Heimdall Radar Pedestrian Detector

On Crossing Detector Installation Guide

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

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1	07/06/2010	Initial Release
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3	23/09/2011	Updated Part numbers
4	08/09/2014	Updated Images for Clarity
5	13/08/2015	Updated 'Quick Reference' Guide in appendix

This document is electronically held.

Contents

1 General

This document refers to the On Crossing Pedestrian version of the Heimdall series of Detectors which 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.
Please check that the layout of the site is compatible by referring to the 'Heimdall General Handbook' (667/HB/31900/000)

1.1 Part number

Part Number	Description
667/1/31900/05x	On Crossing 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
Note: Options 1 – 4 are non standard, please refer to Siemens Poole for further ordering information.

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.
6. Inline Installation Assistance Cable (667/1/31912/000) (Optional)

1.3 Performance Details

Operating Range: 4m to 12m.
Crossing Width: 2.4m to 4m.
Crossing Length: Detection system can be adjusted to accommodate crossing lengths between 4m to 12m.
Detector Locations: A typical system will comprise two Heimdall detectors located on opposite sides of the crossing.
Detection Presence Time: Not applicable.
Detector Mounting Height: 3.3m to 4.0m.
Accuracy: Not applicable.
LED Orientation: Facing forwards

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

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.**

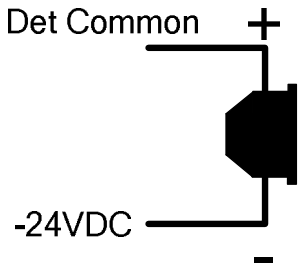


Figure 2-1 Connection of Heimdall detector to Siemens ELV controller

2.1.1 9-Pin 'Buccaneer' connector

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

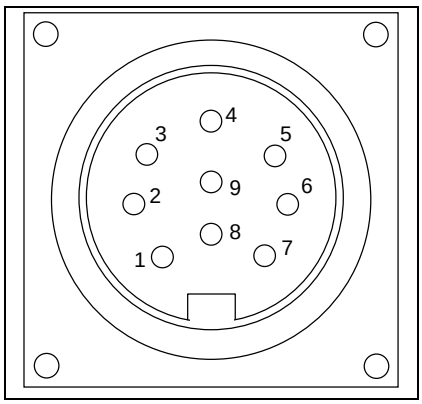


Figure 2-2 *Buccaneer Bulkhead Connector (front view)*

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 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

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
Detection Direction 0,0 = Detects pedestrians moving in both directions (default) 0,1 = Detects pedestrians moving away from unit only 1,0 = Detects pedestrians moving towards unit only 1,1 = As per 0,0		Detector LED 0,0 = Normal Detector O/P 0,1 = Permanently Off 1,0 = Detector O/P for 20 minutes after power applied 1,1 = Normal Detector O/P		Detector Hold Time 0 = 600mS 1 = 2000mS	Detection Sensitivity 0 = Normal 1 = High	DFM 0 = Default monitor time (20 hours inactivity) 1 = 'fault monitor time' is set by the Engineer's Terminal	Remote Configuration 0 = Disabled 1 = Enabled

Key:

0	OFF
1	ON

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

The detector must be mounted where the whole crossing can be “seen” with no brackets, cables or other street furniture masking it.

The detector should normally (first choice) be located on the offside primary signal pole (ref. Figure 2-5). Alternatively the detector may be fitted on other poles if circumstances dictate. The following factors may influence position:

- Line of sight obstructions such as trees etc.
- Road layout permits better aim from offside pole.
- Cabling requirements.

If the detector is installed alongside a Heimdall kerbside detector using the Heimdall Kerbside Detector Bracket (667/1/31910/000), it is recommended to use the Heimdall Kerbside Extension bracket (667/1/31911/000) to move the on crossing detector to a better position as shown in Figure 2-5

There are several mounting positions available on the standard Kerbside Mounting Bracket for the Kerbside Extension Bracket. **Two bolts must be used to secure the two together in all instances.**

If there is no Kerbside detector (Kerbside Mounting Bracket) fitted to the signal pole, or if circumstances dictate, the On Crossing detector should be mounted on a standard Signal Head bracket.

Figure 2-3 Heimdall Kerbside Mounting Bracket (667/1/31910/000)

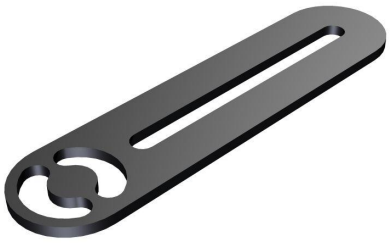


Figure 2-4 Heimdall Kerbside Extension Bracket (667/1/31911)

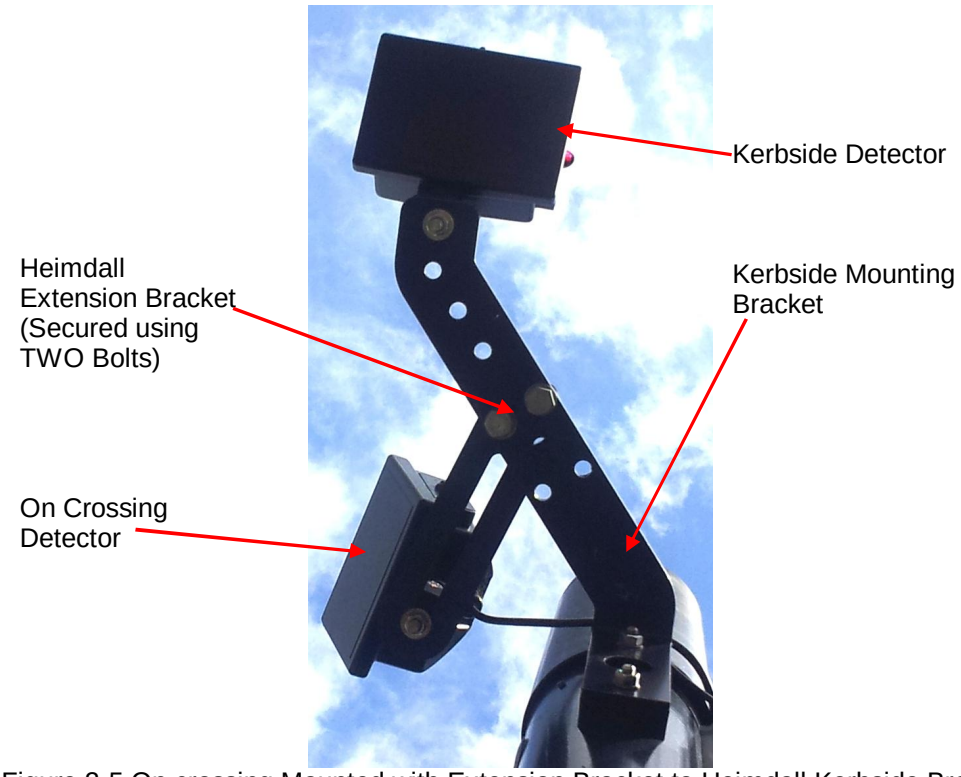


Figure 2-5 On crossing Mounted with Extension Bracket to Heimdall Kerbside Bracket

Detector alignment

The detector uses a movement detection algorithm. Thus, the detector is aimed towards oncoming pedestrians, at the right of the centre line of the on crossing area and towards the far side of the carriageway.

As a starting point the mounting angle may be pre-set to:

- 25 degrees from vertical for a 12 m crossing

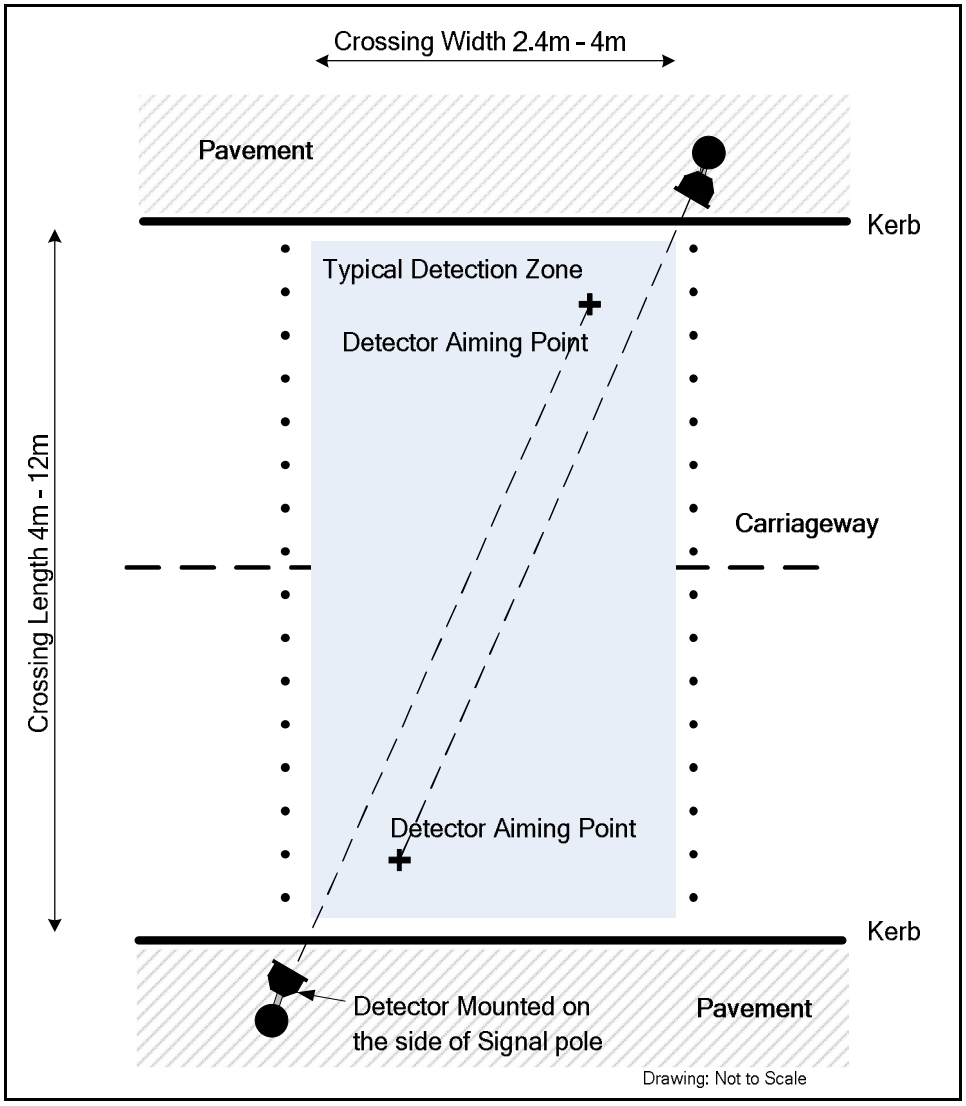


Figure 2-6 Detector Aiming

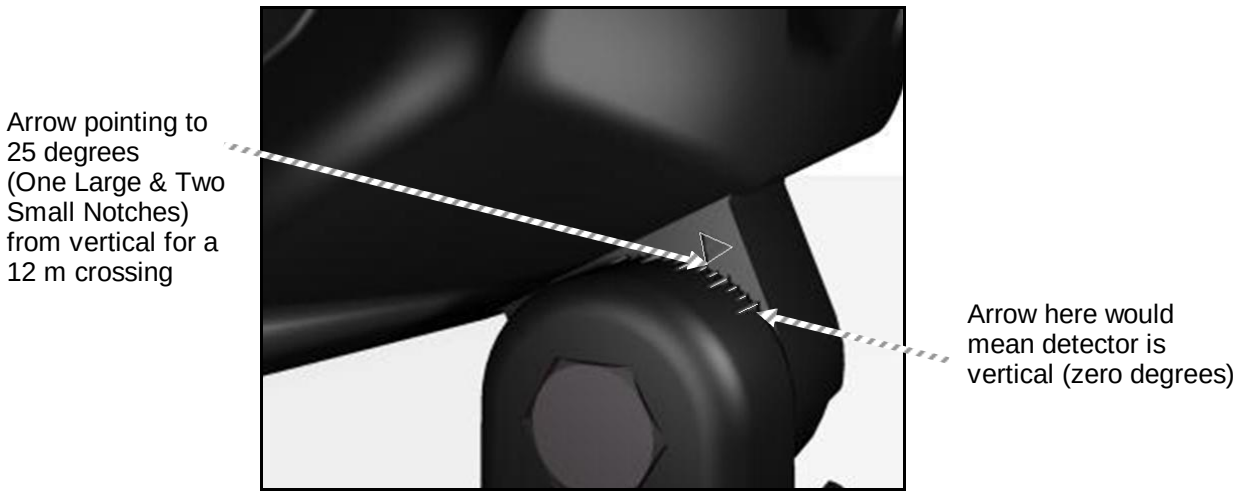


Figure 2-7 Heimdall set to 25 degrees from Vertical

2.4 Zone Testing

Once the detector has been installed the crossing coverage must be tested, this is done by walking towards the detector.

For ease of use when testing with only one person the 'Inline Installation Assistance Cable' (667/1/31912/000), can be used to allow the detect LED to be more visible.

1. From a standing position several feet back from the kerb, walk along each dotted white line either side of the crossing towards the detector.
2. The detector should start to detect as you step off of the kerb until you get near to the opposite side in both cases. If this is not the case re-align detector and start perform step 1 again.
3. Again from a standing point several feet back from the kerb, walk the centre of the crossing towards the detector.
4. The detector will probably pick you up before you leave the kerb, this is perfectly normal, and should detect almost all the way across.
5. Repeat these steps for the opposite detector to ensure the whole crossing is covered.

Heimdall Installation 'Quick Reference' Guide for an On Crossing Detector

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 and pedestrian 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.**

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
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).

For pinout and wiring details of the output cable for either the SiTOS or 2nd output detector options, please refer to the 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. The initial calibration of the kerbside detector is carried out using the Dip Switches. 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 (Led window should face forward)
The switches on the first PCB (Digital Processor) control the basic functions of this detector and are as listed in the following table:

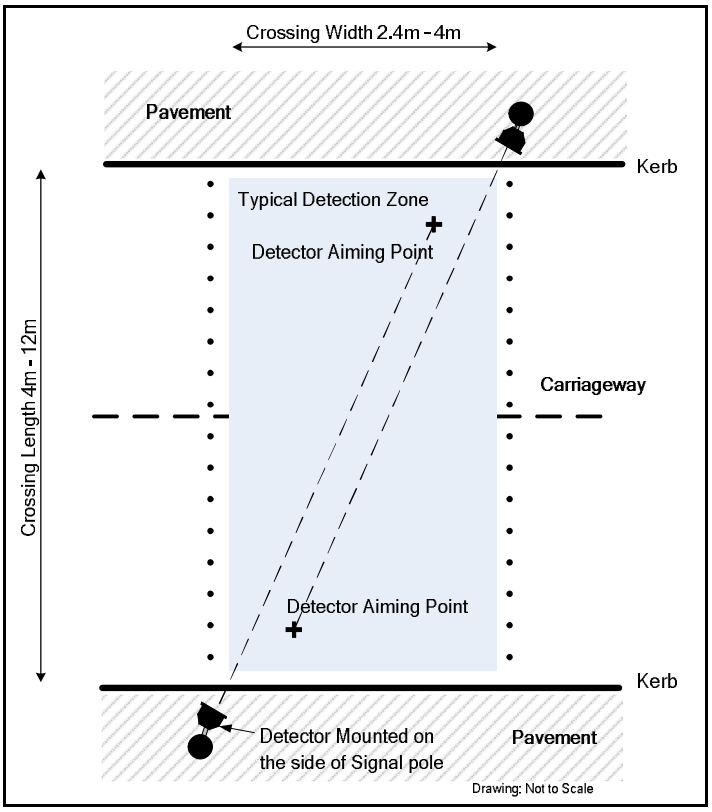
Note: Default settings are with all DIP switches set to '0'/ OFF.

DIP Switch Number							
1	2	3	4	5	6	7	8
Detection Direction 0,0 = Detects pedestrians moving in both directions (default) 0,1 = Detects pedestrians moving away from unit only 1,0 = Detects pedestrians moving towards unit only 1,1 = As per 0,0		Detector LED 0,0 = Normal Detector O/P 0,1 = Permanently Off 1,0 = Detector O/P for 20 minutes after power applied 1,1 = Normal Detector O/P		Detector Hold Time 0 = 600mS 1 = 2000mS	Detection Sensitivity 0 = Normal 1 = High	DFM 0 = Default monitor time (20 hours inactivity) 1 = 'fault monitor time' is set by the Engineer's Terminal	Remote Configuration 0 = Disabled 1 = Enabled

Key:

0	OFF
1	ON

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 installation guide.



Detector Mounting

The detector must be mounted where the whole crossing can be "seen" by the detector with no brackets, cables or other street furniture masking it.

The detector uses a movement detection algorithm. Thus, the detector is aimed towards oncoming pedestrians, at the right of the centre line of the on crossing area and towards the far side of the carriageway.

As a starting point the mounting angle may be pre-set to:

- 25 degrees (One Large & Two Small Notches) from horizontal for a 12 m crossing

Arrow here would mean detector is vertical (zero degrees)

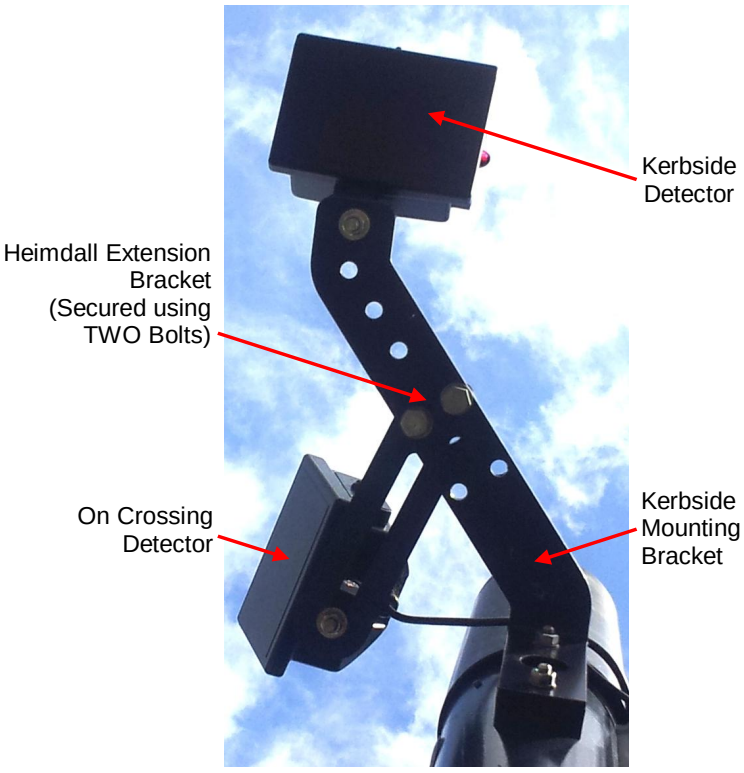
Zone Testing

Once the detector has been installed the crossing coverage must be tested, this is done by walking towards the detector.

For ease of use when testing with only one person the 'Inline Installation Assistance Cable' (667/1/31912/000), can be used to allow the detect LED to be more visible.

1. From a standing position several feet back from the kerb, walk along each dotted white line either side of the crossing towards the detector.
2. The detector should start to detect as you step off of the kerb until you get near to the opposite side in both cases. If this is not the case re-align detector and start perform step 1 again.
3. Again from a standing point several feet back from the kerb, walk the centre of the crossing towards the detector.
4. The detector will probably pick you up before you leave the kerb, this is perfectly normal, and should detect almost all the way across.
5. Repeat these steps for the opposite detector to ensure the whole crossing is covered.

Note: In cases where the alignment and calibration is not returning expected results please refer to the Heimdall Detector General Handbook (667/HB/31900/000) or the On Crossing Detector Installation Guide (667/HB/31900/350)



On crossing Mounted with Extension Bracket to Heimdall Kerbside Bracket