206

VEHICLE DETECTION

Radar Traffic Detector

AGD CERTIFIED
INTELLIGENT DETECTION SYSTEM

PRODUCT MANUAL

AGD®

nqa ISO 9001 Registered Quality Management
UKAS MANAGEMENT SYSTEMS 015

nqa ISO 14001 Registered Environmental Management
UKAS MANAGEMENT SYSTEMS 015

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INTRODUCTION

PRODUCT & TECHNOLOGY

AGD CERTIFIED INTELLIGENT DETECTION SYSTEM

206

This product has been designed for the detection and monitoring of vehicles on the approaches to signalled intersections. The 206 Doppler radar operate in the 10.5GHz band. The detector can be used for the call and/or extension of a signal phase on a one or two lane approach to a given signal.

- Vehicle radar detection for intersection control
- Technically advanced detection platform
- Modern, compact stand-alone detector
- Custom designed planar antenna

KEY FEATURES

- Approaching or bi-directional detection
- Detection range between 60 and 100m (high or low options - model specific)
- Lightweight, compact units for ease of installation
- Low speed threshold of 4kph or 8kph
- LED detect indication to rear
- Power supply options of 24Vac/dc, 40Vac, 110Vac or 230Vac
- Channel frequency selection via switches

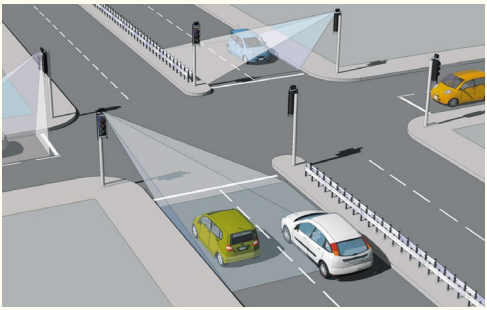
PRODUCT RANGE

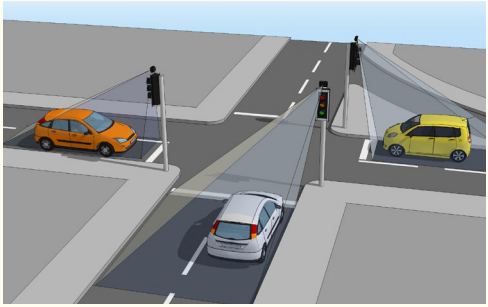
	Series	206-2xx-xxx	206-3xx-xxx	206-4xx-xxx	206-7xx-xxx
Options	24Vac/dc	✓	✗	✗	✗
	42Vac	✗	✗	✗	✓
	110Vac	✗	✗	✓	✗
	230Vac	✗	✓	✗	✗
	Configuration switches	✓	✓	✓	✓

INTRODUCTION

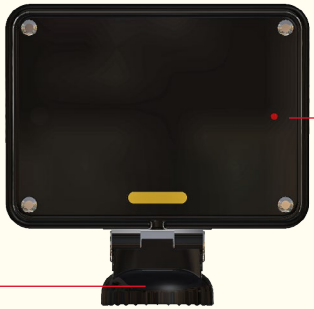
TYPICAL APPLICATIONS

Intersection control





PRODUCT OVERVIEW



24V / 42V versions

230V versions

INTRODUCTION

PRODUCT OVERVIEW

The AGD206 is an above ground dynamic radar vehicle detector. This compact unit featuring a custom planar antenna has been specifically designed to be mounted above the red aspect of a traffic signal pointing towards the oncoming traffic. The detector has a single zone of detection stretching from the radar to typically 60m along the carriageway (specific models can detect up to 100m). An output is generated by the detector as the target travels above the low speed threshold of typically 8kph along the carriageway towards the detector. The detection zone is such that only vehicles approaching the detector are detected and vehicles travelling away from the detector are ignored.

The detector has an access port on the rear of the housing, behind which, a set of switches can be adjusted to alter the detection performance. The parameters which can be altered are the detect direction (Advance or Bi-directional), the low speed threshold (8 or 4 kph), the range (Standard or Low), and operating frequency of the detector (High or Low) to minimize any interference between units. New settings will be implemented when in the non-detect state.

RADAR CHARACTERISTICS

The radar has been designed to have a specific set of functional characteristics which make it suitable for traffic control applications.

Radar Antenna

The antenna is a planar patch array with the following performance;

Parameter	Specified	Notes
Horizontal Beam-width	20°	-3dB (HPBW)
Vertical Beam-width	27°	-3dB (HPBW)
Side-lobe suppression	>20dB	
E-Field	Vertical	Plane polarised

Operating Frequency Band and Power

The 206 radar uses a Phase Locked Loop (PLL) based transceiver design. The hardware of the transceiver has been uniquely designed to operate in the 10.587 to 10.597GHz Band.

Further, the transmission is so narrowly controlled that different 206 would have the potential to mutually interfere. Therefore, all radars for this band have two PLL settings enabled by a switch on the rear of the radar.

For the Frequency Low setting the PLL transmitter is coded to 10.583GHz.
For the Frequency High setting the PLL transmitter is coded to 10.591GHz.

At test, the switch option is set to the Low setting for odd serial number radars and High for even serial numbers.

Parameter	Specified	Notes
Operating Frequency Band	10.587 to 10.597GHz	See also note on Irish Variants
Power	<100mW eirp	Typically 60mW eirp
Field Strength	< 700mV/m	At 3m
ITU Code		

Special Note on Variant Radar for Ireland

A special version of the transceiver hardware has been uniquely designed to operate in the 10.400 to 10.420GHz Band specifically for the Irish COMREG allocated band for radar based traffic control products. In all respects it is the same transceiver with the exception of its functional frequency band of use.

For the Frequency Low setting the PLL transmitter is coded to 10.409GHz.
For the Frequency High setting the PLL transmitter is coded to 10.415GHz.

Similarly at test, the switch option is set to the Low setting for odd serial number radars and High for even serial numbers.

RADAR CHARACTERISTICS

FREQUENCY VARIANTS

Several versions of this product are available at frequency options which are for use in different geographic regions related to the radio requirements of that specific jurisdiction as follows;

Frequency Variant	EU Country of Use	Other Countries	Notes
10.410GHz	IE		
10.475GHz	FI		
10.525GHz	NO,NL,DK,NO,GR*,LT*,MT*,PL*,ES*,SE*,CH*,BG*,	AU, US*	
10.587GHz	GB,NO,DK,NL,BE,GR,LT*,MT*,PL*,ES*,CH*,BG*		

Countries marked with an * please contact AGD for more information.

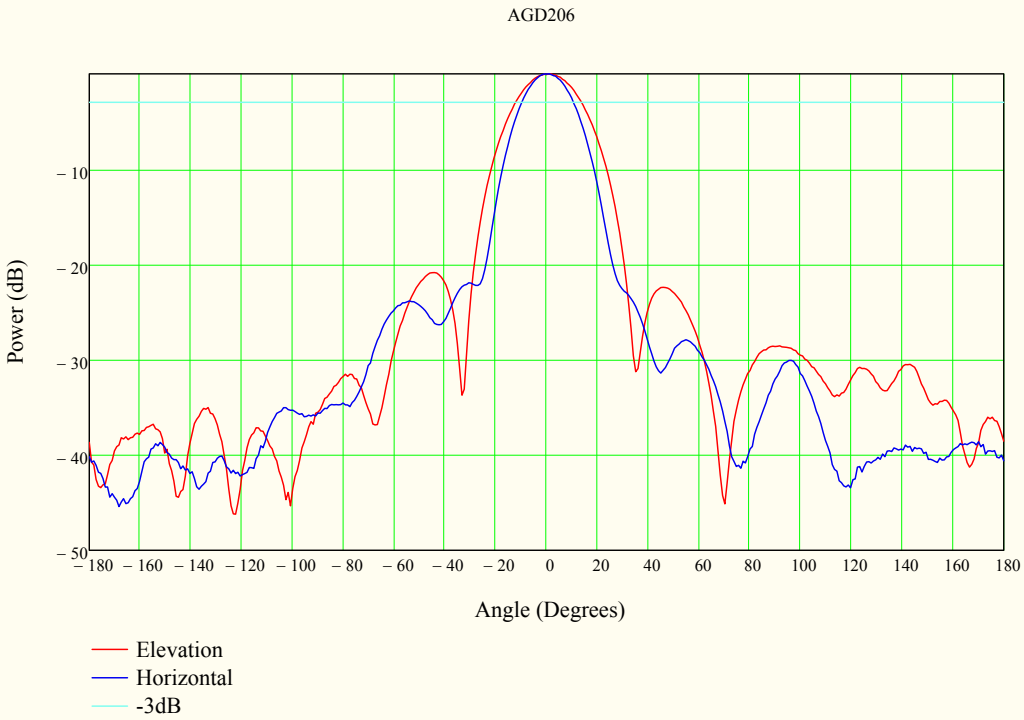
These products may **not** be used in the following geographic regions;

Restriction Type	EU Country	Other Countries
Relevant 10GHz Band not allocated	DE,AT,CZ,IS,TR	
Licence Required for Use		HK
Frequency Allocated but EIRP too high	FR,HU,LU	KR,NZ

It is important to note that this table is updated from time to time. Please contact AGD for latest information if your intended country of use is not currently represented.

(Note: Countries are listed by their ISO 3166 2 letter code)

206 FIELD PATTERN

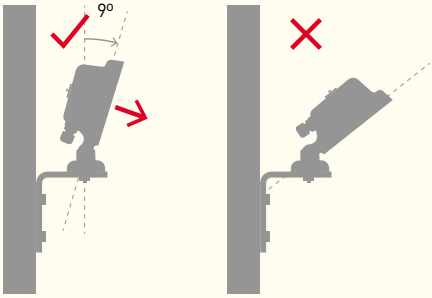


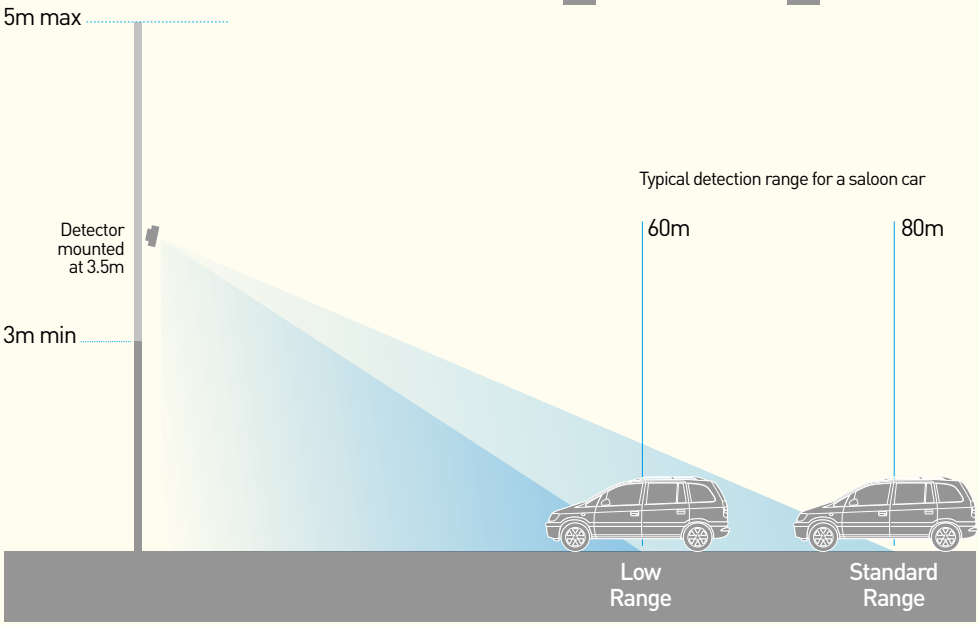
MOUNTING HEIGHT, ANGLES, CLEARANCE

Mount the radar on a firm structure within a recommended height range of 3m-5m. For optimum performance the radar should be situated on a pole adjacent to the carriageway with an **unobstructed** view of advancing traffic. Point the radar down the road towards the furthest point where vehicle detection is required. The front face of the radar should be declined from the vertical at an angle of approximately 9º.

The radar has a relatively wide field of view allowing good vehicle detection coverage of single or dual lane approaches for the applications indicated. Typical ranges are as shown based on the sensitivity setting selected.

The detector should be carefully aligned for optimum performance and is best achieved under light traffic conditions. For the majority of installations where the carriageway is level, the declination can be quickly set by depressing the detector by 9º from the vertical. The detector should be panned to point at the centre of the carriageway at the furthest point at which detection is required. For a twin carriageway approach the detector should be aligned with the road markings separating the two lanes. The LED on the detector should be observed during alignment to ensure the onset of detection occurs at the correct point.

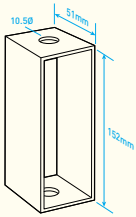




Not to scale

CONNECTING THE DETECTOR

Bulgin connector



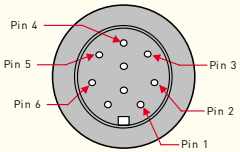
1. Secure detector to top strut of nearside primary signal head pole using HA Approved pan and tilt mounting bracket. If required, to clear obstructions use the optional height extension bracket (BR-129).

2. Ensure radar is **unobstructed** by backing boards

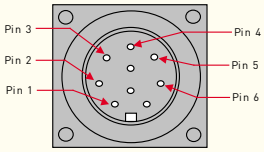
3. The mating bulkhead connector should be fastened to the rear of the signal head on the side furthest from the carriageway using the fasteners provided.

4. The bulkhead connector cable should be routed from inside the signal head to the pole termination.

Pin view of Bulgin connector



Pin view of bulkhead connector



Flying leads

1. Secure detector to suitable bracket fitted to nearside primary signal head pole using the fitted pan and tilt mounting foot. If modular signal head, use height extending bracket available separately (BR-129).

2. Ensure radar is **unobstructed** by backing boards.

3. Connect the unit to power using the 5m flying lead.

4. Connect the detect output relay contacts as detailed.

CONNECTING POWER

- Make sure the power supply is the correct voltage, which can be found on the label on the unit.
- Connect the unit to the supply.
- Once powered, the front and rear LEDs should flash five times whilst the radar performs its self check routines.

POWER & WIRING - 24VAC/DC

24Vac/dc - Bulgin connector or 5m flying lead

The output is an SPCO (SPDT) relay with the impedance state of the relay being the same for a detect state or power off condition. The relay is rated at 1A maximum at 24Vdc. The relay is not rated to switch voltages in excess of 230V (35W max. switched power). Connection is via a Bulgin Buccaneer 9-pin connector as below and on page 7 with pins 7, 8 and 9 not connected.

Upon power up, owing to the nature of the equipment's power supply, an initial current of up to 200mA can be drawn and the supply should be fused appropriately. Current drain for 24Vac is typically 85mA. Current drain in the detect state is approximately 82mA. The installation of this equipment must conform to the latest edition of the IEE Wiring Regulations (BS7671).

Single Cable 24Vac/dc Supply Wiring (1m with Bulgin connector)					
Pin No.	Wire Colour	Function	Power Off	Power On-No Detect	Power On-Detect
1	Red	24Vac or 24Vdc	-	-	-
2	Black	0Vdc / 24Vac	-	-	-
3	Green	Earth / Ground	-	-	-
4	White	Relay Common	-	-	-
5	Yellow	Relay Contact	N/O	N/C	N/O
6	Blue	Relay Contact	N/C	N/O	N/C
7, 8, 9		Not Connected			

Single Cable 24Vac/dc Supply Wiring (5m flying lead)				
Wire Colour	Function	Power Off	Power On-No Detect	Power On-Detect
Red	24Vac or 24Vdc	-	-	-
Black	0Vdc / 24Vac	-	-	-
Green	Earth / Ground	-	-	-
White	Relay Common	-	-	-
Yellow	Relay Contact	N/O	N/C	N/O
Blue	Relay Contact	N/C	N/O	N/C

POWER & WIRING - 42VAC

42Vac - 5m flying lead

The output is an SPCO (SPDT) relay with the impedance state of the relay being the same for a detect state or power off condition. The relay is rated at 1A maximum at 42Vac. The relay is not rated to switch voltages in excess of 110V (35W max. switched power). Connection is via a 5m flying lead as detailed below.

Upon power up, owing to the nature of the equipment's power supply, an initial current of up to 200mA can be drawn and the supply should be fused appropriately. Current drain for 42Vac is typically 62mA in the non-detect state. The installation of this equipment must conform to the latest edition of the IEE Wiring Regulations (BS7671).

Single Cable 42Vac Supply Wiring (5m flying lead)				
Wire Colour	Function	Power Off	Power On-No Detect	Power On-Detect
Red	42Vac	-	-	-
Black	42Vac	-	-	-
Green	Earth / Ground	-	-	-
White	Relay Common	-	-	-
Yellow	Relay Contact	N/O	N/C	N/O
Blue	Relay Contact	N/C	N/O	N/C

POWER & WIRING - 110VAC

110Vac - 5m flying leads

The AGD206 is powered by a 110Vac supply and it is essential that the detector is connected to the correct power supply. Consideration must be given to the multiple grounding of supplies and to its effect on the whole system.

The detector is supplied with two 5m flying leads. One is the power supply for the detector and the other is the signal output and the correct cables should be identified before connection.

The relay is a SPCO (SPDT) type rated at 1A maximum at 24Vdc. The relay is not rated to switch voltages in excess of 110V (35W max. switched power). The installation of this equipment must conform to the latest edition of the IEE Wiring Regulations (BS7671).

Upon power up, owing to the nature of the equipment's power supply, an initial surge current of 40mA can be drawn and the supply should be fused appropriately. Current drain (non-detect state) for 110Vac is 19mA typical.

Twin Cable 110Vac Supply Wiring (5m flying lead)					
Cable	Wire Colour	Function	Power Off	Power On-No Detect	Power On-Detect
Power	White	110Vac Live	-	-	-
	Black	110Vac Neutral	-	-	-
	Green/Yellow	Earth / Ground	-	-	-
Signal	Red	Relay Common	-	-	-
	Blue	Relay Contact	N/C	N/O	N/C
	Green	Relay Contact	N/O	N/C	N/O

110Vac - Single 5m flying lead

The AGD206 is powered by a 110Vac supply and it is essential that the detector is connected to the correct power supply. Consideration must be given to the multiple grounding of supplies and to its effect on the whole system.

The relay is a SPCO (SPDT) type rated at 1A maximum at 24Vdc. The relay is not rated to switch voltages in excess of 110V (35W max. switched power). The installation of this equipment must conform to the latest edition of the IEE Wiring Regulations (BS7671).

Upon power up, owing to the nature of the equipment's power supply, an initial surge current of 40mA can be drawn and the supply should be fused appropriately. Current drain (non-detect state) for 110Vac is 19mA typical.

Single Cable 110Vac Supply Wiring (5m flying lead)				
Wire Colour	Function	Power Off	Power On-No Detect	Power On-Detect
Red	110Vac Live	-	-	-
Blue	110Vac Neutral	-	-	-
Green	Earth / Ground	-	-	-
White	Relay Common	-	-	-
Yellow	Relay Contact	N/O	N/C	N/O
Black	Relay Contact (non HA specified)	N/C	N/O	N/C

POWER & WIRING - 230VAC

230Vac - 5m flying leads

The AGD206 is powered by a 230Vac supply and it is essential that the detector is connected to the correct power supply. Consideration must be given to the multiple grounding of supplies and to its effect on the whole system.

The detector is supplied with two 5m flying leads. One is the power supply for the detector and the other is the signal output and the correct cables should be identified before connection.

The relay is a SPCO (SPDT) type rated at 1A maximum at 24Vdc. The relay is not rated to switch voltages in excess of 110V (35W max. switched power). The installation of this equipment must conform to the latest edition of the IEE Wiring Regulations (BS7671).

Upon power up, owing to the nature of the equipment's power supply, an initial surge current of 40mA can be drawn and the supply should be fused appropriately. Current drain (non-detect state) for 230Vac is 10mA typical.

Twin Cable 230Vac Supply Wiring (5m flying lead)					
Cable	Wire Colour	Function	Power Off	Power On-No Detect	Power On-Detect
Power	Brown	230Vac Live	-	-	-
	Blue	230Vac Neutral	-	-	-
	Green/Yellow	Earth / Ground	-	-	-
Signal	Red	Relay Common	-	-	-
	Blue	Relay Contact	N/C	N/O	N/C
	Green	Relay Contact	N/O	N/C	N/O

POWER & WIRING

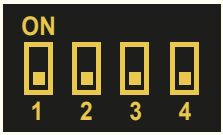
Power Options	24Vdc	24Vac	42Vac	110Vac	230Vac*
Switch only versions	70mA	85mA	62mA	19mA	10mA
Power	1.7W	2.1W	2.1W	2.6W	2.3W
Supply Tolerances	20 -27V	20 - 27V	+/-10%	94 - 126Vac	230V + 10/-6%

*Standard product safety rating 100 - 240Vac

USER CONFIGURATION

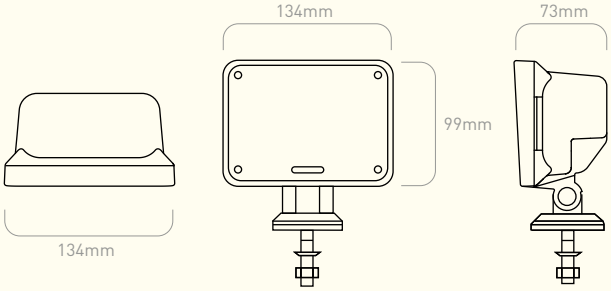
DIP SWITCH FUNCTIONS

DIP Switch (4-way)



DIP Switch number	Parameter	Switch off value (bottom position)	Switch on value (top position)
	Low speed threshold	8kph	4kph
	Detection direction Detect targets that are...	Advance only	Bi-directional
	Sensitivity / range	Standard (Typically up to 80m for a saloon car)	Low (Typically up to 60m for a saloon car)
	Frequency	Low frequency (odd serial no.s)	High frequency (Even serial no.s)

TECHNICAL SPECIFICATIONS



SPECIFICATIONS

Technology	CW Doppler Radar
Frequency	10.577 to 10.597GHz (see option 3)
Range/Zone	Up to 80m (or user selectable to low range)
Mounting Height	3-5m nominal
Low Speed Threshold	4 or 8 kph (user selectable)
Direction	Advance or bi-directional (user selectable)
Weight	900g Nominal
Housing Material	Die Cast Aluminium Alloy
Housing Finish	High quality, exterior finish, black polyester powder-coat paint
Sealing	IP67
Operating Temperature	-20°C to +60°C
Power Supply	24V ac/dc (see option 1)
Current	85mA typ. (24Vac)
Detect Output	SPCO Relay (SPDT) (see option 2)
Configuration Interface	DIP switch access on rear face
MTBF	>20 years based on field data from 16000 units installed over 5 years
EMC Specification	ETSI EN 301 489/BS EN50293
Radio Specification	ETSI EN 300 440
Electrical Safety	BS EN60950
HA Specification	TR2505 Dynamic

OPTIONS

1. Power supply options of 42Vac, 110Vac or 230Vac available.
2. Opto isolator output options available on request.
3. Frequency option preset to suit local requirements. See Radar Characteristics section for typical frequency ranges.

ACCESSORIES

CA-083	Mating Bulgin connector complete with 1.5M cable
BR-129	Height extension bracket

Owing to the Company's policy of continuous improvement, AGD Systems Limited reserves the right to change their specification or design without notice.

RoHS COMPLIANT
Restriction on Hazardous Substances

TROUBLESHOOTING

MOUNTING

What height should the AGD206 be mounted at?

The recommended mounting height for the 206 is typically 3-4 metres from ground level for optimum performance, however it can also be used at heights lower than this for other applications such as car parks/barrier systems etc.

Is there a recommended angle that the AGD206 should be set to?

The 206 should be carefully aligned for optimum performance and is best achieved under light traffic conditions. For the majority of installations where the carriageway is level, the declination can be quickly set by depressing the detector by 9º from the vertical as indicated on page 6.

The detector should be panned to point at the centre of the carriageway at the furthest point at which detection is required. For a dual carriageway approach the detector should be aligned with the road markings separating the two lanes. The LED on the detector should be observed during alignment to ensure the onset of detection occurs at the correct point.

DETECTION ZONES & SWITCH SETTINGS

How many lanes of traffic can the AGD206 detect vehicles in?

The 206 can detect traffic for 1 or 2 lanes of a carriageway.

What distance can the AGD206 detect vehicles to from its mounting position?

In its default setting the 206 can detect vehicles up to 80 metres away from its mounting position with user selectable function Switch 3 set to the default position of 'OFF'. With Switch 3 set to 'ON' the range of the 206 is then reduced to approximately 60m.

Can the AGD206 detect vehicles in both directions?

Yes, the 206 user selectable function Switch 2 set to 'ON' will allow vehicles both approaching and receding from the unit to be detected (bi-directional). For example; this function is regularly deployed on traffic signals where the control of two way traffic across a single lane such as 'shuttle working bridges' is required.

What speeds can the AGD206 detect vehicles at?

The 206 has two speed thresholds on user selectable Switch 1. The default setting of 8 kph is 'OFF', or a lower setting of 4 kph is achieved when Switch 1 is set to the 'ON' position. A detection output will only be activated if a vehicle is travelling faster than the set low speed threshold.

TROUBLESHOOTING

SITE SET-UP

Will the AGD206 still operate correctly when mounted behind a signal head backing board?

When mounted behind a signal head backing board the 206 will appear to function correctly, as it is transmitting a radio signal (RF). However this transmitted RF signal through the backing board material will be attenuated and can cause loss of detection (gapping out), shorter detection range and spurious reflections giving false detect states. The BR-129 height extension bracket supplied should be used to raise the unit up **above** the backing board.

If two AGD206's are facing each other (i.e. shuttle working on a bridge) do they need to be odd and even serial numbers like the earlier AGD200's?

On the earlier AGD200 if two units were to face each other in this scenario then you would need to deploy one unit with an odd serial number and one with an even serial number to remove the potential for crosstalk with each other. With the 206 this is achieved by making sure that user selectable frequencies on Switch 4 are set to 'ON' on one unit and 'OFF' on the second unit of the pair.

Can the AGD206 detect bicycles?

Yes it will detect bicycles, however as a bicycle is a smaller target than a saloon car it probably won't be detected at 60 metres away from the mounting position.

With the AGD206 set to 4kph (Switch 1 set to 'ON'), will it detect walking pedestrians?

A speed of 4 kph equates to roughly 2.5 mph, so if someone is walking fairly briskly, they may be detected by the 206 if they go above this low speed threshold.

Why can't a simple hand-wave test be carried out on the AGD206, the same as I could on the earlier AGD200?

The 206 employs a planar antenna and detection algorithm software that is optimised only for the profile of moving vehicles. Waving a hand in front of the 206 does not produce a suitable profile which the unit would recognise as a valid target and will be ignored. This is very good for filtering out unwanted targets such as moving tree branches close to the detector which the previous AGD200 model could not achieve.

My radar appears to detect rain?

These radars are susceptible to heavy driving rain (False Positive).
(False Positive means there is an output from the radar with no valid target conditions)
The weather conditions are likely to be quite extreme to trigger this.
The only remedy on the 206 to reduce the occurrence is as follows;

1. Set the radar to approach detect (not bi-directional).
2. Set the sensitivity to the lowest possible setting (shortest range).
3. Set to the highest Low Speed Threshold (8km/hr not 4km/hr)

If the incidence of False Positive is still too high with these settings a more sophisticated radar help overcome these issues – please contact AGD for further information.

MISCELLANEOUS

MISCELLANEOUS AND POWER RATING

What is the power consumption of the AGD206?

The 206's power consumption is 1.7 watts @ 24Vdc and is significantly lower than its predecessor the AGD200.

What is the Elexon Code for the AGD206?

Please visit the Elexon website at: www.elexon.com

Does the detector have a hold time after the target has exited the zone?

Yes the standard detector comes with an in-built 500mS hold time. A 230Vac variant for Australia (AGD206-306-000) has a reduced hold time of 100mS.

MAINTENANCE

MAINTENANCE

Users should inspect on an annual basis the security of all cable connections to the detectors. The fixing nut of the mounting foot should also remain securely tightened. Ensure 'full' tightening of the knurled knob/blanking plug in the rear housing to avoid water ingress following any adjustment of the switch settings.

MANUFACTURING TEST PROCESS

TEST EQUIPMENT:	APOLLO™		AGD INTELLIGENT DETECTION SYSTEMS
PRODUCT TEST:	202 | 206		APOLLO was designed and developed by AGD Systems
TEST FUNCTION:	• Signal size and direction control • Full FFT analysis of known frequencies	• Optimisation of frequency signals • Test cycle time of 7 minutes	

Apollo™ is a bespoke set of test equipment designed and developed by AGD Systems. It is dedicated to the testing of the 206 detector range and 100% of these units manufactured at AGD are Certified by Apollo.

The key test functions performed by Apollo to Certify the premium performance of your Intelligent Detection System are:

- Full FFT analysis of known frequencies
- Optimisation of frequency signals
- Transmitted radar power and frequency measurement
- Radar signal to noise level measurement
- Verification of DIP switch parameter operation
- >15hr hour burn-in
- Test cycle time of 7 minutes

The 10.5GHz microwave simulator employed within the Apollo test equipment provides good control of simulated targets signal size and direction during the test cycle.

Optimisation of frequency signals on Apollo ensures full compatibility with different country requirements within the 10.5GHz radar operating band.

All DIP switch parameters and detect output LED operation are verified during the test cycle.

100%

APOLLO is a bespoke set of test equipment designed and developed by AGD Systems dedicated to the testing of the 206 detector range. 100% of these units manufactured at AGD are Certified by Apollo

AGD CERTIFIED
INTELLIGENT DETECTION SYSTEM

LIFETIME PRODUCT TRACEABILITY

There are clearly defined pass and fail criteria at all stages within the Apollo test process. The test results in association with the product build revision are recorded on a product serial number basis. The full suite of test measurements is instantly sent to the dedicated product database within the AGD secure server facility, providing full traceability during the product lifetime.

The AGD Certified symbol is your mark of assured performance.

IMPORTANT SAFETY INFORMATION

SAFETY PRECAUTIONS

All work must be performed in accordance with company working practices, in-line with adequate risk assessments. Only skilled and instructed persons should carry out work with the product. Experience and safety procedures in the following areas may be relevant:

- Working with mains power
- Working with modern electronic/electrical equipment
- Working at height
- Working at the roadside or highways

1. This product is compliant to the Restriction of Hazardous Substances (RoHS - European Union directive 2011/65/EU).

2. Should the product feature user-accessible switches, an access port will be provided. Only the specified access port should be used to access switches. Only non-conductive tools are to be used when operating switches.

3. The product must be correctly connected to the specified power supply. All connections must be made whilst the power supply is off or suitably isolated. Safety must take always take precedence and power must only be applied when deemed safe to do so.

4. No user-maintainable parts are contained within the product. Removing or opening the outer casing is deemed dangerous and will void all warranties.

5. Under no circumstances should a product suspected of damage be powered on. Internal damage may be suggested by unusual behaviour, an unusual odour or damage to the outer casing. Please contact AGD for further advice.

LOW POWER NON-IONISING RADIO TRANSMISSION AND SAFETY

Concern has been expressed in some quarters that low power radio frequency transmission may constitute a health hazard. The transmission characteristics of low power radio devices is a highly regulated environment for the assurance of safe use.

There are strict limits on continuous emission power levels and these are reflected in the testing specifications that the products are approved to. These type approval limits are reflected in the product specifications required for a typical geographic area such as those for the EU (ETS300:440), for the USA (FCC part 15c) and for Australia/ New Zealand (AS/NZS 4268). The limits adopted in these specifications are typically replicated in many other localized specifications.

The level of safe human exposure to radio transmission is given by the generally accepted guidelines issued by the International Commission on Non-Ionizing Radiation Protection (ICNIRP). This body has issued guidance for limiting exposure to time-varying electric, magnetic and electromagnetic fields (up to 300 GHz) which are quoted below.

	Radar and ICNIRP limit comparison			Typical Informative Limits for Radar Transmission Approval		
	Radar Transmitted Level (Note 4)	ICNIRP Limit (Table 6)	Exposure Margin	ETS300:440	FCC (part15c)	AS/NZS 4268
Power (mW EIRP)	<100mW (<20dBm)	N/A	N/A	100mW (20dBm)	1875mW (Note 1)	100mW (20dBm)
Max Power Density (mW/cm2)	3.18µW/cm2 at 50cm (Note 3)	<50W/m2 (5mW/cm2) (Note 2)	0.064%	N/A	N/A	N/A
Field Strength (V/m) at 3m	<0.58V/m (5.8mV/cm) (Note 1)	<137V/m (1370mV/cm)	0.42%	0.58V/m (5.8mV/cm) (Note 1)	2500mV/m (25mV/cm)	0.58V/m (5.8mV/cm) (Note 1)

Note 1 Values are calculated conversions for comparison purposes.

Note 2 Other equivalent limits include; Medical Research Council Limit of 10mW/cm^2, IACP limit of 5mW/cm^2 (at 5cm) and UK CAST limit of 5mW/cm^2

Note 3 Calculation is made on the assumption antenna is a point source therefore the actual value is likely to be significantly less than that quoted. Note that a theoretical max level at a 5cm distance (which gives 0.318mW/cm^2) is at a point in the field where the radar beam is not properly formed.

Note 4 Comparison for product model 206 operating in the band typically 10.577GHz to 10.597GHz

From the table it can be seen that it is extremely unlikely that a potentially hazardous situation could occur owing to the use of such low power devices.

It is considered to be good practice not to subject humans to radiation levels higher than is necessary. In a works environment where multiple equipment on soak test are to be encountered then it is considered good practice to contain the equipment in an appropriate enclosure lined with radar absorbing material.

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DECLARATION OF CONFORMITY

Certificate No: CE-033 Issue: 5

We AGD SYSTEMS LTD
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UNITED KINGDOM

as manufacturer hereby declare that the following product(s)

Equipment Model Type: AGD 206-2xx-xxx, AGD 206-3xx-xxx, AGD 206-4xx-xxx
AGD 206-5xx-xxx, AGD 206-7xx-xxx

Equipment Description: Vehicle Detector for Permanent Traffic Signals

conform with the provisions of the following EC Directive(s), including all amendments, and with national legislation implementing this / these directive(s): 1999/5/EC relating to Radio & Telecommunications Terminal Equipment, 2004/108/EC relating to Electromagnetic Compatibility and 2006/95/EC relating to Low Voltage Directive (Safety)

Standards Applied:
EN300 440-1 V1.6.1
EN300 440-2 V1.4.1
EN301 489-3 v1.6.1
EN60950-1 (2001)

The radiated power of the radar antenna module is up to a maximum of 100mW eirp.

For product in the 10.577GHz to 10.597GHz band the eirp is 38.9mW (UK)
For product in the 10.500GHz to 10.600GHz band the eirp is 40.27mW (EU)
For product in the 10.40GHz to 10.42GHz band the eirp is 25.11mW (Ireland)
For product in the 10.450GHz to 10.500GHz band the eirp is 42.65mW (Finland)

And, where specified below the product(s) also conform with the National and / or International standards and specifications shown

EMC: BSEN50293:2001 Electromagnetic Compatibility - Road Traffic Signal Systems - Product Standard.

Highways Agency: TR2505:2005 Performance Specification for Above Ground Vehicle Detector Systems for use at Permanent Traffic Signal Installations

Signed Dated: 1-11-12

For and on behalf of AGD Systems Ltd
P M Hutchinson
Managing Director

THE QUEEN'S AWARDS FOR ENTERPRISE: INNOVATION 2011

Registered in England and Wales
Number 2666988

DISCLAIMER

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WARRANTY

All AGD products are covered by a 12 month return to factory warranty. Products falling outside this period may be returned to AGD Systems for evaluation, repair, update or re-calibration, any of which may be chargeable.

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