Heimdall Radar Traffic Detector

Traffic Data Detector Installation Guide

Document Authorisation			
Role	**Name**	**Function**	**Signed**
Prepared by:	R. Martin	Project Support Manager	
Reviewed by:	A. Rhodes	Lead Product Engineer	
Reviewed by:	A. White	Product Design Manager	
Authorised by:	C. Whipps	Technical Support Manager	

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Contents

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
667/1/31900/07**x**	Traffic Data 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 2nd Output
4 – Basic Detector with 2nd 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

Operating Range:	Not applicable as the detector will be located above the lane being assessed.
Lane Width:	Typically 3.5m.
Vehicle Approach Speed Range:	0Km/Hr (0 MPH) to greater than 112Km/Hr (70 MPH)
Detector Location:	Typically mounted on a gantry to place the detector centrally over the lane being assessed.
Detector Mounting Height Range:	Various heights (above the ground) can be accommodated from 3.0m to 7.0m.
Data Collected:	Vehicle Classification (2+1); Vehicle Counts and Detector Occupancy. Requires the use of a SiTOS enabled I/O board (see ***Section 2.3***, below).

1.4 Electrical Details

The Heimdall detector is capable of being powered from either:

(a) 24V AC ± 20% (48 to 63 Hz), or
(b) 10.8V to 24.8V DC
(c) 24V Full wave rectified ± 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

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.**

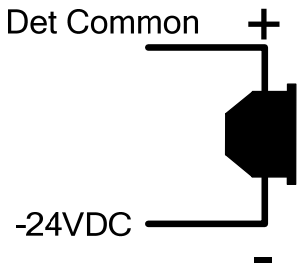


Figure 2-1 Connection of Heimdall detector to Siemens ELV controller

2.1.1 9-Pin 'Buccaneer' connector

All Heimdall detectors are equipped with a captive lead and a standard 9 pin 'Buccaneer' connector (see **Figure 2-2**, 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.

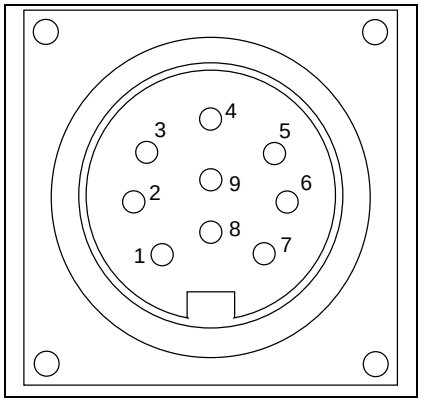


Figure 2-2 Buccaneer Bulkhead Connector (front view)

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 2nd detector O/P)

Table 3: Output Cable (with isolated 2nd 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 (PCB 1)

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 (PCB 1) – Digital Processor							
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
SW 1,2: **Detector Height** **0, 0** = Height #1 – 5m **0, 1** = Height #2 – 6m **1, 0** = Height #3 – 7m **1, 1** = Height #1		**SW 3:** Not Used	**SW 4:** Not Used	**SW 5:** Not Used	**SW 6:** Not Used	**SW 7:** **DFM** **0** =Default monitor time (20hours inactive) **1** = 'fault monitor time' is set by the Engineer's Terminal	**SW 8:** **Remote Configuration** **0** = Disabled **1** = Enabled

Key:

0	OFF
1	ON
*	Unidirectional detection
**	Bidirectional detection

Note: The switches provided on PCB 2 (Special Serial Interface card) control the operation of the Siemens Serial Interface (SiTOS), details of the switch settings for this PCB are shown in the table below (***Section 2.3***).

2.3 DIP Switch Settings (PCB 2) – SiTOS only

The SiTOS facility utilises the industry standard RS485, two wire serial communication technique. This allows a number of detectors to be attached to a common pair of lines thus giving the ability to interrogate the detectors individually. It is therefore necessary to assign a unique address to each detector on the common pair using the dual-in-line switch located on the Special Serial Interface card (see the table below for the PCB switch settings).

DIP Switch Number (PCB 2) – Special Serial Interface (SiTOS)							
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
SW 1: **Line Termination** **0** = Disabled **1** = Enabled	**SW 2,3:** **Not Used**		**SW 4 to 8:** **(SW 4 = MSB, SW 8 = LSB)** **Detector Address:** **0, 0, 0, 0, 0** = Address 0 (00h) **0, 0, 0, 0, 1** = Address 1 (01h) **……** **1, 1, 1, 1, 1** = Address 31 (1Fh)				

2.4 Detector mounting methods

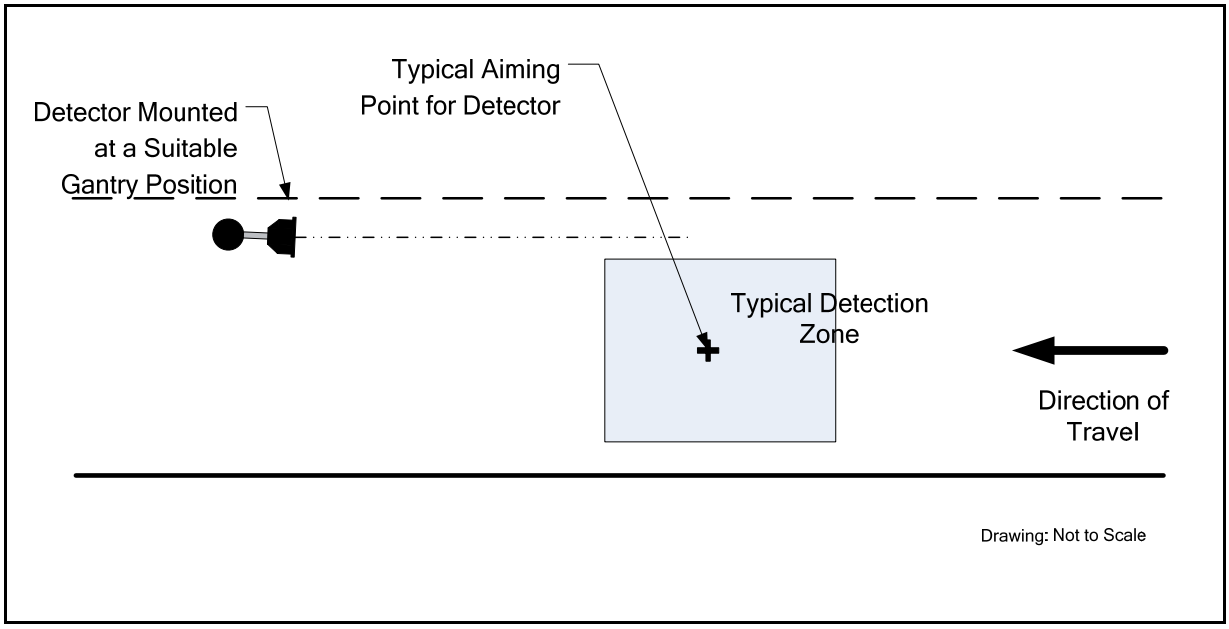
This detector is typically mounted on a gantry. When mounting make sure that it is positioned such that it provides good coverage of the lane being assessed. Do ensure that it is mounted at an angle of 45^{o} to the road surface for optimum speed and traffic classification accuracy.

2.5 Detector alignment

Detector Alignment

When aligning the detector always ensure the following:

1. The detector is mounted at an angle of 45^{o} to the road surface. This angle will provide optimum speed and traffic classification accuracy.
2. The detector is mounted at a suitable location on a gantry ensuring good coverage of the lane being assessed.
3. The detector is 'aimed' at a position as shown in the diagram below.



Installation 'Quick Reference' Guide

Electrical Connections

Important Notes:

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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.**

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.
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
1	Detector Supply (24V AC/DC)	Red
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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 2nd 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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Detector Mounting Methods

This detector is typically mounted on a gantry. When mounting make sure that it is positioned such that it provides good coverage of the lane being assessed. Do ensure that it is mounted at an angle of 45° to the road surface for optimum speed and traffic classification accuracy.

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When aligning the detector always ensure the following:

1. The detector is mounted at an angle of 45° to the road surface. This angle will provide optimum speed and traffic classification accuracy.
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