![Woodway]

INSTALLATION GUIDE

Opti-Din Handset

Disclaimer

This document is intended to be used as a reference guide for the installation and operation of the Opti-Din Control System.

Every effort has been made to ensure the reliability and accuracy of the information contained in this manual at the time of going to press. However, specifications and procedures are subject to change due to our constant endeavours to meet customer requirements, and to maintain a research and development process of continuous improvement for all Woodway products.

Woodway Engineering Ltd reserves the right to make changes in product and documentation specifications and procedures at any time and without notice. The information contained in this manual is believed to be reliable and accurate with regard to the Opti-Din Control System. The company shall not be held liable for improper installation, operation, or maintenance of the system in circumstances where procedures and specifications have not been followed correctly. It is essential therefore, that you follow the specifications, procedures, and recommendations outlined in this manual.

Important Installation and Safety Notes

CAUTION! Modules and connectors are not waterproof. Install modules and cables in a dry location away from excessive heat, humidity and any components likely to damage the system.

It is the installers responsibility to ensure that;
- The method of installation does not damage or interfere with the vehicle equipment and wiring.
- If the vehicle is fitted with airbags, the installation does not interfere with the operation or effectiveness of the airbags, or this will cause the equipment to become a projectile that could cause death or injury.
- All connections to chassis are taken direct to the battery.
- Fuse ratings are changed to suit specific applications.

The proximity of certain radio equipment may interfere with Opti-Din data transmission. To reduce this possibility, Opti-Din and radio equipment wiring should always be kept well apart and should not, under any circumstances, be harnessed or fastened together.

The installers should supply all mounting fixings.

It is the user's responsibility to ensure that;
- The system is used in a safe and responsible manner to ensure the safety of both themselves, their passengers, other road users and pedestrians.
- The system and its installation are properly maintained to ensure its effective operation.

WARNING! Failure to follow these safety precautions and instructions could result in damage to the product or vehicle, and/or serious injury to your passengers.

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The Opti-Din Control System

This switch panel is not recommended for use with any other than specific Woodway Engineering equipment. If the unit is used with any other system the warranty will be void.

The Opti-Din keypad can be used either as a hand held unit or fitted into a standard din style dashboard casing. The Opti-Din Control System provides a flexible and intuitive control interface between the driver and the vehicle's equipment. The complete system typically comprises the Opti-Din Keypad; (hand held unit supplied with a bracket or the din fitted unit) and a data-encoding Output/Receiver Module.

Supply Characteristics

Supply voltage: 12Vdc
Current draw: Maximum (All switches active) 6.8A Minimum (Sleep Mode) 0.01Amps

Approvals

- VCA Approved to 72/245/EEC amendment 95/54/EC
- CE Marked
- PITO AES Specification 5 Issue 10

The Output/Receiver Module

The Keypad connects directly to the Output/Receiver Module (left) via an RJ45 connection (Ethernet style).

The Output /Receiver Module decodes the data and activates the required outputs via a 14-way connector (note that position 14 on this connector is not used). A green 'Data OK' led flashes to indicate that the data link is functioning. The switch outputs from the Output /Receiver Module interface directly with the low current control wiring of Woodway-supplied light bars, sirens, and strobe power supply systems. The outputs may be used to control high current auxiliary equipment via automotive relays. The output circuits incorporate back EMF protection eliminating the need for diodes to be placed across the coils of any relay used.

The output channels of the Output Receiver module are self limiting to prevent damage should the load on any channel exceed approximately 0.5 amps. In order to prevent damage to the electronics within the receiver the overload protection

operates instantaneously when this current is exceeded. Devices that contain capacitors will cause high in rush currents which may cause the unit to self limit. This will be even more evident when the engine is running due to the higher battery voltage.

We strongly recommend that with the exception of low current switching Woodway light bars, all devices to be controlled are connected via relays as shown on page 10 of the installation information.

OUTPUT RECEIVER MODULE

OUTPUT RECEIVER MODULE

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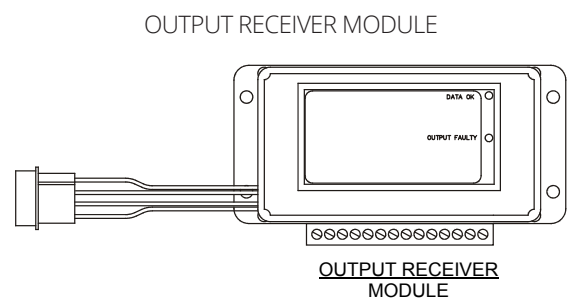
System Operation

Keypad Switches 1-13

The Keypad has 12 standard control switches, 1 siren control switch and a 999/arrival/reset switch. Pressing any standard switch will give a corresponding output from the Output/Receiver. i.e. SW1 will switch channel 1 on the Output/Receiver, SW2 channel 2 etc. The siren switch operates channel 13. Switches 1-12 can be set to latching or momentary operation. Switch 1 and 2 are intended to be used as a light bar front/rear/360 utility as detailed below. The siren switch is only latching. Latching switches once pressed remain active until pressed again; momentary switches are active only when pressed.

999 / Arrival / Reset Switch

- The 999/arrival/reset switch will automatically change its function between three modes of operation:
- Reset; when a key is selected manually or via the arrival button, pressing this key will clear any selected channels.
- 999; when the keypad is clear, pressing this button will activate the pursuit channels. A blue LED will light below the button to indicate this mode is active.
- Arrival; when the keypad is in pursuit (999) mode, pressing this button moves the selection to the preset arrival mode. A red LED will light to indicate that the keypad is in arrival mode. Pressing the button again will clear all channels (reset).
- Walk test; holding the 999/arrival/reset button for two seconds will activate an automatic walk test. This will turn on each channel consecutively for five seconds allowing the user to check the operation of each device on the system. The first channel will stay lit for fifteen seconds to allow the user time to exit the vehicle. Press the reset button to cancel the walk test at any time.

Light Bar 360 Function

Switches 1 and 2 are assigned for use with a light bar. Switch 1 activates the front of the light bar and switch 2 the rear. When both switches are clear, hold switch 1 for 0.5 seconds and it will activate both channel 1 and 2 giving the user a 360 function with one button press. When in 360 mode, hold switch 1 for 0.5 seconds and the keypad will de-activate both channels 1 and 2. The buttons operate as normal in all other situations.

Other Features

A bank of switches can also be set as 'self-cancelling', which means that only one button in the bank can be active at any one time. The keypad has a permanent backlight for low light viewing and each active latching switch is illuminated further when active. Momentary switches are illuminated only when pressed. Under low light conditions a light sensor will lower the illumination intensity of all active switches to prevent driver distraction. The sensor for this is situated at the bottom of the keypad and should not be covered if the Auto Dim feature is to function. Keypad legends can be factory fitted according to the customer's requirements or customer fitted. Soft switching prevents large current surges on the vehicle electrical system by staggering the programmed switch activation.

Power Down and Wake Up Modes

When the battery supply falls below 12 volts, providing no channels are selected, the power down timer will start up. After 20 minutes the unit will power down and disable the keys back lighting. The unit will 'wake up' when a key is pressed or when the battery voltage rises above 13 volts.

When the unit is asleep, pressing any key will wake the unit up but won't turn that channel on. This allows the acts of waking and operating a channel a separate action. The 999/arrival/reset key will however wake the unit up and activate the pre-programmed respond mode, allowing a quick response if required.

If the battery is at or below 12 volts, pressing and holding the reset and siren keys together will put the unit to sleep. If the voltage is too high, the unit will emit a long beep indicating to the user that the switch panel system can't go to sleep.

Power Down and Wake Up Modes

The Keypad incorporates a public address microphone for use with a Woodway siren with PA capability and is made active via a PTT (Press-To-Talk) switch located on the right hand side of the keypad. When the switch is operated it will mute any active siren tones. The volume is factory set to 50% but may be adjusted to suit operator preferences via the keypad.

Audible and Visual Warnings

As a reminder that the panel is active, the LED at the top of the panel will flash and the system will beep every 30 seconds.

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Keypad Programming

WARNING! Keypad programming should only be carried out with either the data wire to the receiver disconnected, or the receiver output connector removed to prevent unintentional operation of the vehicle equipment.

Programming Mode

To prevent accidental modification of the keypads set up, the special programming mode is only accessible via a special key press. Once active the warning LED will remain permanently lit, indicating the unit is not in normal operation.

To enter programming mode: Simultaneously hold channel 2, siren and reset for more than 2 seconds. The battery voltage must be above 12.0 volts (engine running) to prevent the unit instantly going to sleep. When the keys have been pressed long enough the warning LED will light. Once programming is complete the same key press or an interruption to the power will make the unit revert to normal operation.

Modifying 999 and Arrival definitions

Keypad button press to enter/exit programming mode

To reprogram the 999 activated channels follow the procedure above to put the handset into programming mode. When in programming mode, press the 999/arrival/reset switch and the blue LEDs in the switch will light. Press and hold the 999/arrival/reset button until the blue part of the switch and the warning LED starts to flash. Whilst the LED is flashing, depress each key that is part of the intended program so that it is lit up. When finished, press the 999/arrival/reset button and the keypad will move into arrival programming mode. Move on to arrival programming or press 999/arrival/reset again to reset the keypad, then the keypad button press above can be performed to return to normal operation.

To reprogram the arrival activated channels follow the procedure above to put the handset into programming mode (you may already be in programming mode after setting the 999 settings). When in programming mode press the 999/arrival/reset switch twice until the red LEDs are lit then hold the 999/arrival/reset button until the red part of the switch and the warning LED starts to flash. Whilst the LED is flashing, depress each key that is part of the intended program so that it is lit up. When finished, press the 999/arrival/reset button and the sequence will be saved. You can now cycle through the 999/arrival/reset to check your selections are correct and make any adjustments necessary while still in programming mode.

Once programming is complete press the above programming key selection to return to normal operation. Alternatively, remove power from the handset.

Programming Other Options and Groups

Once in programming mode, holding various keys allows certain other parts of the system to be set-up.

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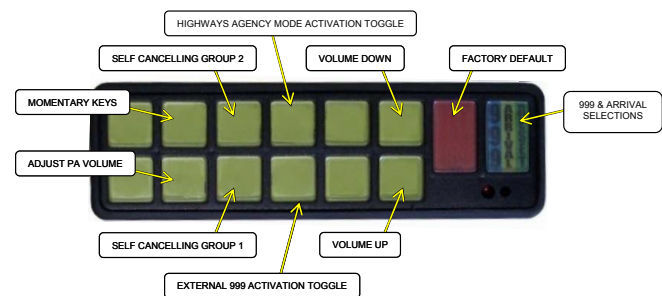
Keypad Programming

Public Address Microphone Volume

To adjust the volume of the internal microphone, enter programming mode (see above). Press and hold the channel 3 key until the unit beeps. This unit will now be in volume adjustment mode. While this mode is active the channel 3 switch will flash. Channel 11 (volume up) and channel 12 (volume down) adjust the microphone volume. Volume adjustment takes around 8 seconds to go from minimum to maximum. When you have finished press the 999/arrival/reset key to save the settings. You may now program another option or perform the programming key press to return to normal operation.

Highways Agency Mode

When in programming mode, button 8 can be held to toggle this function. The LED will either light, to show this mode is active or go out, showing that it is disabled. You will also here a low level bleep when toggling modes. This is programmed the same way as the external 999 switch. When enabled, if the unit is in pursuit mode (999 mode) and +12V is applied to the red/blue 999 wire, the unit will move automatically to arrival mode. If the mode is required on a 0V switched hand brake, a relay will need to be used. Press the 999/ARRIVAL/RESET button to turn all switches off and again to go into 999 mode. You may now program another option or perform the programming key press to return to normal operation. **The external 999 and Highways Agency modes do not operate together, ensure only one mode is activated at one time.**

Self Cancelling Switches

If a group of keys are required to self cancel if one or other in that group is pressed, first enter programming mode (detailed above). Now depress and hold the channel 5 selection key, the warning LED will flash and the keys that are required in the groups can be pressed. The keys in the group will stay lit when selected. When all the keys that are required in the group are lit up, press the 999/arrival/reset button to save the set up and clear the selections. You may now program another option or perform the programming key press to return to normal operation. Two separate groups of self cancelling groups can be defined.

To program self cancelling group 2, enter programming mode, press and hold the channel 6 selection key and repeat the operation above.

If more than one self cancelling group channel is incorporated as part of a 999 or arrival selection, all channels will become active at the same time. It is therefore advised that any self cancelling groups should be defined before the 999 or arrival modes are programmed.

External 999 Activation

When in programming mode, button 7 can be held to toggle this function. The LED will either light, to show this mode is active or go out, showing that it is disabled. You will also here a low level bleep when toggling modes. To use the external 999 function, connect the RED/BLUE wire on the output/receiver module to a momentary switch that is connected to +12V. Hold the switch for more than half a second to activate the 999 mode. Cancel the 999 mode in the usual method, press the 999/ARRIVAL/RESET button to go to arrival mode and press it again to reset the switch panel. You may now program another option or perform the programming key press to return to normal operation. **The external 999 and Highways Agency modes do not operate together, ensure only one mode is activated at one time.**

Momentary Key Selection

Channel keys 1 - 12 can be turned into momentary action keys. When set-up, a channel will only be active whilst the key is pressed. This is useful for creating a button to drive an air horn for example. If this channel happens to be part of the 999 pursuit or arrival selection when activated the channel will come on for a short period and automatically cancel itself.

To program which keys are momentary enter programming mode then hold the button for channel 4 for over 2 seconds until a low level beep is heard and the light goes out. Then select which channels are momentary by turning that channel on. Finally press the 999/arrival/reset key to store the selection. You may now program another option or perform the programming key press to return to normal operation.

Factory Default Set Up

The system can be restored to the factory default set-up by pressing and holding the siren key whilst in programming mode. The factory default set-up is currently defined as follows:

999 Pursuit: 360degree Strobes (front and rear); Channel 3; 4 and Siren On.

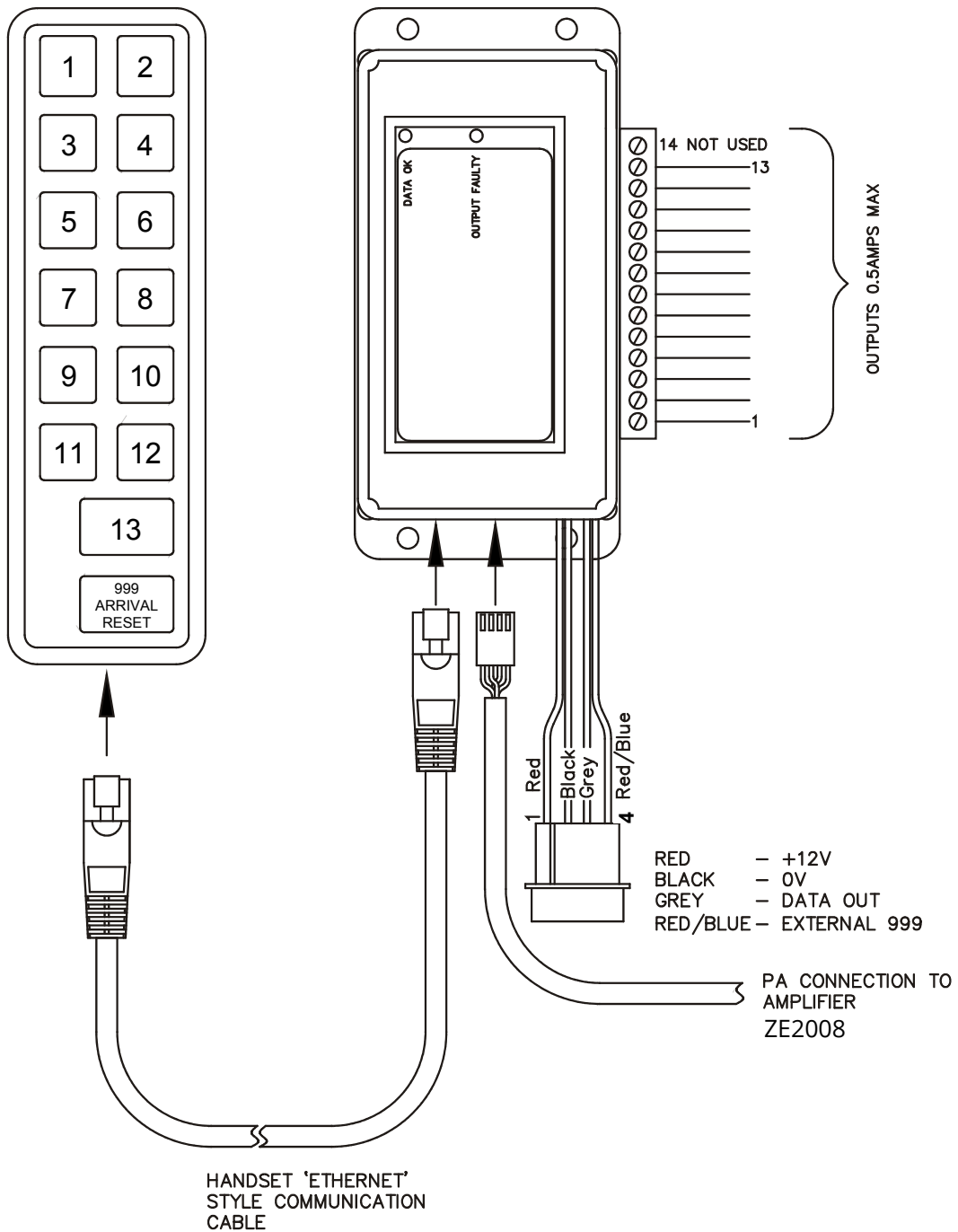Arrival: 360degree Strobes; Channel 4 On; Siren Off.

No momentary keys and self-cancelling groups.
Microphone Volume set at 50%.
External 999 and Highways modes are disabled.

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Troubleshooting

PROBLEM	POSSIBLE CAUSE(S)	SOLUTION(S)
Total system failure.	Blown fuse.	Check power supply and connections to modules.
• Single Switch Operation on handset is ok, but multiple switch operation fails or causes system shutdown. • Light bar control failure.	Communications fault.	• Check data link connections are secure. • Check inputs and cable ends are clean.
	Low Voltage.	Check battery voltage has not dropped below 12V
• Red LED illuminated on Output/Receiver module. • When selecting more than one switch function, some lights are on, others are not. • Light operation appears to be 'haywire'	Excessive current draw on one or more channels (maximum working current is 0.5amps (500mA) per channel).	To locate the faulty channel, operate each switch individually until the Red LED illuminates. • Check for short circuit in wiring. • Check for faulty equipment. If problem still persists, replace Output/Receiver Unit.
No output from Output/Receiver. 'Data OK' LED is not flashing.	Communication fault.	Check data link connections are secure. Check fuse. Check voltage. Check switch panel is plugged in. Is the switch panel damaged or otherwise non functional?
High pitch 'whistle' from the speaker on PA operation.	Volume set too high.	Turn the volume down on the keypad.
	Keypad and speaker too close together.	Increase the physical separation between the keypad and the speaker.
The Keypad LED is flashing.	Low Voltage.	Check that the voltage is healthy. For 12V system = >12V
The Keypad LED is permanently on and the system is not functioning.	Internal eprom fault.	Replace keypad.
One or more switches will not remain on	Switches are set for momentary operation.	Reset the switches to latching operation.
Pressing one switch 'On' turns the previous one 'Off'.	Switches are set to 'self-cancelling'.	Reset the switches.
When selecting '360' the light bar is not functioning.	Switches are incorrectly set.	For the '360' to function correctly when connected to a Woodway light bar only SW1 can be used as 360 and the 'Special Strobe Function' must be set.
Switch panel cannot be programmed.	Keypad has lockout still enabled.	Disable lockout.
When activating external 999, the program activates then immediately goes to arrival mode. When 999 is held, a long tone is heard	The highways agency mode needs turning off.	Toggle highways mode to off.

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System Installation Wiring Diagrams

System Wiring

DATA OK

OUTPUT FAULTY

14 NOT USED
13

OUTPUTS 0.5AMPS MAX

1

1 Red
Black
Grey
4 Red/Blue

RED — +12V
BLACK — 0V
GREY — DATA OUT
RED/BLUE — EXTERNAL 999

PA CONNECTION TO AMPLIFIER

ZE2008

HANDSET 'ETHERNET' STYLE COMMUNICATION CABLE

Keypad buttons: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 999 ARRIVAL RESET

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System Installation Wiring Diagrams

Auxiliary Relays
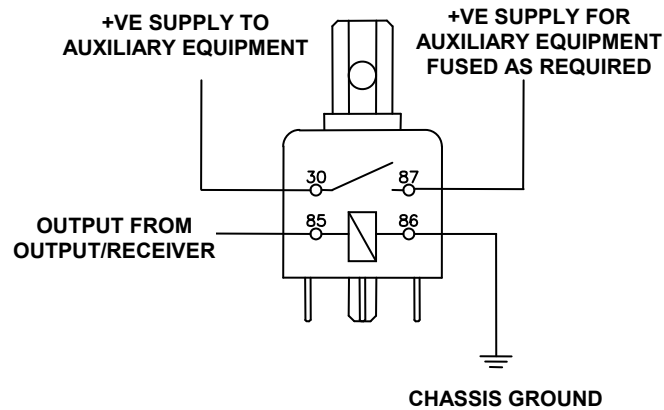
FIGURE 4: OUTPUT/RECEIVER RELAY CONNECTIONS

Beta Siren - Hands Free Control

Figure 5
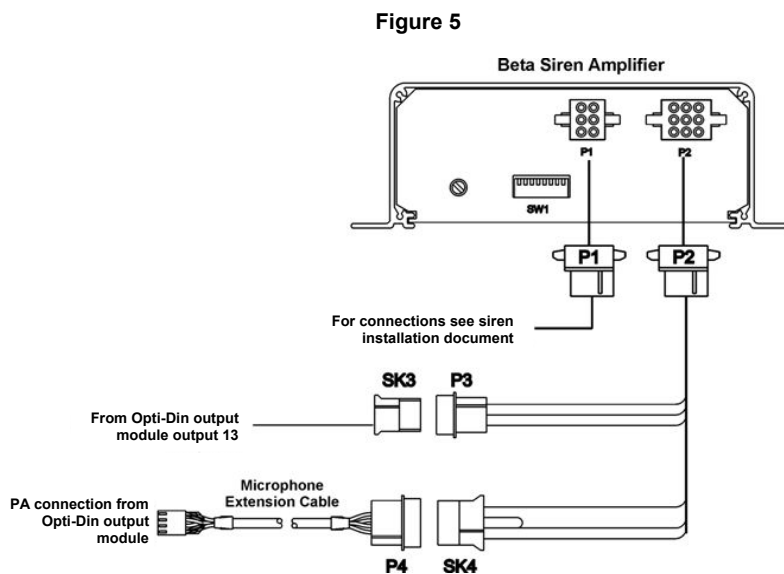
Socket SK3		
Pin	**Wire Colour**	**Function**
1		
2		
3	White/Orange	Hands Free
Plug P3		
Pin	**Wire Colour**	**Function**
1		
2		
3	White/Orange	Hands Free
Socket SK4		
Pin	**Wire Colour**	**Function**
1	White/Blue	Mic +
2	White/Black	Mic -
3		
4	White/Violet	PTT
Plug P2		
Pin	**Wire Colour**	**Function**
1	Red/White	Not Used
2	White/Green	Horn Ring
3	White/Brown	Wail
4	White/Red	Yelp
5	White/Orange	Hands Free
6	White/Yellow	Not Used
7	White/Violet	PTT
8	White/Black	Mic -
9	White/Blue	Mic +

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ISO 9001:2015 Certified

QAS INTERNATIONAL
ISO 9001:2015
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Certificate No. CA15291

2 Year Warranty

2
Year

Warranty