

## Heimdall Radar Traffic Detector

### Single Lane VA Detector Installation Guide

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## 1 General

The Heimdall Above Ground Vehicle Detectors have been developed to provide the complete range of detection systems used in a modern traffic/pedestrian control installation.

They incorporate 'state of the art' radar antenna designs tailored to the specific requirements for each detector type.

All detectors are housed within the same style of enclosure and are of minimal size to reduce the 'eye clutter' associated with older types of equipment.

All detectors can be readily installed onto both new and existing traffic signal control poles.

Detectors come supplied with a standard interface cable together with the HA specified Bulgin Buccaneer connector. Existing sites can easily be upgraded with the Heimdall detector as the detector is compatible with existing above ground units.

### 1.1 Part number

Part Number	Description
667/1/31900/01x	Single Lane VA Approach Detector

**Note:** In the above table 'x' relates to the particular option installed, thus:

- 0 – Basic Detector
- 1 – Basic Detector with RS485 Interface (SiTOS)
- 2 – Basic Detector with Wireless Interface
- 3 – Basic Detector with 2<sup>nd</sup> Output
- 4 – Basic Detector with 2<sup>nd</sup> Output + Wireless Interface

### 1.2 Tooling requirements

As well as a standard Installers tool kit, the following are required when installing or maintaining a Heimdall Detector:

1. 2mm Allen key – for side access door and lid
2. T-8 Torx driver – alternative tool for side access door and lid.
3. 13mm Socket spanner - for angular adjustment and installation of detector.
4. 19mm Ring spanner - for cable gland (DE only).
5. Small flat bladed screwdriver – for DIP switch adjustment.

### 1.3 Performance Details

<b>Operating Range:</b>	At least 10m to 35m from the Stop Line.
<b>Lane Width:</b>	Typically 3.5m.
<b>Vehicle Approach Speed Range:</b>	8Km/Hr (5 MPH) to greater than 112Km/Hr (70 MPH).
<b>Detector Location:</b>	Can be located on either the 'nearside' primary signal pole or the 'off-side' primary signal pole.
<b>Detector Mounting Height Range:</b>	Various Pole heights (above the ground) can be accommodated from 3.3m to 4.0m

### 1.4 Electrical Details

The Heimdall detector is capable of being powered from either:

- (a) 24V AC  $\pm$  20% (48 to 63 Hz), or
- (b) 10.8V to 24.8V DC
- (c) 24V Full wave rectified  $\pm$  20%. From Siemens ELV controller

For information relating to the following:

1. Power consumption requirements of this model.
2. 24V AC & DC power supply options.
3. Permissible detector supply cable lengths.
4. Calculating 24V AC & DC supply cable feeds.
5. Cable length 'look up tables'.

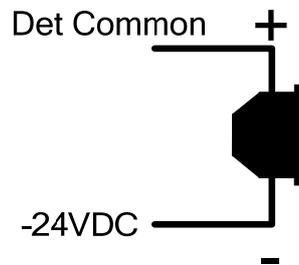
Please refer to the '**Heimdall General Handbook**' (667/HB/31900/000).

## 2 Detector Installation

### 2.1 Electrical Connections

#### Important Notes:

- a) When connecting this detector to a 24V AC source, please ensure that the 24V AC source is derived from an earthed secondary transformer (as used in standard traffic installations).
- b) Particular attention should be paid to the correct termination of the power supply wires. The RED wire should be used for the 24V AC/DC supply feed and the Black wire for the EARTHED supply return.
- c) When using a 24V AC supply, only use battery powered interface equipment (e.g. laptop, PDA). Do not connect mains powered/connected equipment to the Heimdall series of detectors, as this will cause the detectors to fail.
- d) When installing this detector with a Siemens ELV controller or a Siemens ELV controller additional supply, please ensure the RED wire of the interface cable is connected to the POSITIVE (common) connector, the BLACK wire is connected to the NEGATIVE (-24VDC) source and the GREEN (screen) is connected to the POSITIVE (common) connector.

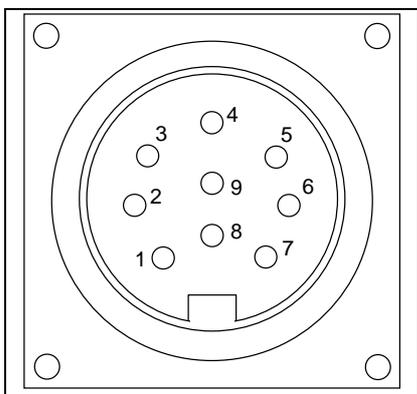


**Figure 2-1 Connection of Heimdall detector to Siemens ELV controller**

#### 2.1.1 9-Pin 'Buccaneer' connector

All Heimdall detectors are equipped with a captive lead and a standard 9 pin 'Buccaneer' connector (see Error! Reference source not found., below).

The pin out for this connector is as specified in the Highways Agency Specifications: TR2505, TR2506 & TR2507. The Heimdall series of detectors provide additional facilities, to that specified in the HA documents, using the spare connections within the 9 way connector. These are outlined in the sections below.



**Figure 2-2 Buccaneer Bulkhead Connector (front view)**

For the Helios Signal Head the Heimdall bulkhead connector cable is generally fitted to the topmost indent on the red Aspect (either side). The hole should be drilled using the rear drill start point. For other signal head suppliers, please refer to the relevant documentation supplied with their products.

The wires from this connector should be terminated in accordance with the details shown in the sections below.

## 2.1.2 Output Cable (Standard)

**Table 1:** Output Cable (Standard) configuration – for variants: 667/1/31900/xx0 & /xx2.

Connector Pin No.	Comment	Colour Code
1	Detector Supply (24V AC/DC)	Red
2	Detector Supply Common (0v)	Black
3	Screen	Green
4	Detector O/P #1&2 (Common)	White
5	Detector O/P #1 (Normally Open)*	Yellow
6	Detector O/P #1 (Normally Closed)*	Blue
7	Not Used	Violet
8	Not Used	Orange
9	Not Used	Brown

**Note:** \* This signal condition refers to the state when the detector is un-powered (detect state).

## 2.1.3 Output Cable (with SiTOS)

**Table 2:** Output Cable (with SiTOS) configuration – for variant: 667/1/31900/xx1.

Connector Pin No.	Comment	Colour Code
1	Detector Supply (24V AC/DC)	Red
2	Detector Supply Common (0v)	Black
3	Screen/ RS485 Ground	Green
4	Detector O/P #1&2 (Common)	White
5	Detector O/P #1 (Normally Open)*	Yellow
6	Detector O/P #1 (Normally Closed)*	Blue
7	Detector O/P #2 (Normally Open)*	Violet
8	SiTOS RS485 (Terminal A)	Orange
9	SiTOS RS485 (Terminal B)	Brown

**Note:** \* This signal condition refers to the state when the detector is un-powered (detect state).

## 2.1.4 Output Cable (with isolated 2<sup>nd</sup> detector O/P)

**Table 3:** Output Cable (with isolated 2<sup>nd</sup> detector O/P) configuration – for variants: 667/1/31900/xx3 & /xx4)

Connector Pin No.	Comment	Colour Code
1	Detector Supply (24V AC/DC)	Red
2	Detector Supply Common (0v)	Black
3	Screen	Green
4	Detector O/P #1 (Common)	White
5	Detector O/P #1(Normally Open *)	Yellow
6	Detector O/P #1(Normally Closed *)	Blue
7	Detector O/P #2 (Common)	Violet
8	Detector O/P #2 (Normally Open *)	Orange
9	Detector O/P #2 (Normally Closed *)	Brown

**Note:** \* This signal condition refers to the state when the detector is un-powered (detect state).

## 2.2 DIP Switch Settings

All Heimdall detectors are equipped with switches that enable the unit to be installed, for the majority of applications, without the need for any special terminal (handset) equipment.

Access to these switches is gained by removal of the side cover. Before removal, note the cover's orientation and ensure it is replaced the same way round.

The switches on the first PCB (Digital Processor) control the basic functions of this detector and are as listed in the following table:

**Note: Default settings are with all DIP switches set to '0'/ OFF.**

DIP Switch Number							
1	2	3	4	5	6	7	8
<b>SW 1, 2:</b> <b>Detection Direction</b> <b>0, 0</b> = Detects vehicles moving towards unit (default) * <b>0, 1</b> = Detects vehicles moving away from unit * <b>1, 0</b> = Detects vehicles moving in both directions (single o/p) ** <b>1, 1</b> = Detects vehicles moving in both directions (dual o/p) ** 1		<b>SW 3, 4:</b> <b>Detector LED</b> <b>0, 0</b> = Normal Detector O/P <b>0, 1</b> = Permanently Off <b>1, 0</b> = Detector O/P for 20 mins. after power applied <b>1, 1</b> = Normal Detector O/P		<b>SW 5:</b> <b>Detection Threshold</b> <b>0</b> = 5.3 mph (8.5 km/h) <b>1</b> = 2.5 mph (4km/h)	<b>SW 6:</b> <b>Detection Range</b> <b>0</b> = Full <b>1</b> =Reduced	<b>SW 7:</b> <b>DFM</b> <b>0</b> = Default monitor time (20hours inactive) <b>1</b> = 'fault monitor time' is set by the Engineers Terminal	<b>SW 8:</b> <b>Remote Configuration</b> <b>0</b> = Disabled <b>1</b> = Enabled

<sup>1</sup> = This option requires a special I/O board to be fitted. In this dual output mode, detector o/p 1 will detect vehicles moving towards the unit and detector o/p 2 will detect vehicles moving away.

**Key:**

<b>0</b>	OFF
<b>1</b>	ON
<b>*</b>	Unidirectional detection
<b>**</b>	Bidirectional detection

**Note:** The switches provided on the second PCB (Special I/O) control the operation of the Siemens Serial Interface (SiTOS) and detail of these settings can be found in the '**Heimdall General Handbook**' (667/HB/31900/000).

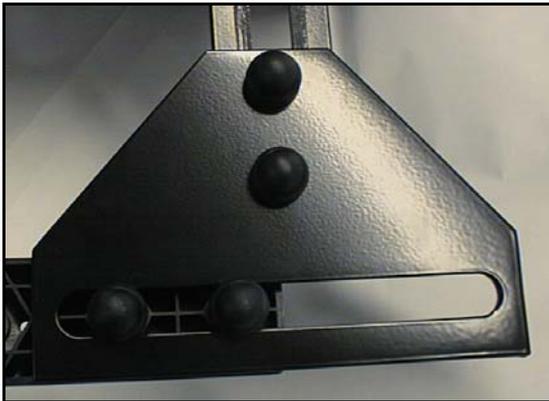
## 2.3 Detector mounting methods

1. When mounting to a Siemens Helios Signal Head, the Heimdall Above Ground Detector can be mounted in the slot on the top bracket, as shown in **Figure 2-3**, below.



**Figure 2-3**

2. Alternatively, a side mounting bracket can be fitted on top of the head fixing bracket, thus providing a slot and two holes for attaching the detector to, as shown in **Figure 2-4**, below.



**Figure 2-4**

3. Existing signal heads from a range of manufacturers may employ a mounting position which causes the detector to be 'masked' by the head's 'backing board'. In this situation a Heimdall Spacer Bracket Kit (667/1/31942/000) must be used. A typical installation of this kind is shown in **Figure 2-5**, below.



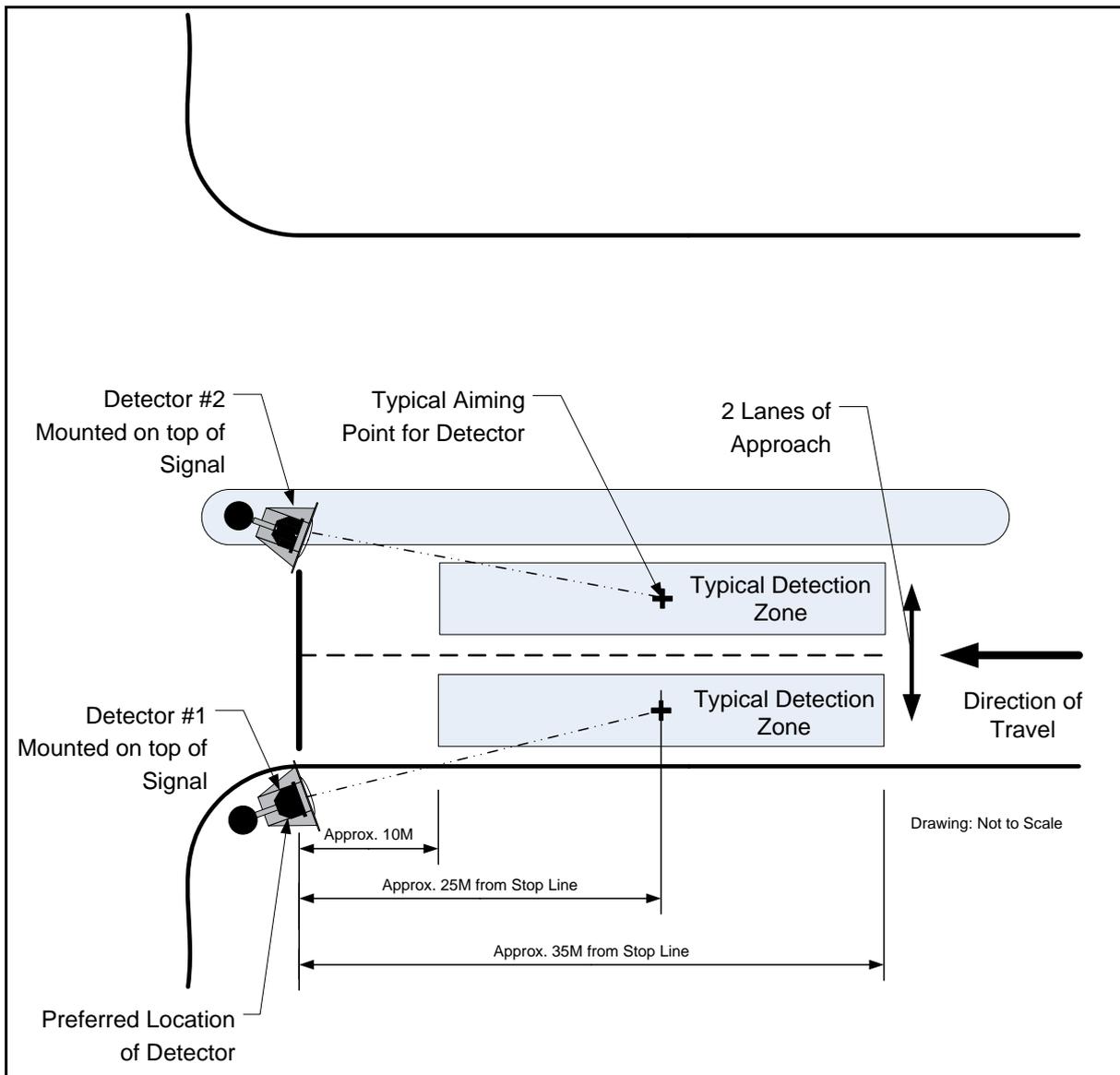
**Figure 2-5**



## 2.4 Detector alignment

When aligning the detector always ensure the following:

1. There is a good line of site between the detector and point of detection with no obstructions such as signs, trees, etc.
2. There is sufficient strain relief and no risk of entrapment or pinching of the detector cables when installing or aligning the detector on a pole.
3. The detectors are located:
  - a. On the nearside primary signal pole (detector #1) for a 'nearside lane' detection.
  - b. On the offside primary signal (detector #2) for an 'outside lane' detection.
4. The detectors are 'aimed' at a position approximately 25 metres from the associated 'stop line', as shown below (**Figure 2-6**).



**Figure 2-6 Typical detection zones**

## Installation ‘Quick Reference’ Guide

### Electrical Connections

#### Important Notes:

- When connecting this detector to a 24V AC source, please ensure that the 24V AC source is derived from an earthed secondary transformer (as used in standard traffic installations).
- Particular attention should be paid to the correct termination of the power supply wires. The RED wire should be used for the 24V AC/DC supply feed and the Black wire for the EARTHED supply return.
- When using a 24V AC supply, only use battery powered interface equipment (e.g. laptop, PDA). Do not connect mains powered/connected equipment to the Heimdall series of detectors, as this will cause the detectors to fail.

All Heimdall detectors are equipped with a captive lead and a standard 9 pin ‘Buccaneer’ connector. The pin out for this connector is as specified in the Highways Agency Specifications: TR2505, TR2506 & TR2507. The Heimdall series of detectors provide additional facilities, to that specified in the HA documents, using the spare connections within the 9 way connector.

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The wires from this connector should be terminated in accordance with the details shown in the table below.

#### Output Cable (Standard)

Output Cable (Standard) configuration – for variants: 667/1/31900/xx0 & /xx2.

Connector Pin No.	Comment	Colour Code
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7	Not Used	Violet
8	Not Used	Orange
9	Not Used	Brown

**Note:** \* This signal condition refers to the state when the detector is un-powered (detect state).

For pinout and wiring details of the output cable for either the SiTOS or 2<sup>nd</sup> output detector options, please refer to **section 2.1.3 & 2.1.4** of this installation guide.

### DIP Switch Settings

All Heimdall detectors are equipped with switches that enable the unit to be installed, for the majority of applications, without the need for any special terminal (handset) equipment.

Access to these switches is gained by removal of the side cover. Before removal, note the cover’s orientation and ensure it is replaced the same way round.

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*	Unidirectional detection
**	Bidirectional detection

**Note:** The switches provided on the second PCB (Special I/O) control the operation of the Siemens Serial Interface (SiTOS) and detail of these settings can be found in the ‘**Heimdall General Handbook**’ (667/HB/31900/010).

### Detector Mounting Methods

1. When mounting to a Siemens Helios Signal Head, the Heimdall Above Ground Detector can be mounted in the slot on the top bracket, as shown in **Figure 1**, below.
2. Alternatively, a side mounting bracket can be fitted on top of the head fixing bracket, thus providing a slot and two holes for attaching the detector to, as shown in **Figure 2**, below.
3. Existing signal heads from a range of manufacturers may employ a mounting position which causes the detector to be 'masked' by the head's 'backing board'. In this situation a Heimdall Spacer Bracket Kit (667/1/31942/000) must be used. A typical installation of this kind is shown in **Figure 3**, below.



Figure 1

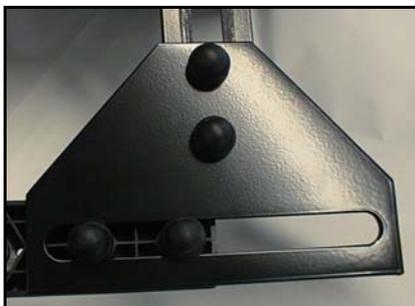


Figure 2



Figure 3

### Detector Alignment

When aligning the detector always ensure the following:

1. There is a good line of site between the detector and point of detection with no obstructions such as signs, trees, etc.
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4. The detectors are 'aimed' at a position approximately 25 metres from the associated 'stop line', as shown in the diagram below.

