



Fig 1

Operation Guide & Recommended Fitting Instructions.

SP904/3/4/5/7/8/10/11/13 Integrated Wireless Side Warning System

The SP904 integrated is a fully flexible, easily expandable vehicle blind spot warning system with a 3 year comprehensive warranty.

Allowing for sensors to be installed to the cab area, nearside, offside of the body and or rear of a vehicle for reversing purposes, providing surround warning if required.

It is suitable for rigid and tractor trailer vehicles with a coded wireless signal between trailer & tractor, whilst also allowing sensors fitted to the tractor to work independently when no trailer is present.

OPERATION

- Front & sides warning on ignition
- Rear warnings on selecting reverse gear
- System shut down linked to speed usually above 12.5mph
- Traffic light visual warning from 1.5m for front/ side warnings (**GREEN 1.5m, AMBER 1.0m, RED 0.6m**) with **AMBER** directional LED which also flashes when obstruction within 0.6m via in cab display (CDU)
- Audible warning (3 loud Bleeps 0.6m) when obstruction in close proximity (side warning)
- Traffic light visual warning from 2.6m for rear with progressive audible beeping (reverse gear only)
- Self test, self diagnosis function (see later) to ensure safe operation

SPECIFICATION

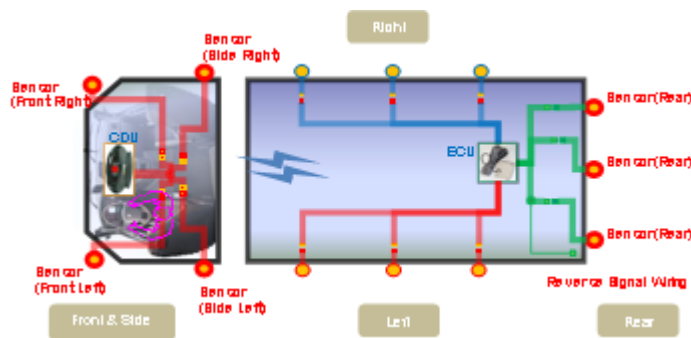


Fig 2

- | | |
|-------------------------|---------------|
| • Rated Voltage | 12 – 24v DC |
| • Operating Voltage | 10v – 32v |
| • Operating Temperature | -20°C to 70°C |
| • Current Consumption | Max 0.5A |
| • Communication Freq | 433.92MHz |
| • Ultra Sonic Freq | 40KHz |
| • Sensing angle | 90° |
| • Speaker decibel | 70dB |

INSTALLATION

- **Selecting the sensor hole positions is vital. Before commencing installation it is important to manually position the sensors on the vehicle to ensure correct sensing area.**

IF IN DOUBT TEL 01656 721 871 FOR TECHNICAL ASSISTANCE



Fig3



Fig 4

- A. The positional of the sensors above the road surface is vital. The optimum height is $70\text{cm} \pm 10$, always be aware before commencing installation the operating parameters of your vehicle and what you are looking to detect with the sonar system.
- B. The sensors should be located no further than 1 meter each apart
- C. See **Fig 1** for **suggested** location of sensors(different vehicles may require a different location). Please note Cross rail and TFL require sensors around front nearside area
- D. Any continuous overhang can cause sonar echoes, which may confuse the processor. Again manually check position before installation commences
- E. It is essential that the sensors are fitted on a vertical surface so they project the ultrasonic beam parallel to the road
- F. Use the masking tape to accurately position the holes prior to drilling
- G. Drill holes diameter 26 mm (you may need to file out slightly) or attach brackets (available in standard or heavier duty)
- H. Insert Sensor Cables
- I. Ensure Arrow marked on the outer flange of the Sensor is pointing upwards in the 12 o'clock position, (**fig 4**)
- J. Press the sensor home into the hole or tubular bracket, it is important that the sensors fit smoothly into the hole, excessive force may cause damage to the sensor therefore affecting the function of the system. ENSURE HOLE IS NOT TOO TIGHT as this can affect function
- K. It is possible you may require the sensor extension cable depending on location of sensors to be able to connect to ECU wire loom

Recommended Fitting Procedure ECU

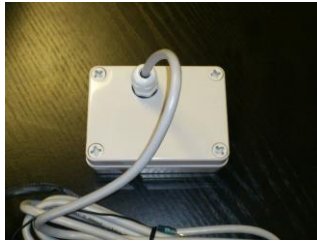


Fig 5

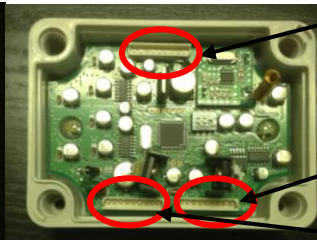


Fig 6

Attach ECU wire loom here
firmly for rear sensors

Attach ECU wire loom here
firmly for right hand side

Attach ECU wire loom here
firmly for left hand side



Fig 7

- A. The ECU(*fig 5*)case is completely water proof and dirt proof
- B. The ECU wire loom (*fig 7*) for left or right side - Red power line should be connected to ignition. Black to negative
- C. The ECU wire loom (*fig 7*) for rear – Red should be connect to reverse light feed, Black to negative
- D. NOTE ECU LOOM HAS CONNECTIONS FOR 3 SENSORS DO NOT PLUG THIS LOOM INTO CDU UNIT OR DAMAGE MAY OCCUR**
- E. Connect each sensor cable to corresponding connection on ECU wire loom
- F. Plug ECU wireloom into ECU firmly at point highlighted (*fig 6*) through aperture/s and secure cable/s with water proof gland/s provided. The Water proof gland **MUST** be tightened with a spanner to ensure water proof seal

Recommended Fitting Procedure CDU



Fig 8



Fig 9



Fig 10

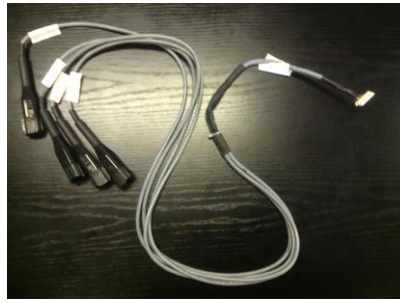


Fig 11

- A. The power cable should be connected to the CDU as highlighted in **Fig 9** and passed through the base of the CDU bracket
- B. Connect the other end of the power cable **Fig 10** to Ignition (Red) live, (black) negative. The speed wire is analogue (white) and should be connected to a suitable speed signal dependant on vehicle (should you decide not to connect this wire, sensors will be on all the time, in which case you must connect this wire to ground or a malfunction may occur), usually but not limited to **B6 or B7 (V imp) at back of tachograph or on older tachograph PIN C3. Many vehicles will have body builder plug for speed signal, but this may need to be turned on by manufacturer/dealer. The speed signal is 5v square pattern**
- C. Connect the CDU sensor wireloom **Fig 11** to CDU as highlighted in **Fig 9**
- D. NOTE CDU WIRE LOOM (fig11) HAS CONNECTIONS FOR 4 SENSORS AND ONLY USED ON SP904/4/5/7/8/10/11/13 IT IS NOT USED ON SP904/3. DO NOT PLUG CDU WIRE LOOM INTO ECU UNIT**
- E. Connect the front sensors to the corresponding connection on the CDU wireloom
- F. For side sensors, please ensure CDU and ECU are on the same ignition feed, not one of Aux and one main power
- G. Attach the CDU bracket to the desired position in the cab, by using the 22mm countersunk screws and adhesive strip provided.
- H. Secure the CDU to the bracket by firmly depressing the units together
- I. Set the speed switch cut off by driving to desired speed and press button **Fig 8** (*this must only be done after ID registration and waiting at least 1 minute*)
- J. Please note that the sensors connected to the CDU will work independently to those connected ECU

ID Registration & Speed:

Each system has an individual code supplied from the ECU and the sensors connected to the ECU will only work when ID registration has been completed.

This system ensures that there will be no interference from other systems which are in close proximity.

The SP904 CDU should have been pre registered with the ECU supplied.

In the event of non function, please press and hold the button on the front of the CDU. You **MUST** do this prior to turning on ignition or for rear sensors engage reverse after pressing the button on the front of the CDU *Fig 8*. The CDU display will start to flash **RED**, release button, if successful, the display will then flash **GREEN**. Turn off the ignition and then turn on ignition and system should function with “do-so-me” tone heard.

For tractor / trailer units you will need to carry out this procedure every time a trailer is changed. NOTE: THE SENSORS ON THE TRACTOR UNIT WILL CONTINUE TO FUNCTION

(This tone is to confirm the CDU & ECU are communicating)

The speed cut out has been set at the factory (provided you have connected the white speed wire) @ 12.5mph

To set the cut out at a different speed, start the engine, wait for do-so-me tone, then wait 1 minute, drive vehicle to desired cut out speed and press button on front of CDU **fig 8**.

WARNING: DO NOT SET THE SPEED CUT OUT WHEN STATIONARY AS THIS MAY CAUSE THE SENSOR SYSTEM TO SHUT DOWN IMMEDIATELY ON START UP

FAULTS

The SP904 integrated has a self test function for faulty sensors, when an amber light will be displayed in the CDU and an indication lamp to identify front, side or rear sensor fault. Faults on sensors connected to ECU will be displayed first.

Example:

Fault on sensor 2 connected to CDU and fault on Sensor C connected to rear ECU loom. CDU will display as **fig 15** bleep 3 times, it will then display as **fig 12** and bleep 2 times. It will follow this procedure a total of 3 times before switching off

Please also see the table below



Fig 12



Fig 13



fig 14



fig 15

FAULT DIAGNOSIS TABLE

Fault	Possible Cause	Solution
On start-up CDU displays as Fig 12 . Single bleep every 3 seconds, 3 times	Sensor on CDU cable 1 is reporting a fault	<ul style="list-style-type: none"> Ensure sensor is correctly connected to cable or replace sensor
On start-up CDU displays as Fig 12 . 2 bleeps every 3 seconds, 3 times	Sensor on CDU cable 2 is reporting a fault	<ul style="list-style-type: none"> Ensure sensor is correctly connected to cable or replace sensor
On start-up CDU displays as Fig 12 . 3 bleeps every 3 seconds, 3 times	Sensor on CDU cable 3 is reporting a fault	<ul style="list-style-type: none"> Ensure sensor is correctly connected or replace sensor
On Start-up CDU displays as Fig 12 . Single bleep followed by multiple bleeps	Multiple sensor fault reported or faulty CDU or faulty CDU wireloom Single bleep cable 1 2 bleeps cable 2 3 bleeps cable 3 4 bleeps cable 4	<ul style="list-style-type: none"> Replace corresponding sensor first, if this does not resolve the issue. CDU should be replaced. Finally replace CDU wireloom
On Start up CDU displays as Fig 13,14 or 15 Single bleep every 3 seconds 3 times	Sensor on ECU cable Left Fig 13 Right Fig 14 Rear Fig 15 Reporting fault on cable A	<ul style="list-style-type: none"> Ensure sensor correctly connected or replace sensor

On Start up CDU displays as Fig 13,14 or 15 2 bleeps every 3 seconds 3 times	Sensor on ECU cable Left Fig 13 Right Fig 14 Rear Fig 15 Reporting fault on cable B	<ul style="list-style-type: none"> • Ensure sensor correctly connected or replace sensor
On Start up CDU displays as Fig 13,14 or 15 3 bleeps every 3 seconds 3 times	Sensor on ECU cable Left Fig 13 Right Fig 14 Rear Fig 15 Reporting fault on cable C	<ul style="list-style-type: none"> • Ensure sensor correctly connected or replace sensor
On Start up CDU displays as Fig 13, 14 or 15 alternatively with single and multiple bleeps each 3 times every 3 seconds	Sensor failure on more than one ECU wire loom, fault ECU or Faulty wireloom 1 bleep Sensor A 2 bleeps Sensor B 3 bleeps Sensor C	<ul style="list-style-type: none"> • Replace corresponding sensor first, if this does not resolve issue then replace ECU, finally replace Loom
System seems to operate very intermittently	Sensor holes may be too tight	<ul style="list-style-type: none"> • Move sensors slightly out of their hole and check system operates. If so slightly enlarge aperture using a file and relocate sensor
No sound or warning light from CDU	No obstruction detected CDU and ECU not communicating Faulty CDU Faulty ECU Speed cut out has been set to 0MPH	<ul style="list-style-type: none"> • When ECU & CDU communication “do-so-me” tone should be heard on start up for vehicles equipped with side sensors. • The “do-so-me” tone will only be heard on engaging reverse on vehicles equipped with rear sensors • Position vehicle within the detection parameters of the sensors • Ensure both CDU wire loom and power are connected • Press button on front of CDU fig 8, if this flashes red, possible failure of ECU • If nothing is displayed in CDU and power connected, replace CDU • Drive vehicle up to cut out speed and press CDU button
Front sensors work, but side/rear sensors do not	No power to ECU or faulty ECU	<ul style="list-style-type: none"> • Rear sensors will only work in reverse. • Turn on ignition, for side sensors and rear sensors follow ID registration procedure as outlined previously. If no “do-so-me” tone check to ensure power is being received to ECU • If power received and system does not function replace ECU
CDU display goes red immediately when turning on ignition, bleeps 3 times and LED continues to flash	Sensor is detecting an obstruction	Ensure that there are no obstructions within the vicinity of the vehicle. There is no “dead zone” on the sensors therefore any overhang e.g. indicator housing will be detected or if sensors are located too close to the ground. Sensors may need to be installed in a different location
CDU continues to give warning at high speed	Speed signal not set or speed wire not connected	Turn on engine and wait for “do-so-me” tone. Wait at least 1 minute. Drive to desired cut off speed e.g.10mph and press registration button fig 8 If this does not work call engineer to install signal

CERTIFICATIONS



THE UNITED KINGDOM VEHICLE APPROVAL AUTHORITY

COMMUNICATION CONCERNING THE APPROVAL GRANTED ~~THE APPROVAL EXTENDED~~
~~APPROVAL REFUSED~~ ~~THE APPROVAL WITHDRAWN~~ ~~THE PRODUCTION DEFINITELY~~
~~DISCONTINUED~~ OF A TYPE OF ELECTRICAL/ELECTRONIC SUB-ASSEMBLY WITH
 REGARD TO REGULATION NO. 10.03



Approval No.: 10R-038200

Extension No: Not applicable

1. Make (trade name of manufacturer): SUNGBO
2. Type and general commercial description(s): SP904 / SP904 (Wireless back sonar)
3. Means of identification of type, if marked on the vehicle/component/separate technical unit^(*): SP904
- 3.1. Location of that marking: On the rear side of product
4. Category of vehicle: Not applicable
5. Name and address of manufacturer: Sung Bo Industries Co., Ltd.
29, 1gongdan-ro 9-gil, Gumi-si, Gyeongsangbuk-do, 730-904, Republic of Korea
6. In the case of components and separate technical units, location and method of affixing of the ECE approval mark: Adhesive label on the rear side of product
7. Address(es) of assembly plant(s): Sung Bo Industries Co., Ltd.
29, 1gongdan-ro 9-gil, Gumi-si, Gyeongsangbuk-do, 730-904, Republic of Korea
8. Additional information (where applicable): See appendix
9. Technical Service responsible for carrying out the tests: Vehicle Certification Agency
KSP284309

An executive agency of the Department for Transport
June 2012 Revision 2



Statement of Opinion

by the Notified Body TÜV Rheinland LGA Products GmbH
 according to the R&TTE Directive 1999/5/EC
 Notified under No. 0197 to the EC Commission

Registration No.: RT 60093157 0001

Report No.: 14035385 001

Holder: Sung Bo Industries Co., Ltd.
235, Gongdan-dong
730-030 Gumi-si, Gyeongsangbuk-do
South Korea

Product: Radio Equipment
(Wireless back Sonar)

Identification: SP904

Essential requirements: Directive 1999/5/EC (R&TTE)
Article 3.1a Electrical Safety
Article 3.1a Health
Article 3.1b EMC
Article 3.2 Radio spectrum

With respect to Article 10 of the Directive 1999/5/EC, based on the technical construction file presented according to Annex IV of the Directive, the Notified Body of TÜV Rheinland LGA Products GmbH confirms, that the listed product complies with the above mentioned essential requirements. Not mentioned essential requirements may be relevant (see Annex I of this certificate), but were not considered by the Notified Body. This certificate consists of this page and Annex I.

Date: 02.04.2014



TÜV Rheinland LGA Products GmbH - Tillystraße 2 - 90431 Nürnberg

CE The CE marking may only be used if all relevant and effective EC Directives are complied with. CE

E Mark



Accredited Testing Laboratory under the terms of ISO/IEC 17025

ENVIRONMENTAL TEST REPORT

for

Product: Ultra Sonic Sensor Module

"Model Name(s): SC-901"

APPLICANT

Sung Bo Industries Co., Ltd.
235, Gongdan-dong, Gumi-si, Gyeongsangbuk-do, Korea

April 01, 2014

Test Result:

"Refer to the test results attached"

1. As a test result of sample which was submitted from the client, this test report does not guarantee the whole product quality.
2. This test report should not be used for public relations, advertisement, conduct propaganda and raised for a suit without a written agreement of testing institute, and should not be used for various purpose beside subscribed use.
3. This test report including test result conducted by using the test method which was suggested from a client.

Gwon Woo Lee / Managing Director

This is only valid in connection with Test Report: K14R-301

It should not be reproduced except in full, without the written approval of ONETECH Corp. File: hlm00101Rev. D
 HEAD OFFICE : 301-14 Daesan-gu, Chosil-eup, Gwangju-si, Gyeonggi-do 464-862 Korea
 (TEL: +82-01-779-8930, FAX: +82-01-779-8938, URL: http://www.onetech.co.kr)

CE Mark

CERTIFICATE
of Conformity



Registration No.: AK 50115592 0001

Report No.: 13601369 002

Holder: Boxco Inc.
Boxco Bldg.,
577-16, Gwagebeop-dong, Sasang-gu,
Busan 617-809
Rep. of Korea

Product: Empty Enclosure
Empty Enclosure

Identification: Type Designation : EC urw-xyz series
(u = A; v = 0; T; w = P, R, S, M;
x = 05-63; y = 06-83; z = 03-26)
Degree of Protection : IP67, IP68
Serial No. : N/A - (prototype)
Remark: Only clause 9.6 and 9.7 have been tested (IP and IK).

Tested acc. to: EN 62209:2003

The certificate of conformity refers to the above mentioned product. This is to certify that the specimen is in conformity with the assessment requirement mentioned above. This certificate does not imply assessment of the production of the product and does not permit the use of a TÜV Rheinland mark of conformity.

Cologne, 27.09.2007



Certification Body

Dipl.-Ing. D. Löffler

TÜV Rheinland Product Safety GmbH - Am Grauen Stein - D-51105 Köln

IP67 Sensor rating

IP67 ECU rating

Warning:

The accurate operation of the system could be adversely affected by any of the following:

- Narrow radius obstacles such as wire, rope & cable.
- Items which absorb ultrasonic waves such as clothing, sponge & snow.
- Irregular reflection of ultrasonic waves on rough surfaces
- Strong electromagnetic waves close to the vehicle.
- Mud, rain & and snow covering the sensor surface.

Remember:

THIS DEVICE IS A DRIVING AID; THE DRIVING PROCESS IS ALWAYS THE DIRECT RESPONSIBILITY OF THE DRIVER.