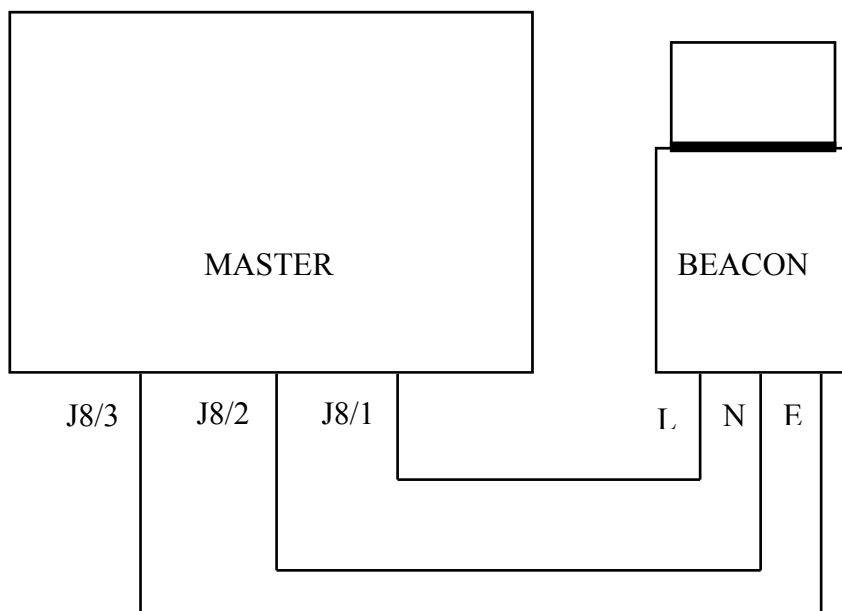
Master Driving a Remote Beacon

The GA902 is also capable of driving a single free-standing remote beacon.

This could be particularly useful for situations in which a weatherproof visible sign is required indicating that hearing protection must be worn before entering a noisy environment.

The remote beacon is of the rotating mirror type and emits a bright sweeping light.

A bracket is provided in order to ensure correct vertical mounting. The wiring is shown below: -



Combinations

A single GA902 Master is obviously limited by the amount of current it can supply to slaves and beacons.

The table below outlines all of the current ratings for the various GA902 accessories.

The total current drawn by the GA902, slaves and beacons must not exceed 1 Amp.

GA902 Accessory selection guide		
	Current (mA)	Current (mA)
UNIT VOLTAGE	110v	240v
MASTER	172	79.5
SLAVE	145	67
MINI BEACON	24	15
REMOTE BEACON	590	280
MAX CURRENT	1000	1000

Stainless Steel Model GA902 SS

The GA902 Stainless Steel is a special product for the food industry which is substantially splash proof but not totally waterproof to submersion in liquid. The unit may be wiped clean but care must be taken to avoid damage to the microphone membrane.

Access to the unit is gained by removing the eight screws holding the front screen and carefully removing the retainer and screen. Functionality of the unit is similar to the standard GA902. We recommend greasing the screws before final assembly.

The GA902SS is fitted with a TEST facility to check that the PCB relay and lamps are working. To activate this, hold the Test Magnet (supplied) against the TEST area on the front screen (the area inside the red-bordered rectangle).

Technical Specification

Trip Range:

75dB to 112.5dB in 2.5dB steps switch selectable
+5dB calibration control (factory set)

Trip Time:

5 seconds to 30 seconds user adjustable (potentiometer)
When tripped unit automatically resets after trip time

Frequency Weighting:

A weighted in accordance with BS EN 60651 Type 2

Time Weighting:

Slow 1000ms in accordance with BS EN 60651 Type 2

Microphone:

Type: Electric Condenser
Sensitivity: -65dB (0dB = 1V/ μ Bar 1000Hz)
S/N ratio: 40dB

Calibration:

Factory Calibrated

Illumination:

Two 8W fluorescent tubes

Temperature:

Operating range: -10 to 50C
Effect of temperature: <0.5dB from -10 to 50C

Humidity:

Effect of Humidity: <0.5dB from 30% RH to 90% RH

Overall Dimensions and Weight:

520W x 200H x 120D mm
4.2Kg

In the interest of continued development, Castle Group Ltd reserve the right to change any specification without due notice.

Warranty and After Sales Service

Castle Group Ltd design and manufacture precision instruments, which if treated with reasonable care and attention should provide many years of trouble free service. In the event of a fault occurring, during the warranty period, the instrument should be returned to Castle Group Ltd, in its original packaging, or to an authorised agent. Please enclose a clear description of the fault or symptom.

Details of the warranty cover are available from Castle Group Ltd or an authorised agent.

All instruments are designed to meet rigid British and International Standards. An annual calibration is recommended to ensure that these high standards are maintained. This is particularly important for cases in which instrument readings are to be used in litigation or compliance work.

For warranty and service return to: -

The Service Department
Castle Group Ltd
Salter Road
Cayton Low Road Industrial Estate
Scarborough
North Yorkshire
YO11 3UZ

Telephone: +44 (0)1723 584250
Fax: +44 (0)1723 583728
Email: techsupport@castlegroup.co.uk
Web: www.castlegroup.co.uk

Any misuse or unauthorised repairs will invalidate the warranty.

Instrument Details

For your records and for future correspondance with Castle Group Ltd regarding your instrument, please complete the following details: -

Instrument Model

Instrument Serial Number

Purchase Date

Instrument Disposal



The symbol shown here can be found on your instrument and means that the product is classed as electrical or electronic equipment and should be disposed of at the end of its life separately to your commercial or household waste.

The Waste of Electrical and Electronic Equipment Directive (2002/96/EC) has been established to help reduce the influx on landfill sites and effectively treat hazardous substances by using best practices for the recovery and recycling of products.

There are various collection systems in place within the EU for the disposal of your product. To find the nearest UK waste recycling point in your area, enter your postcode in the website www.recycle-more.co.uk

For more information please contact your local authority, the dealer where you purchased your product or Castle Group Ltd.

Disclaimer

Whilst every effort is made to ensure the accuracy and reliability of both the instrument described and the associated documentation, Castle Group Ltd makes no representation or warranties as to the completeness or accuracy of this information.

Castle Group Ltd assumes no responsibility or liability for any injury, loss or damage incurred as a result of misinterpreted or inaccurate information.

Any documentation supplied with your product is subject to change without notice.