SLD4

Loop Detector Application Notes

Feb-20

Issue 3

667/HQ/45200/101

Contents

Contents 2

List of Figures 4

List of Tables 5

Health and Safety Protection 6

Handling Precautions 7

1. Introduction 8

1.1. Purpose 8

1.2. Document References 8

1.3. Key Terms and Abbreviations 8

2. General Setup 9

2.1. SLD4 Loop Inductance Link Settings 9

2.2. SLD4 Sensitivity 10

3. Bus Detection 11

3.1. Loop Type for Bus Applications 11

3.2. Basic Setup of Detector 11

3.3. Advanced Configuration Setting 12

3.3.1. Bus Detection Threshold Setting Process 12

3.4. Additional Options 15

4. Tram Detection Applications 16

4.1. Tram Detection Applications 16

4.2. Basic Setup of Detector 16

4.3. Advanced Tram Configuration Setting 16

4.3.1. Gapping 16

4.3.2. Sticking On 17

5. Rail Crossing Applications 18

This section is concerned with vehicle approaches to rail crossings. 18

5.1. Rail Crossing Applications 18

5.2. Basic Setup of Detector 18

5.3. Advanced Rail Crossing Configuration Settings 18

5.4. Confirmation of Performance 21

5.5. Putting the loop detector into operation 22

6. Bicycle Detection 23

6.1. Loop Type for Bicycle Detection Applications 23
6.2. Basic Setup of detector 24
6.3. Advanced Bicycle Configuration Setting 24
7. Classification Setup 25
7.1. Basic Classification Settings 25
7.2. General Vehicle Classification Configuration 25
7.3. Single Loop and Double Loop 26
7.3.1. Mapped Classification 27
8. Parking Bay Applications 33
8.1. Parking Bay Monitoring (typically used for EV Chargers) 33
8.2. Presence Time (bay occupation time) 33
8.3. Adjacent Bay Detection 33
9. Troubleshooting 34
9.1. Refreshing SLD4 Configurator Setup 34
9.2. Serial Cable connection (702/4/08535/000) 34

List of Figures

Figure 1: Links for sensitivity (two per loop) 9
Figure 2 : Reading the SLD4 Configuration 12
Figure 3 : Setting Configuration 13
Figure 4 : Setting Loop Mode 14
Figure 5 : Evaluating Loop Settings Using data Capture 15
Figure 6 : Reading the estimated inductance values 19
Figure 7 : Vehicle Records (German language settings) 20
Figure 8 : Vehicle Profile 20
Figure 9 : Loop Sensitivity Settings (%DL/L and [Hz] are site dependent) 21
Figure 10 : New Vehicle Profile with New Threshold 21
Figure 11 : Disconnecting the Serial COM Interface 22
Figure 12 : Example Loop Dimensions for Bicycle Detection 23
Figure 13 : General Vehicle Loop Configuration 25
Figure 14 : Loop Frequency 26
Figure 15 : Loop Status 26
Figure 16 : Location of Classification Settings 27
Figure 17 : Classification Mode Selection (General Tab) 27
Figure 18 : Classification Bin Configuration 28
Figure 19 : Example 1 Classification bin configuration 29
Figure 20 : Digital output configuration Example 1 Mapping 30
Figure 21 : Example 2 Classification bin configuration 31
Figure 22 : Digital output configuration for Example 2 32
Figure 23 : Presence Time (s) Settings 33
Figure 24 : SLD4 Configuration Tool – Creating a New Configuration 34

List of Tables

Table 1 : External Document References	8
Table 2 : Terms and Abbreviations	8
Table 3 : Link and Switch Function	10
Table 4 : Inductance Jumper Settings for Detection	10
Table 5 : Suggested Bus Detection Settings	12

Health and Safety Protection

Installation and Maintenance Personnel

In the interests of health and safety; when installing, using or servicing this equipment the following instructions must be noted and adhered to:

1 Only skilled or instructed personnel, with relevant technical knowledge and experience, who are also familiar with the safety procedures required when dealing with modern electrical/electronic equipment, are to be allowed to use and/or work on this equipment. All work shall be performed in accordance with the local regulations[1,2].

2 Such personnel must take heed of all relevant notes, cautions and warnings in this Handbook and any other Document or Handbook associated with the equipment including, but not restricted to, the following:

i. The equipment must be correctly connected to the specified incoming power supply.

ii. Only trained / competent persons should work on this equipment.

iii. Any power tools must be regularly inspected and tested.

iv. Any personnel working on site must wear the appropriate protective clothing, e.g. reflective vests, etc.

Road Users

It is important that all personnel are aware of the dangers to road users that could arise during repair and maintenance of traffic control equipment.

Ensure that the junction area is coned and signed as necessary to warn motorists and pedestrians of any dangers and to help protect the personnel working on the site.

[1] For UK this refers to Electricity at Work Regulations 1989.
[2] For DE this refers to GV A3, DIN EN 50110-1 (VDE 0105-1) and VDE 0832 and the work-safety leaflet ASM 0099-01

Handling Precautions

Handling

1. Take care when handling these modules as they can be easily damaged.
2. Always observe anti-static precautions.

Damage through electric fields or electrostatic discharge

Electric fields or electrostatic discharge can cause malfunctions through damaged individual components, integrated circuits, modules or devices.

3. Only pack, store, transport electronic components, modules or devices in their original packaging or in other suitable materials, e.g. conductive foam or anti-static bags.

4. Ensure that the user is discharged prior to handling any modules. This can be achieved by touching an earthed surface such as a control cabinet, for example.

1. Introduction

1.1. Purpose

These application notes provide additional guidance, to that provided in the SLD4 User Manual (667/HB/45200/000), for a range of specific applications such as bike, bus and tram detection.

1.2. Document References

External Document References	
667/HB/45200/000	SLD4 User Manual
667/HE/20663/000	Loop detector and cable terminations installation and commissioning handbook (UK)
667/HE/20664/000	Installation and Testing (General)
667/HE/31699/000	Loop Inductance Calculator
667/HQ/45200/000	SLD4 Users Quick Start Guide
667/HQ/45200/001	SLD4 Intelligent Detector Backplane Quick Start Guide
667/TZ/45216/000	SLD4 configuration tool software

Table 1 : External Document References

1.3. Key Terms and Abbreviations

	Key Terms and Abbreviations
BMS	Business Management System (Siemens Electronic Document Storage Tool for Process Documents)
DIP	Dual In-Line Package
LED	Light Emitting Diode
MOL	Mobility
N/A	Not Applicable
NC	No Connection
PCB	Printed Circuit Board
ITS	Intelligent Transportation Systems (Mobility)

Table 2 : Terms and Abbreviations

2. General Setup

In most cases, the use of the 'Configuration Tool' is necessary in order to get the optimum settings of the SLD4 for these application types.

To communicate with the SLD4 then the following items will be required:

5. Laptop PC or LRT Netbook
6. PC based "SLD4 configuration Tool" 667/TZ/45216/000
7. USB cable interface 702/4/08535/000

AC Supplies

When using 24 AC supply to the detector, only use battery powered interface equipment (e.g. laptop, PDA). Do not connect mains powered/connected interface equipment to the SLD4. Failure to observe these precautions may damage the detector and/or the connected device

2.1. SLD4 Loop Inductance Link Settings

The links for loop sensitivity are shown below (PL3, PL4, PL5, PL6):-

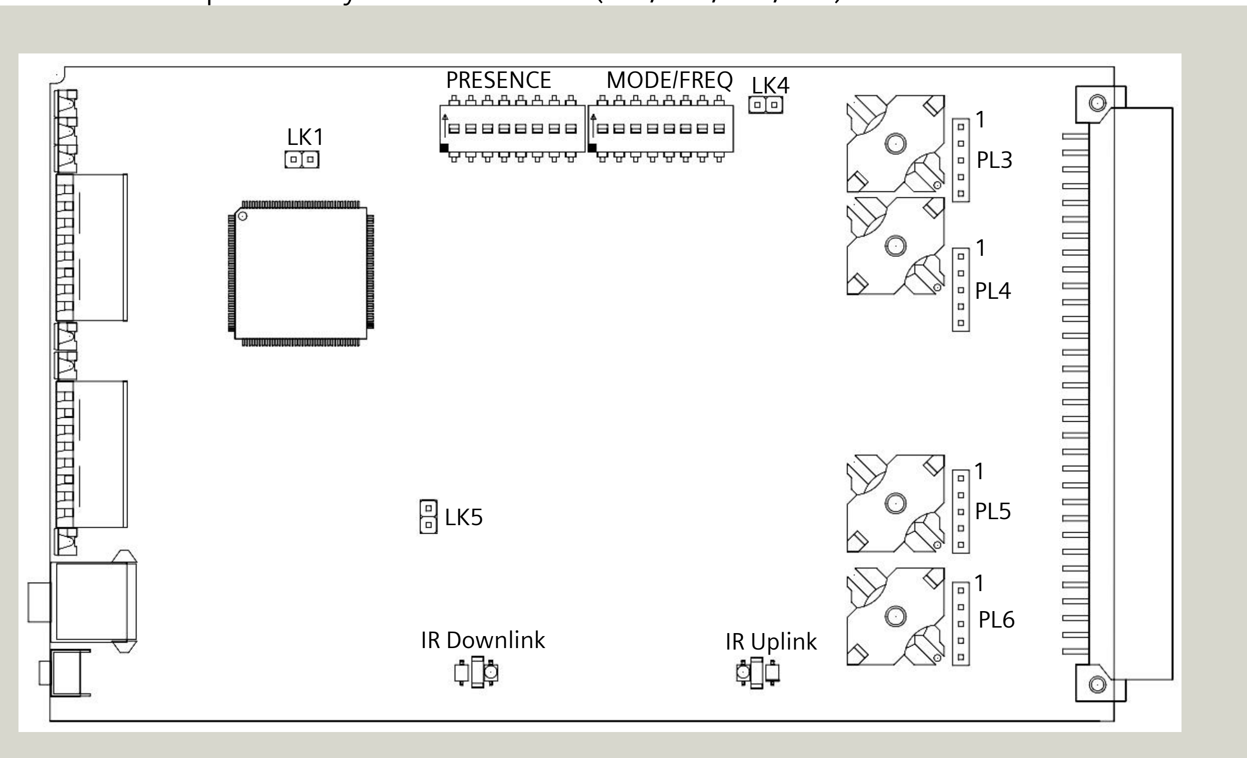

Figure 1: Links for sensitivity (two per loop)

Link Function	
Link	**Function**
PL3	Loop 1 inductance setup links
PL4	Loop 2 inductance setup links
PL5	Loop 3 inductance setup links
PL6	Loop 4 inductance setup links

Table 3 : Link and Switch Function

Sensitivity Settings		
Range	**Jumper Setting**	**Inductance Range**
1	1-2, 3-4	20-150uH
2	2-3, 4-5	150uH-300uH
3	1-2 ,4-5	260uH-2000uH

Table 4 : Inductance Jumper Settings for Detection

Note

In practice inductance ranges overlap so it is possible to use a lower range in some circumstances. This may give better performance, particularly for bicycle detection.

2.2. SLD4 Sensitivity

The detector threshold may either be set in “Hz” or as a percentage of loop inductance change (**$\%\Delta L/L$**). Which you use only depends upon which is most convenient for the application. In general, it is recommended that “Hz” mode is used for large vehicles (tram, bus), as this provides easier value adjustment for large vehicles. The value is a whole number in the thousands range, for an inductance change it would be a two decimal place number.

The “Hz” setting is slightly dependent upon frequency, so if you change the loop frequency then the sensitivity in “Hz” may need to be changed higher or lower in proportion to the loop frequency change. This is the disadvantage of using the “Hz” setting mode.

Detector Variant Differences

The standard SLD4 detector supports only “Bicycle” mode whereas the remaining modes requires an enhanced SLD4 detector.

3. Bus Detection

3.1. Loop Type for Bus Applications

Note

This application note is to be read in conjunction with the SLD4 User Manual (667/HB/45200/000).

When using the SLD4 advanced detector the following points **must** be considered as they have big influence on the performance of the detector:

- The Quality of loop and feeder installation. For example the loops must be cut and installed into stable Tarmac or Concrete.
- When cutting the loops, chamber lids, expansion joints and rebar should be avoided since they distort the loops field and can make the loop insensitive or inconsistent.

This detector can be used in locations where traditional Classification might otherwise be difficult such as areas where vehicles are slowing e.g. braking zones or in queuing traffic.

Note

The suggested default loop for bus detection is 10M by 3M with 2 turns.

Larger loops can be used if detection is to be limited to larger buses.

Note

When using large loops, smaller vehicles such as cars/vans do not occupy sufficient area of the loop at any one time and the majority of the length of these types of vehicle has a much larger ground clearance. Therefore they will not cause a large enough deviation in the inductance and have a smaller frequency change. This allows the threshold of the loop to be set above the detection range of these types of vehicles.

3.2. Basic Setup of Detector

The inductance range needs to be set for the appropriate loop channel, 1 to 4, being used for the Bus detectors. The recommended bus loops have a higher inductance than smaller loops, so links PL3 to PL6 must be set to 2-3 and 4-5, this is the medium inductance range.

These ranges are for guidance only, and for short feeders it may be possible to use the range below that recommended and achieve greater performance.

3.3. Advanced Configuration Setting

The following are suggested settings applicable for detecting buses with the SLD4 Loop Detector;

Suggested Bus Detection Settings		
Setting	**Value**	**Comment**
Switch Config	Disable	This will allow for specific thresholds to be set.
Loop Mode	Hz	

Table 5 : Suggested Bus Detection Settings

3.3.1. Bus Detection Threshold Setting Process

1 Click on the Read button to load the current detector configuration into the tool for editing. See Figure 1below.

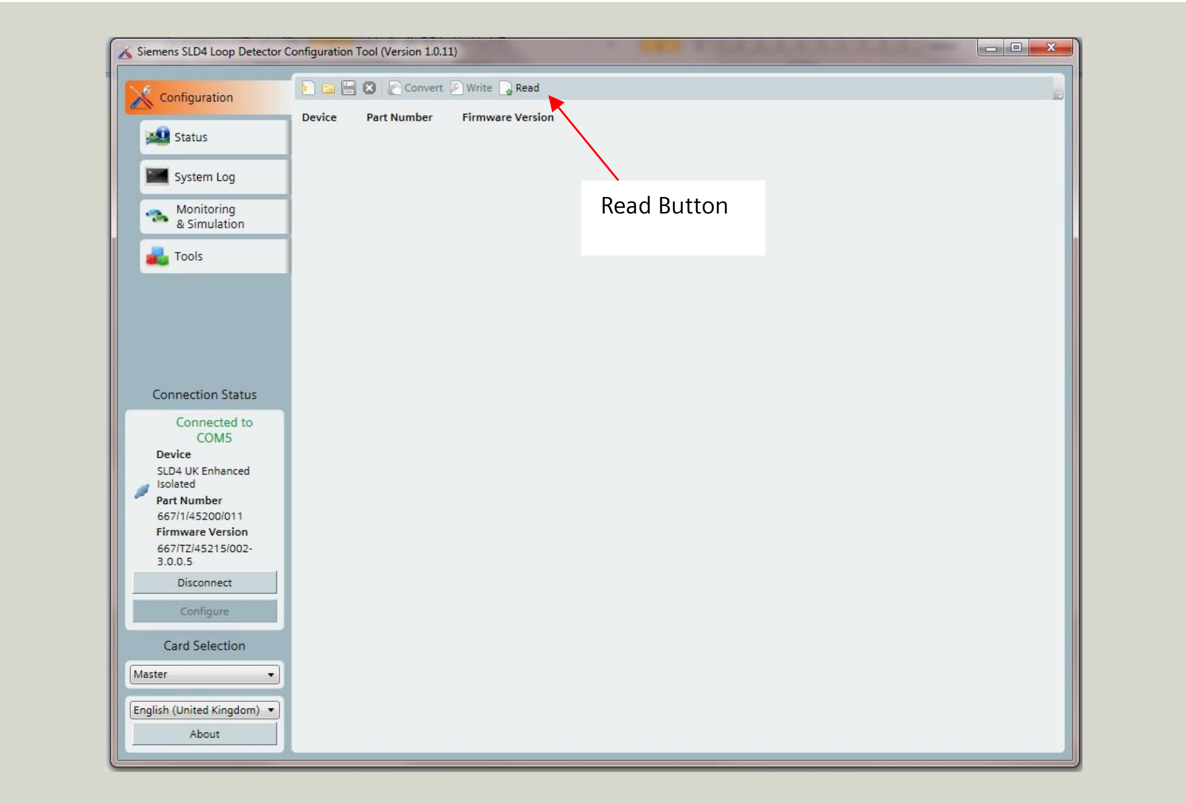

Figure 2 : Reading the SLD4 Configuration

2 Set the “Switch Config” to Disable.

3 On the Loop tab (Loop1 to 4) of the loop to be configured set the ”Loop Mode” to Hz. See Figure 4 : Setting Loop Mode

---

Note

The “Loop sensitivity Hz (Hz)” should be left at the default (20) until the loop sensitivity has been assessed using the Monitoring and simulation page, details of which are shown in Figure 5 . See also 2.2 SLD4 Sensitivity for explanation of “Hz” versus %d/D settings.

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4 The other tabs in this application can be left to their default settings

5 Once these changes are made the Write Button should be clicked

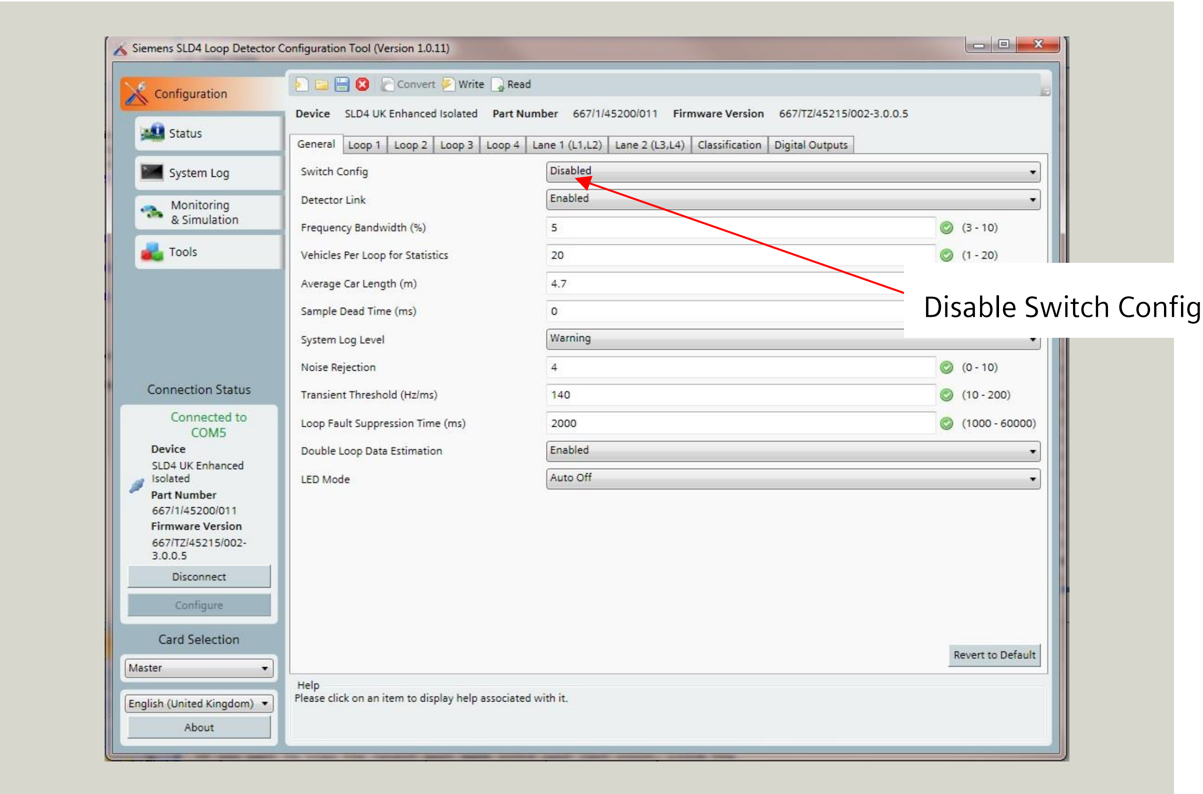


Figure 3 : Setting Configuration

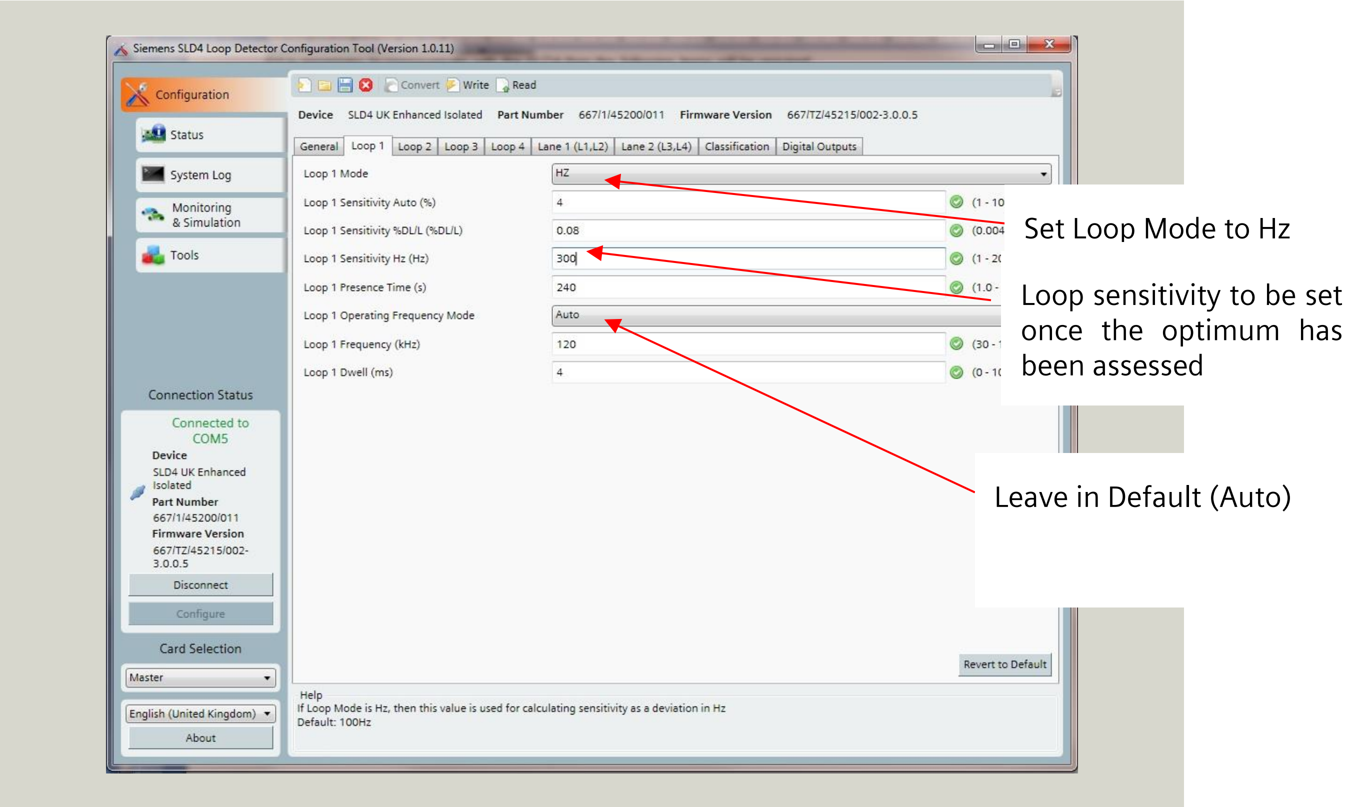


Figure 4 : Setting Loop Mode

6 Click on Monitoring and Simulation tab to assess the required sensitivity.

7 Click on Capture vehicles button to start the real-time vehicle data capture. The tool will capture vehicles in real time. You need to check the maximum deviation in frequency for the target vehicles.

8 Once you have completed the Vehicle Capture click on the End Capture Button. You can now save this data for future reference if required by clicking on the Disc icon.

9 Click on the Configuration tab. The profiles will vary but it is important, to set the sensitivity such that all target vehicles are captured. You will find that other vehicles (Cars, Vans etc) will have a lower deviation should be set to a sensitivity value, 20% less than the deviation for the target vehicles. In the example shown below, the sensitivity will be set to 1200Hz and then the Write Button clicked, set up is now complete but can be adjusted at any time by using the Configurator tool. A threshold of 1200Hz falls mid-way between the deviations for buses and for cars/vans (typically 400Hz).

Note

The “Loop sensitivity Hz (Hz)” should be left at the default (20) until the loop sensitivity has been assessed using the Monitoring and simulation page, details of which are shown in Figure 5

Note (9) Typical values assume there is no Rebar, Buried metal or Slag waste present, which will alter the frequency variations mentioned above (especially in the North East of the UK.

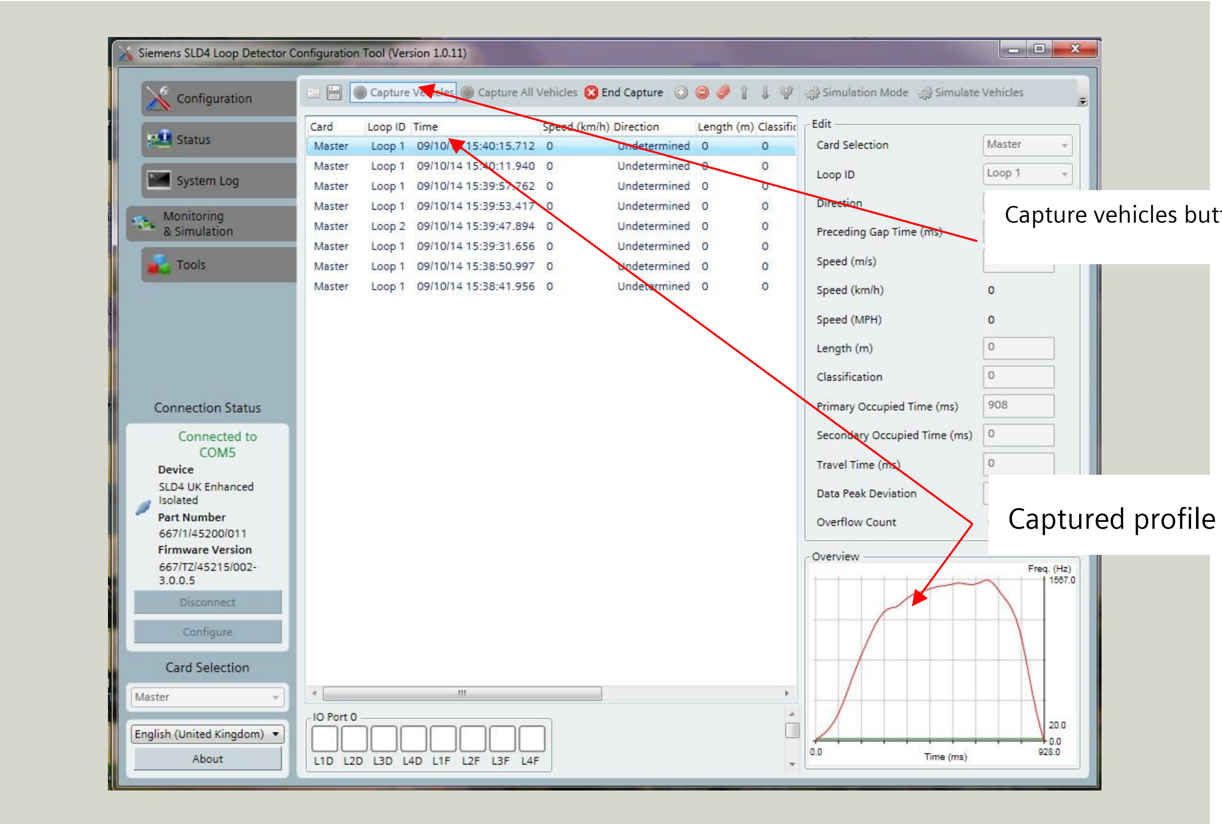


Figure 5 : Evaluating Loop Settings Using data Capture

3.4. Additional Options

It is possible to connect the single bus loop into two detector channels and configure the sensitivity separately so that one channel will detect only busses while the other channel will detect all vehicles. This provides a low cost method of vehicle detection with bus discrimination from a single loop.

4. Tram Detection Applications

This section is concerned with the detection of stationary and moving trams and this section deals with the special issues presented due to the similarity of the tram with multi-vehicles.

4.1. Tram Detection Applications

There are two main functions that the loop can provide in tram detection applications;

8. Stationary presence of a tram – used in tram stops etc
9. Moving presence of a tram - used for holding off junctions or signs

4.2. Basic Setup of Detector

The inductance range needs to be set for the appropriate loop channel, 1 to 4, being used for the tram detectors. Typically the tram loops are very similar to standard traffic loops and so the inductance most probably needs to be set to the lowest level. Links PL3 to PL6 must be set to 1-2 and 3-4, this selects the low inductance range of the detector.

4.3. Advanced Tram Configuration Setting

If you experience difficulties with configuring the SLD4 with the tool, then refer to section 9 “ Troubleshooting” or the General Handbook (667/HB/45200/000) for further guidance.

4.3.1. Gapping

When the SLD4 is set to default settings there may be some detection issues. Gapping occurs when the detector loses the detection of the tram while the tram is still stationary or statically over the loop.

To resolve this, lower the threshold of the detector, thus increasing the sensitivity in increments of 2% at a time until the gapping issue is resolved. This is achieved by using the “HZ Loop Mode” configuration.

The detector may continue to gap when the sensitivity cannot be increased, if this occurs then the gap period needs to be covered by the output extension[3] which is found in the digital output mapping of the SLD4 configuration tool (bottom of screen). This should be configured as appropriate to remove the gapping. A suitable starting point is for an 800mS output extension.

[3] The use of ‘Minimum Vehicle Gap’ has no effect on the detection output but may be useful for accurate count statistics.

Note

When interpreting the performance of the detector, there are key points that should be considered:

10. Only consider the relay output of the detector when interpreting the performance, for example via the controller.
11. The LEDs on the front of the SLD4 detector are an indication, however the output extension configuration does not influence the LEDs on the front panel.
12. The vehicle overview on the SLD4 Configuration Tool (Monitoring & Simulation) displays a filtered version of the raw signal from the detector. This is appropriate for normal vehicle traffic, but not for trams

4.3.2. Sticking On

Sticking on, also be referred to as “flickering”, occurs when the detector continues to show a detection after the tram has left the detection area. This can sometimes be caused by vehicles in adjacent lanes.

To resolve this, increase the threshold, thus decreasing the sensitivity in increments of 0.02 %DL/L at a time until the sticking on issue is resolved.

There is a trade-off between “sticking on” and “gapping” which may prove difficult to resolve with setting changes alone. In this very rare case, it may be necessary to move the loop away from the adjacent lane.

5. Rail Crossing Applications

This section is concerned with vehicle approaches to rail crossings.

5.1. Rail Crossing Applications

The requirements for the use of SLD4 loop detectors at railway crossings may differ from the normal use of vehicle detection within traffic control systems.

Example scenario:

13. Only cars are to be detected, i.e. no cyclists or motorcyclists.
14. Long term stationary vehicles must be continuously detected. The Presence time is configured to prevent loop re-tuning.
15. Gaps between individual vehicles may last for a number of hours. No spontaneous occupancies (false positives) should occur, as these could interfere with the rail traffic
16. In the event of faults, it is possible that the customer may wish to replace a module without a software tool or support from Siemens, using their own maintenance service. Plug and play operation must be possible.

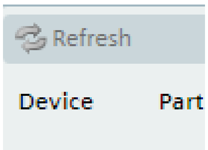
5.2. Basic Setup of Detector

The loop detector card is setup with factory settings and connected to the relevant loop(s).

It is necessary to disable any channels without loops by setting the DIP switch on the front panel to the "0" position. Green POWER LED flashes slowly.

5.3. Advanced Rail Crossing Configuration Settings

1. In the Status menu of the SLD4 Configurator software, update the display:



2. Read the values and read out and record the values for the inductance and background noise for each connected loop.

   NOTE: Displayed inductance value accurate only when PL3 (1-2) and PL6 (3-4) set.

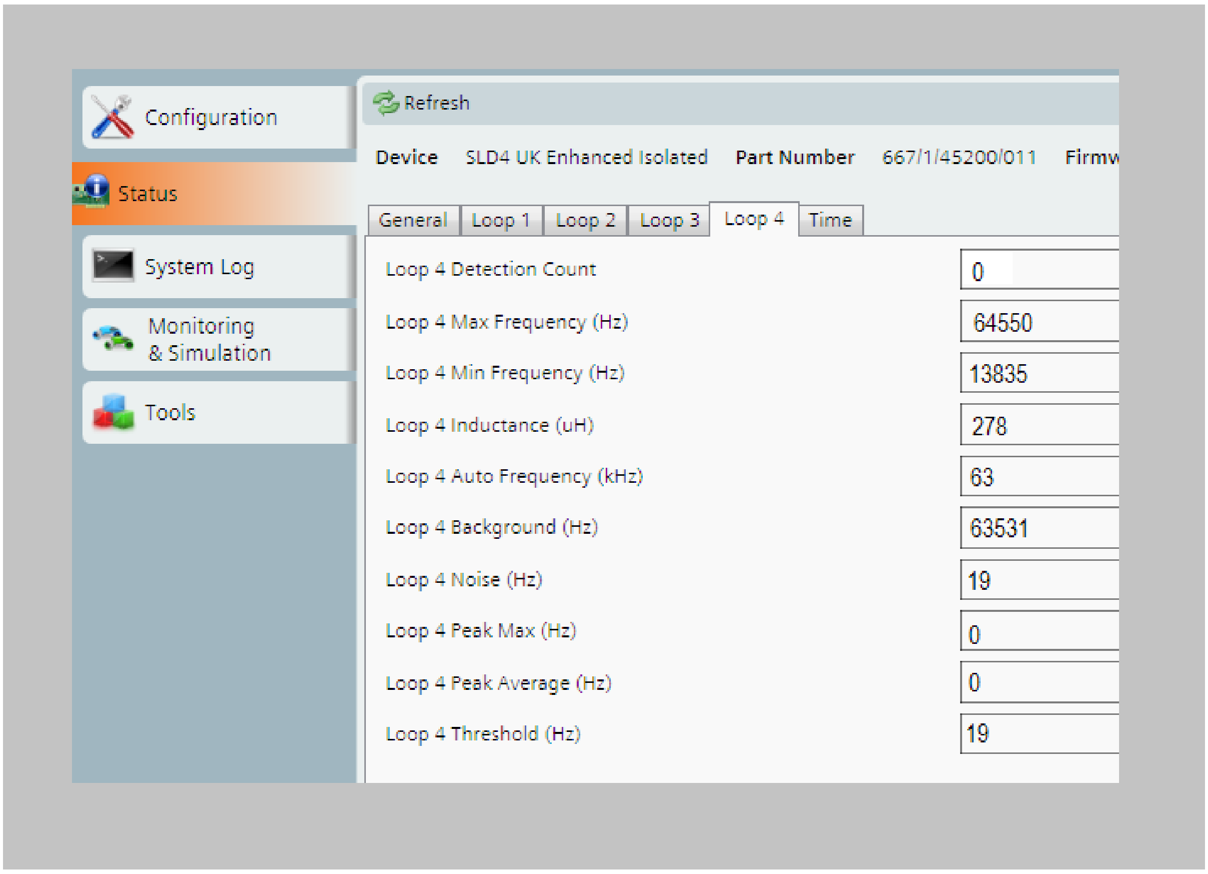


Figure 6 : Reading the estimated inductance values

3. For each loop, insert the jumper on the loop detector so that they correspond to the inductance value of the loop.

   Refer to section 0 (
4. SLD4 Loop Inductance Link Settings)

5. In the Monitoring & Simulation menu in the SLD4 Configurator software, click on the "Record All Vehicles" tab

6. Drive over each loop in question, at least five times. Each pass should result in a vehicle record, which includes a vehicle profile. The respective loop indicator LED should turn red when there is a car present on the loop.

Baugruppe	Schleifen	Modus	Zeit	Geschwindigkeit (km/h)	Richtung	Länge (m)	Klasse	Vorausgehende Zeitlücke (ms)	Primäre Belegung
Master	Schleife 4		11/11/16 09:12:30.608	0	Unbestimmt	0	0	1133	418
Master	Schleife 4		11/11/16 09:12:29.057	0	Unbestimmt	0	0	1002	451
Master	Schleife 4		11/11/16 09:12:27.558	0	Unbestimmt	0	0	13483	467
Master	Schleife 4		11/11/16 09:11:15.951	0	Unbestimmt	0	0	830	412
Master	Schleife 4		11/11/16 09:11:14.682	0	Unbestimmt	0	0	1074	482
Master	Schleife 4		11/11/16 09:11:13.087	0	Unbestimmt	0	0	6947	501
Master	Schleife 4		11/11/16 09:08:39.755	0	Unbestimmt	0	0	1370	426
Master	Schleife 4		11/11/16 09:08:37.872	0	Unbestimmt	0	0	1214	515
Master	Schleife 4		11/11/16 09:08:36.229	0	Unbestimmt	0	0	130361	429

Figure 7 : Vehicle Records (German language settings)

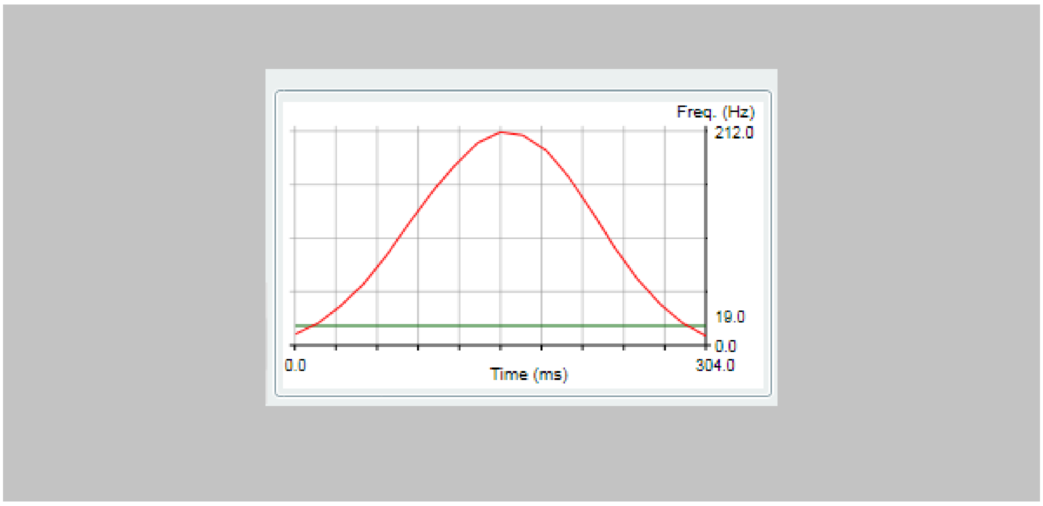


Figure 8 : Vehicle Profile

7. Note the frequency value of the trigger threshold in AUTO Sensitivity Mode. In Figure 8 the value would be 19Hz.

8. Use the following table, which shows what sensitivity in %DL/L of the trigger threshold is set based on captured results.

S4	S3	S2	S1	%DL/L	[Hz]
0	0	0	0	OFF	OFF
0	0	0	1	0.01	2
0	0	1	0	0.02	5
0	0	1	1	0.04	11
0	1	0	0	0.08	23
0	1	0	1	0.1	28
0	1	1	0	0.25	72
0	1	1	1	0.5	144
1	0	0	0	1.0	289
1	x	x	x	N/A*	N/A*
1	1	1	1	AUTO	AUTO

Figure 9 : Loop Sensitivity Settings (%DL/L and [Hz] are site dependent)

9. For each loop in question, set the fixed value for the sensitivity using the DIP switch on the front panel in accordance with the frequency values recorded above. Select the higher value in borderline cases. In the example, the threshold value recorded was 19Hz so the user should select elect 23 Hz from the table in Figure 9

Note

The threshold value selected should not be smaller than the values recorded for background noise.

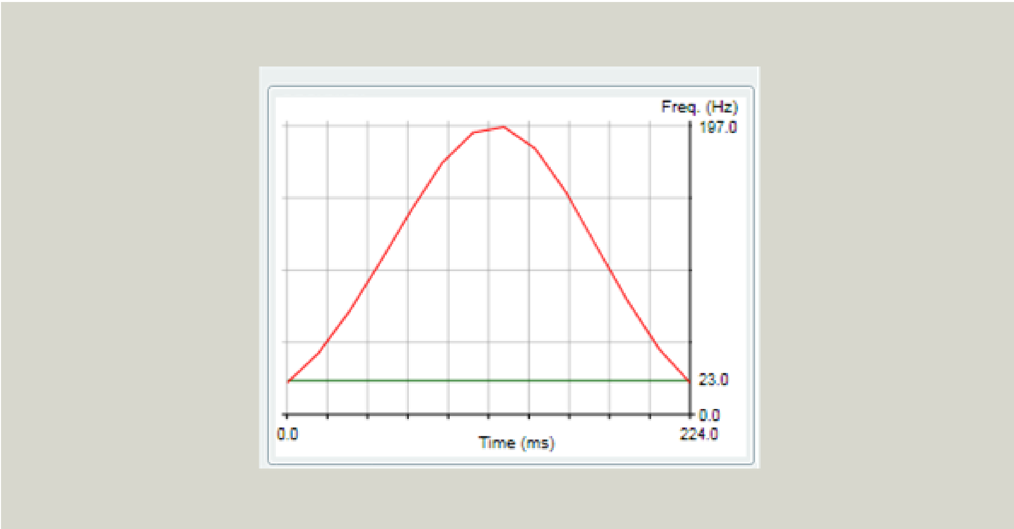


Figure 10 : New Vehicle Profile with New Threshold

10. The MODE LED double flashes / flashes as the same speed as the POWER LED

11. Push the reset button for approximately 3 seconds until the POWER LED is permanently illuminated

5.4. Confirmation of Performance

Drive over each loop in a car at least two times and record the signals.

Test Confirmation Criteria:

- If required, adjust the sensitivity from the table and drive over the loop again. Then record the selected value
- The loop must remain occupied when there is a car continuously present on the loop.
- The loop may not become spontaneously occupied (false positive) without a road vehicle being present.
- It may be considered reasonable that the loop ‘detects’ whilst a train is passing, however the loop should not detect once the train has passed.

The user may choose to save the information and vehicle profiles for future reference.

1. In the Monitoring & Simulation menu in the SLD4 Configurator software, click on the Recording Ended ("Aufnahme beendet") tab.

2. Save the recording, which creates the (.veh file).
   File name structure: Kunde_BUeNr_IBN_SLD4_Datum.veh
   Example: SBB_BUe94_IBN_SLD4_20161201.veh

5.5. Putting the loop detector into operation

1. Screw the module in tightly

2. Disconnect the connection to the module using the software

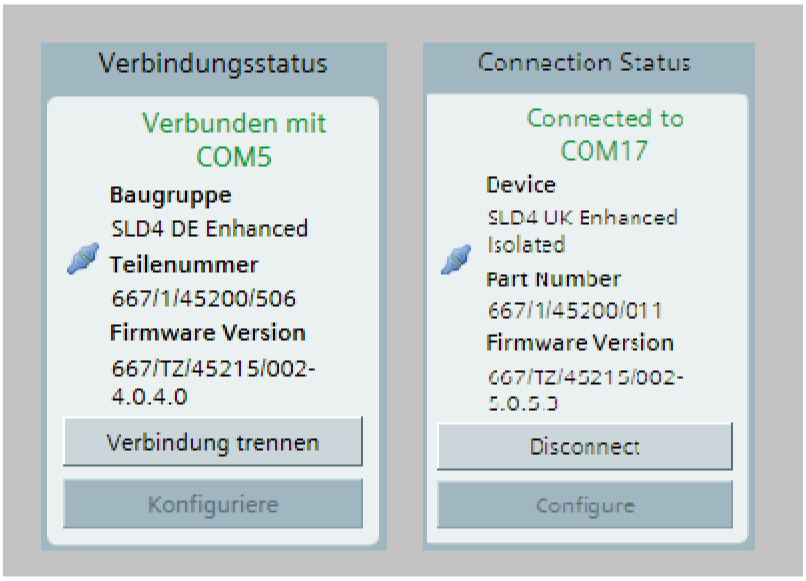


Figure 11 : Disconnecting the Serial COM Interface

6. Bicycle Detection

Accurate Bicycle Detection

For accurate bicycle detection the following settings are recommended;

1. Use manual loop sensitivity setting (Hz mode)
2. Ideally use an appropriate loop geometry

6.1. Loop Type for Bicycle Detection Applications

The chevron loop is normally recommended for bicycle detection. A normal vehicle loop does not provide the ideal sensitivity for a bicycle.

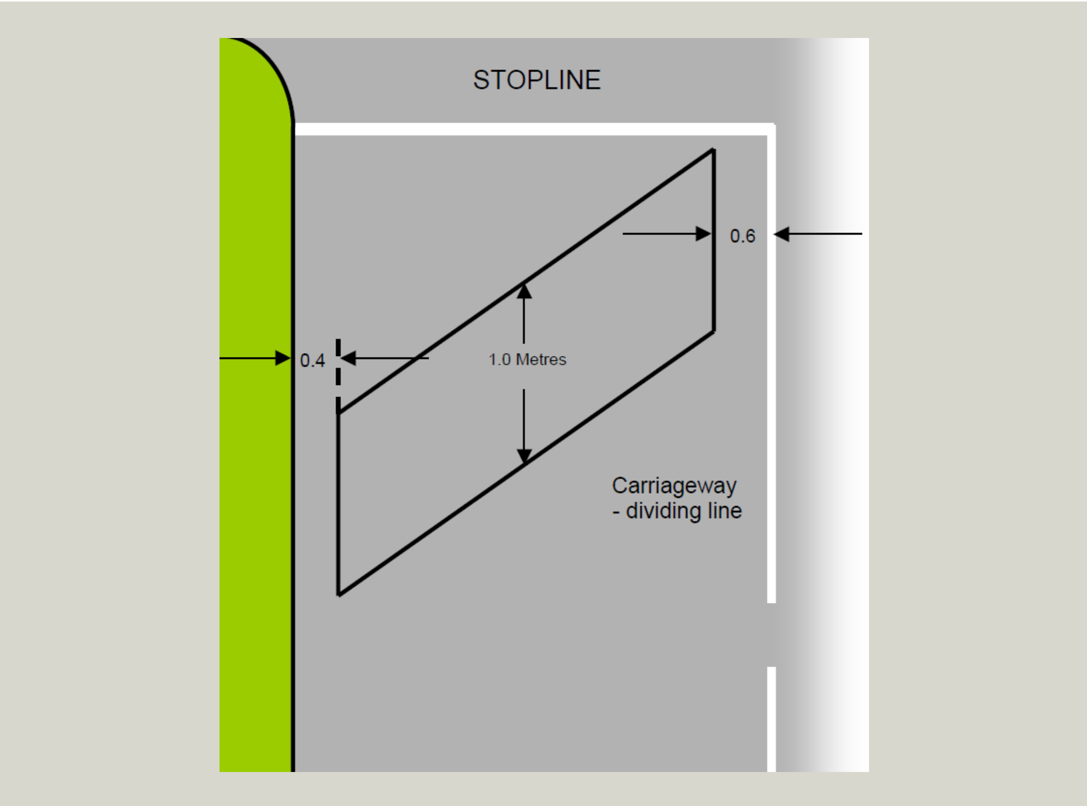


Figure 12 : Example Loop Dimensions for Bicycle Detection

Carbon Fibre Bicycles

The SLD4 detector does not have good detection performance with bicycles predominantly manufactured from carbon fibre.

Feeder Length for Bicycle Detection

It is recommended that feeder lengths less than 300m are used for bicycle detection applications.

6.2. Basic Setup of detector

The inductance range needs to be set for the appropriate loop channel, 1 to 4, being used for the bicycle detection. Typically the loops are very similar to standard traffic loops and so the inductance most probably needs to be set to the lowest level. Links PL3 to PL6 must be set to 1-2 and 3-4, as this is the low inductance range.

Refer to 2.1 SLD4 Loop Inductance Configuration for information.

6.3. Advanced Bicycle Configuration Setting

If you experience difficulties with configuring the SLD4 with the tool, then refer to section 1 "

Troubleshooting"

Set the SLD4 to "(%DL/L" in the "Loop Mode" configuration and lower the threshold of the detector, thus increasing the sensitivity in increments of **0.02** (%DL/L loop mode) at a time until the detection of bicycles is consistently made.

7. Classification Setup

7.1. Basic Classification Settings

The SLD4 supports multiple classification options which are fully described in the SLD4 Handbook 667/HB/45200/000 section 2.4.5.

7.2. General Vehicle Classification Configuration

For vehicle classification the loops should be configured as follows in the manual %DL/L mode with an initial sensitivity of 0.08. This configuration should work well for most sites.

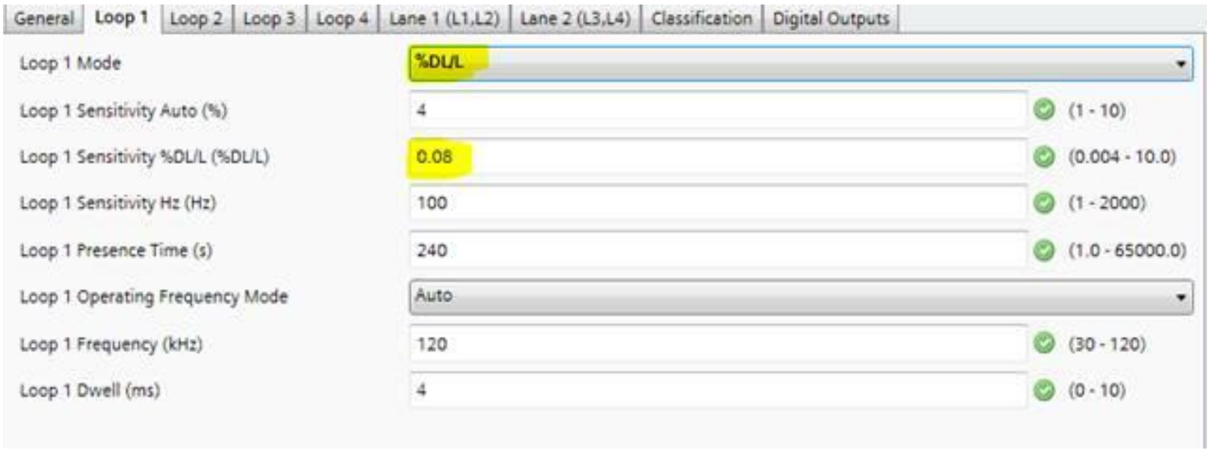


Figure 13 : General Vehicle Loop Configuration

If required, the user can then monitor the SLD4 detections on the 'Monitoring and Simulation' tab to determine the consistency of the vehicle classifications. If phantom detections are observed, the sensitivity should be increased incrementally in 0.01%DL/L steps. A sensitivity of 0.12 should ensure no phantom detections occur but could decrease the motorbike detection accuracy.

The user should also check that each SLD4 card is operating on a unique loop frequency (Loops 1 to 4 on each card can share the same frequency, but loops on separate cards should not have the same loop frequency). Assuming the SLD4 cards are linked together by the backplane the 'Auto' loop operating frequency mode will ensure unique frequencies, but if this is not the case the loop frequencies should be set up manually.

To check the loop frequencies select on the 'Status' tab, click 'refresh' and check that the 'Background (Hz)' value is unique for each card (i.e. different kHz range).

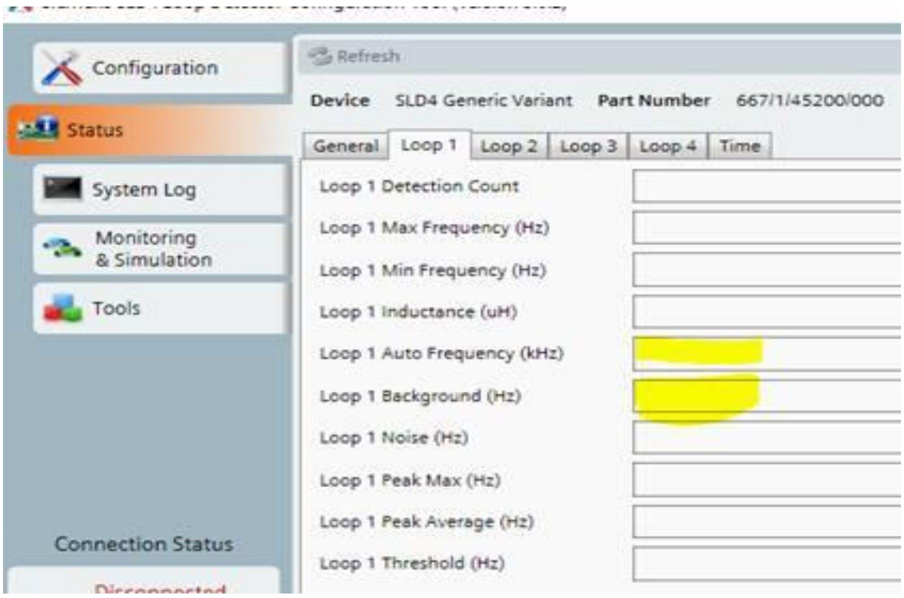


Figure 14 : Loop Frequency

To ensure normal operation the user should check that there are no loop faults or other unexpected SLD4 faults (status codes). After clicking refresh a few times the status codes display should be blank.

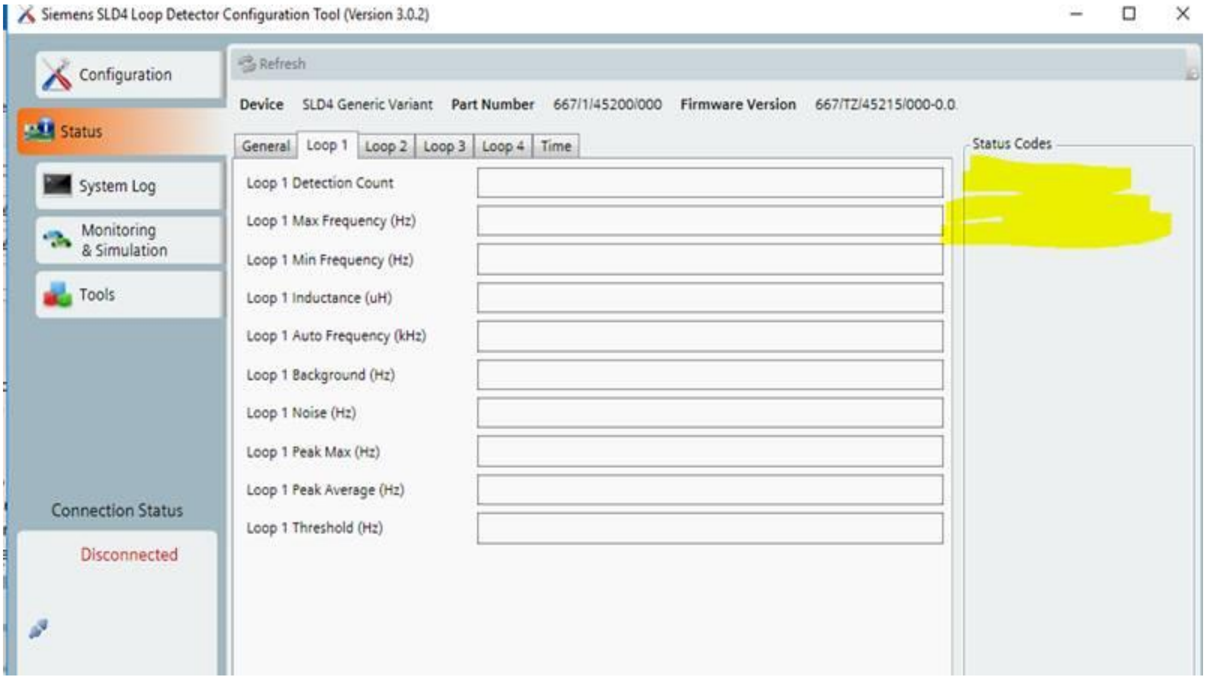


Figure 15 : Loop Status

7.3. Single Loop and Double Loop

There are extensive options available which allow classification in both single loop and double (paired) loop modes. Double loop classification supports multiple vehicle classes, typically single loop classification can only distinguish between a couple of vehicle classes (e.g. large vehicles and small vehicles.

A limitation of the detector is that only two sets of class definitions can be made, these are applied to loop1 and 2, and loop 3 and 4. In single loop mode it is only possible to define two classification definitions.

When configured for single loop classification the class definitions for lane 1 apply to loop1 and loop2, and lane 2 to loop3 and loop4.

The available classification options allow the vehicle speed and length to be used as criteria for defining a vehicle class. A vehicle meeting a class definition causes an internal class detect event which may be assigned to physical output as required. The class detect and vehicle detect events can be individually assigned to the physical outputs and GSPI.

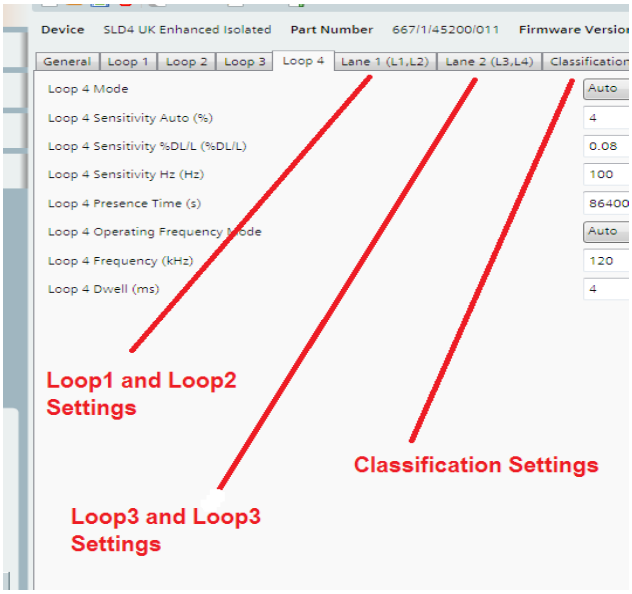


Figure 16 : Location of Classification Settings

7.3.1. Mapped Classification

The mapped classification (classification bins) config tab, as shown in Figure 18 allows up to 9 classification bins (also referred to as class) to be mapped. The 'Mapped' setting shown Figure 17 must be selected to use this feature. Each bin has a Class ID which can be used to customise the classification value reported in the vehicle data.

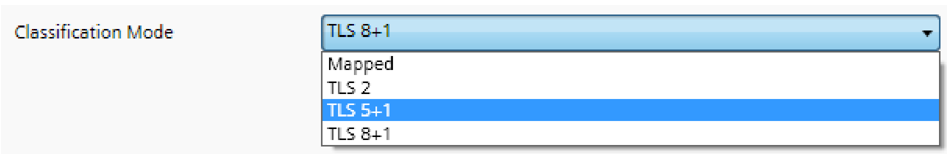


Figure 17 : Classification Mode Selection (General Tab)

The classification bins can be configured in terms of min/max length and speed, and vehicle profile class (TLS vehicle classes), or a combination of both. The bins can be mapped to the digital outputs, as shown in, it is possible to map several classification bins to a single output if required. It is also possible to configure classification bins which overlap, if a vehicle meets the criteria of more than one bin, the classification value becomes the binary bitwise combination of the class ID's (reference handbook 667/HB/45200/000 for details).

The mapped classification feature provides great flexibility in creating vehicle classes, but this feature is quite complex. The two examples below, sections 7.3.1.1 and 7.3.1.2, illustrate how this feature can be used. Contact Siemens support if additional help is required in setting up complex classification mappings

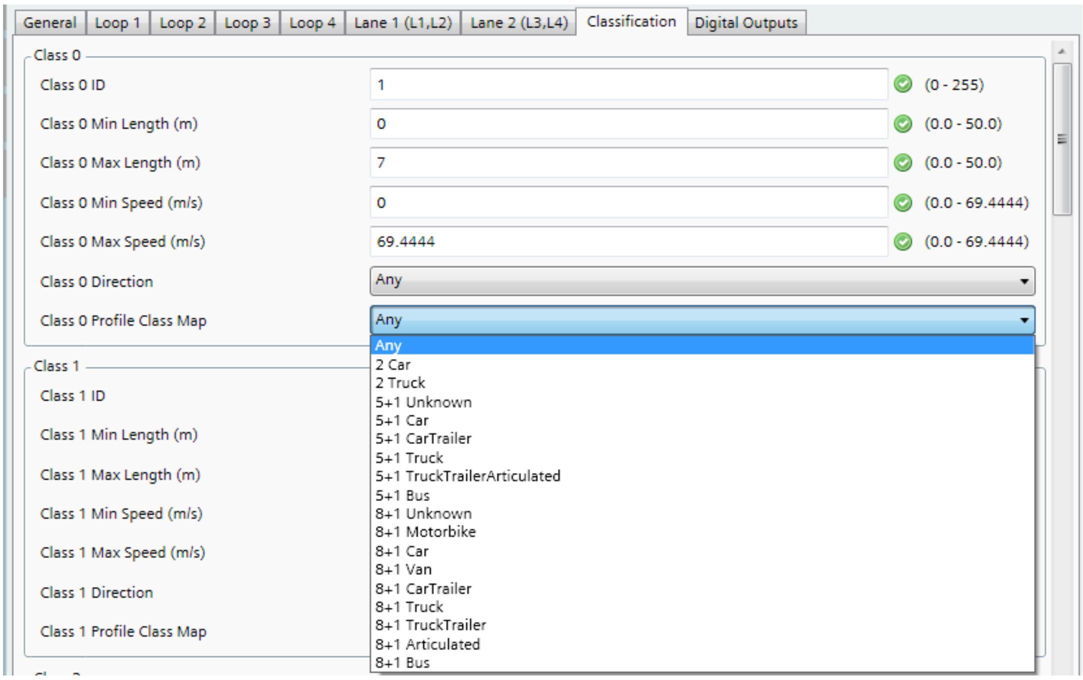


Figure 18 : Classification Bin Configuration

7.3.1.1. Classification Example 1 – Mapping Bus and Large Truck classes to digital outputs

Example Requirement – Lane 1 Bus detection mapped to Digital output 1, Lane 1 Large Truck detection (Truck Trailer and Articulated) mapped to Digital output 2.

As shown in Figure 19, the first two classification bins (Class 0, Class 1 and Class 3) only filter on the selected profile class, length and speed min/max set to the extremes to ensure the vehicle speed and length will not affect the classification.

In this example Classification bins 3-7 are not used and left as the default settings – min and max speed/length set to 0, to ensure no vehicle could meet the class criteria.

Classification bin 8 acts as the Unknown class and left as the default setting. Any vehicle not classified as within class 0,1 or 2 will be classified as class 8 (unknown class ID value of 0).

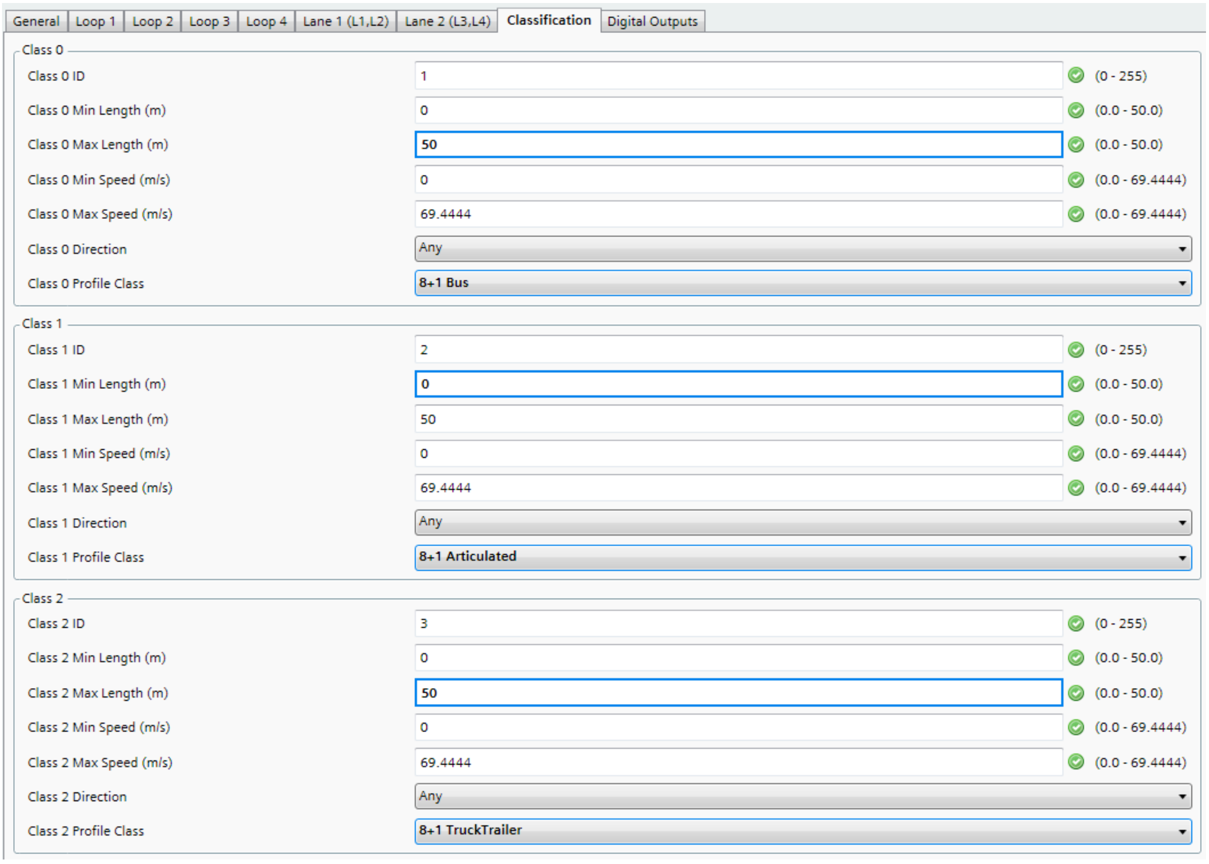


Figure 19 : Example 1 Classification bin configuration

Note

The additional length/speed settings allow for further customisation on top of the loop profile classification. For example, Class 1 could be configured for 8+1 Articulated <15m, and Class 2 8+1 Articulated >15m

		D0	D1
Channel 1	Detect	☐	☐
	Fault	☐	☐
Channel 2	Detect	☐	☐
	Fault	☐	☐
Channel 3	Detect	☐	☐
	Fault	☐	☐
Channel 4	Detect	☐	☐
	Fault	☐	☐
Lane 1	Class 0	☑	☐
	Class 1	☐	☑
	Class 2	☐	☑
	Class 3	☐	☐
	Class 4	☐	☐
	Class 5	☐	☐
	Class 6	☐	☐
	Class 7	☐	☐
	Class 8	☐	☐

Figure 20 : Digital output configuration Example 1 Mapping

7.3.1.2. Classification Example 2 – Mapping Speeding vehicles to digital outputs

Requirement – Detection on digital output 1 for small vehicle speed >70mph on lane 1, detection on digital output 2 for Truck or Bus speed >60mph on lane 1

As shown in Classification bins (Class 0,1 and 2) filter on the selected profile class and vehicle speed, length min/max set to the extremes to ensure the vehicle length will not affect the classification.

60mph = 26.8m/s, 70mph = 31.3m/s

Class 0 set to profile class 5+1 Car, to include motorbike and van.

Class 3 (not shown in figure below) set to profile class 5+1 TruckTrailerArticulated, min speed 26.8m/s

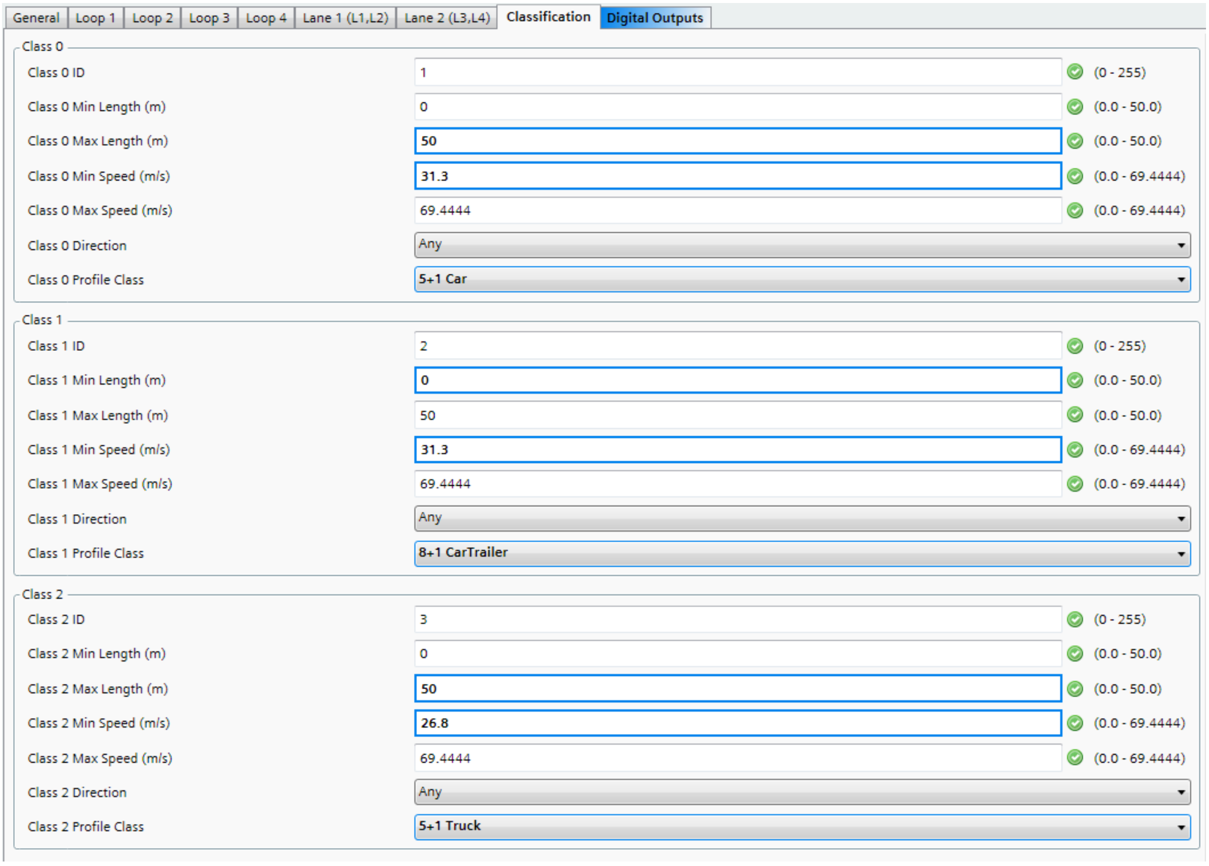


Figure 21 : Example 2 Classification bin configuration

Note

If the classification bins overlap, change the 'Class ID' to a discrete binary bit integer values to ensure the overlapped classification value makes sense. An example of what this means is; with the following config, a Car with 4.6m length will be given classification value of 3 (binary 0011), and a Car with length 4.9m will be given classification value of 6 (binary 0110);

Class 0, ID=1 (binary 0001), min len=0m, max len =4.8m, Profile class=5+1 Car

Class 1, ID=2 (binary 0010), min len=4.5m, max len =5m, Profile class=5+1 Car

Class 2, ID=4 (binary 0100), min len=4.8m, max len =5.5m, Profile class=5+1 Car

These alternative mapped classification values are included in the GSPI serial interface/messages, but not the SiTOS interface (reference SLD Handbook for information).

		D0	D1
Channel 1	Detect	☐	☐
	Fault	☐	☐
Channel 2	Detect	☐	☐
	Fault	☐	☐
Channel 3	Detect	☐	☐
	Fault	☐	☐
Channel 4	Detect	☐	☐
	Fault	☐	☐
Lane 1	Class 0	☑	☐
	Class 1	☑	☐
	Class 2	☐	☑
	Class 3	☐	☑
	Class 4	☐	☐
	Class 5	☐	☐
	Class 6	☐	☐
	Class 7	☐	☐
	Class 8	☐	☐

Figure 22 : Digital output configuration for Example 2

8. Parking Bay Applications

8.1. Parking Bay Monitoring (typically used for EV Chargers)

The purpose of parking bay monitoring is to ensure that the bays are not used for normal parking and are only used for charging vehicles. A central system monitors parking bay occupancy and will inform the car park operator of any vehicles over-staying the normal vehicle charging period.

8.2. Presence Time (bay occupation time)

For Parking Bay Monitoring, it is generally necessary to adjust the presence time to maximum. This allows the bay to be detected as occupied during the 45 minute charge time.

It is normal and desirable for permanent detect to occur when the parking bay is occupied. In order to prevent detection of adjacent vehicles, it may be necessary to reduce the sensitivity of the loop. The “presence” time is therefore set to maximum and sensitivity reduced.

The presence time is set to maximum as shown below (24 Hrs = 86400.0 seconds):

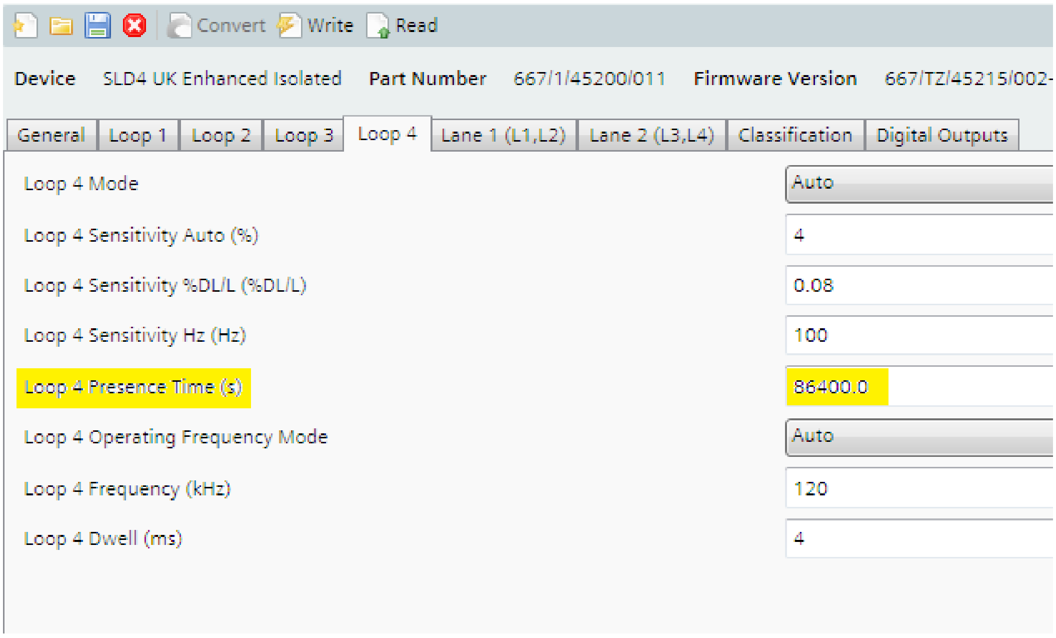


Figure 23 : Presence Time (s) Settings

8.3. Adjacent Bay Detection

It is generally advisable to manually set the sensitivity to ensure vehicles in adjacent bays are not detected. There is generally insufficient traffic flow to allow automatic settings to be use successfully.

If adjacent vehicles are still detected at minimum sensitivity, then changing the loop frequency may be necessary to remove these false detects.

9. Troubleshooting

This section provides some information on issues you may experience when using the configuration tool.

9.1. Refreshing SLD4 Configurator Setup

Firstly, remove all but the generic configurations within the SLD4 Configuration Tool. This can be completed by creating a new configuration; connecting to a detector and then deleting the various configurations, as shown in Figure 24 : SLD4 Configuration Tool – Creating a New Configuration.

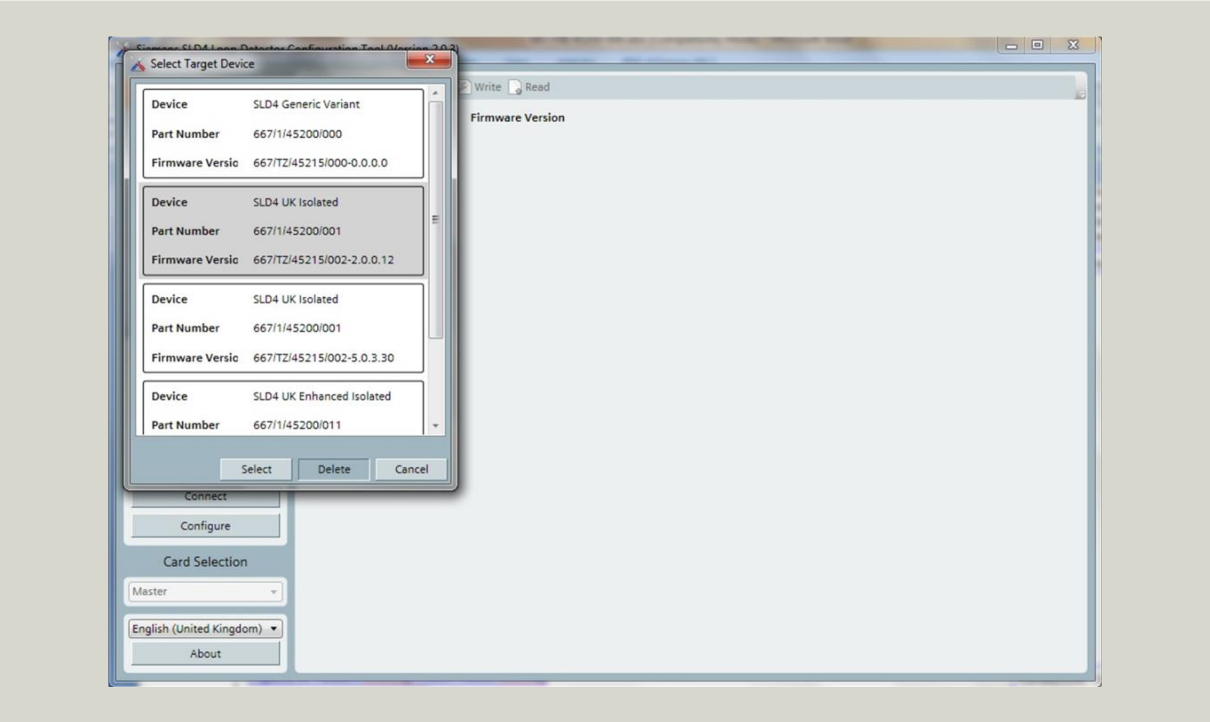


Figure 24 : SLD4 Configuration Tool – Creating a New Configuration

Following this step, reset the configuration of the detector to its default settings by selecting the 'Revert to Default' button in the bottom right hand corner of the SLD4 configuration tool.

This will ensure the SLD4 Configurator uses the latest available configuration settings for the detector you are configuring.

Once the current configurations are removed, connecting to an SLD4 will allow the upload of the current schema from the detector. This is then available in the configuration tool.

9.2. Serial Cable connection (702/4/08535/000)

Connection to the SLD4 is via the front panel 3.5mm socket and a USB to 3.5mm serial cable. The communications port and settings are set through the "Configure" button on the left hand side of the SLD4 Configurator display. The COM port for the cable will not be displayed until it is plugged into the laptop. The logic levels are compatible with 3.3V logic levels.

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