

Siemens Traffic Controls
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667/HB/27663/000

HANDBOOK

ST4S/ST4R Loop Detector

THIS DOCUMENT IS ELECTRONICALLY HELD AND APPROVED

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FUNCTION : Technical Specialist

| <u>ISSUE</u> | <u>CHANGE REF</u> | <u>DATE</u> |
|--------------|-------------------|-------------|
| 1 | - | 30/04/2002 |
| 9 | TS002730 | 31/09/2005 |
| 10 | TS002889 | 15/10/2005 |
| 11 | TS004030 | 05/09/2007 |

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1. INTRODUCTION

1.1 Purpose and Scope

This handbook describes the ST4S/ST4R detector, part number 667/1/27663/000. Refer to section 7 for related part numbers.

1.2 Glossary

| | |
|--------|---|
| STC | Siemens Traffic Controls |
| VA | Vehicle Actuated |
| SDE/SA | Speed Discrimination Equipment and Speed Assessment |
| UTC | Urban Traffic Control |
| SCOOT | Split Cycle Offset Optimisation Technique |
| HA | Highways Agency |

1.3 Reference documents

667/HE/20663/000 Installation Handbook No. 3 (Detectors and Loops)

2. GENERAL DESCRIPTION

The ST4S/ST4R detector is a scanning 4 channel inductive loop detector with a single Eurocard outline, which is suitable for detecting motor vehicles, motorcycles and pedal cycles. It conforms to the British Highways Agency Specification TR0100A.

The Front Panel has the following features:-

- Three sensitivity switches per channel
- One presence time switch per channel
- Reset button (recessed to prevent accidental operation)
- Lamp button - to activate LEDs
- Detect LEDs (On for 'detect')
- Correct operation LEDs(On for 'no-fault' - off for 'fault')

Front panel control switches allow changes to sensitivity levels and presence times for each channel. For changes to be effected, the detector must be reset.

A switch on the pcb allows selection of 2 presence time ranges.

The detector will be operational within five seconds from power up or reset, and any fault outputs set in the detector will be cleared. All outputs are forced to the 'detect' state during the 3 seconds after reset to aid controller commissioning.

The detector may be reset by pressing the 'Reset' button on the front panel, or by going through a power-down, power-up sequence.

Individual channels can be 'switched off' by setting all three sensitivity switches for the required channel, to the 'on' position. This ensures that the output gives a permanent 'no detect' signal and will prevent any interference with other working channels or detectors.

Detection LEDs and 'correct operation', i.e. 'no-fault' LEDs are provided to indicate the status of each detector channel. **The LEDs are enabled for 20 minutes**, by pressing the 'LED Enable' button on the front panel, thus conserving energy.

Protection against induced voltages caused by nearby lightning strikes is provided by gas discharge tubes.

On-board switches are provided for each channel to change the loop frequency to minimise interaction between adjacent detector units.

Note – The ST4R detector channel's normally open/normally closed outputs are provided by relay contacts whilst the ST4S detector channel outputs are derived from a solid state switch. The circuitry to control the solid state switches on the ST4S is contained on a 'daughter card' fitted to the main PCB.

The operation of the ST4R and ST4S is identical and the two types are fully interchangeable.

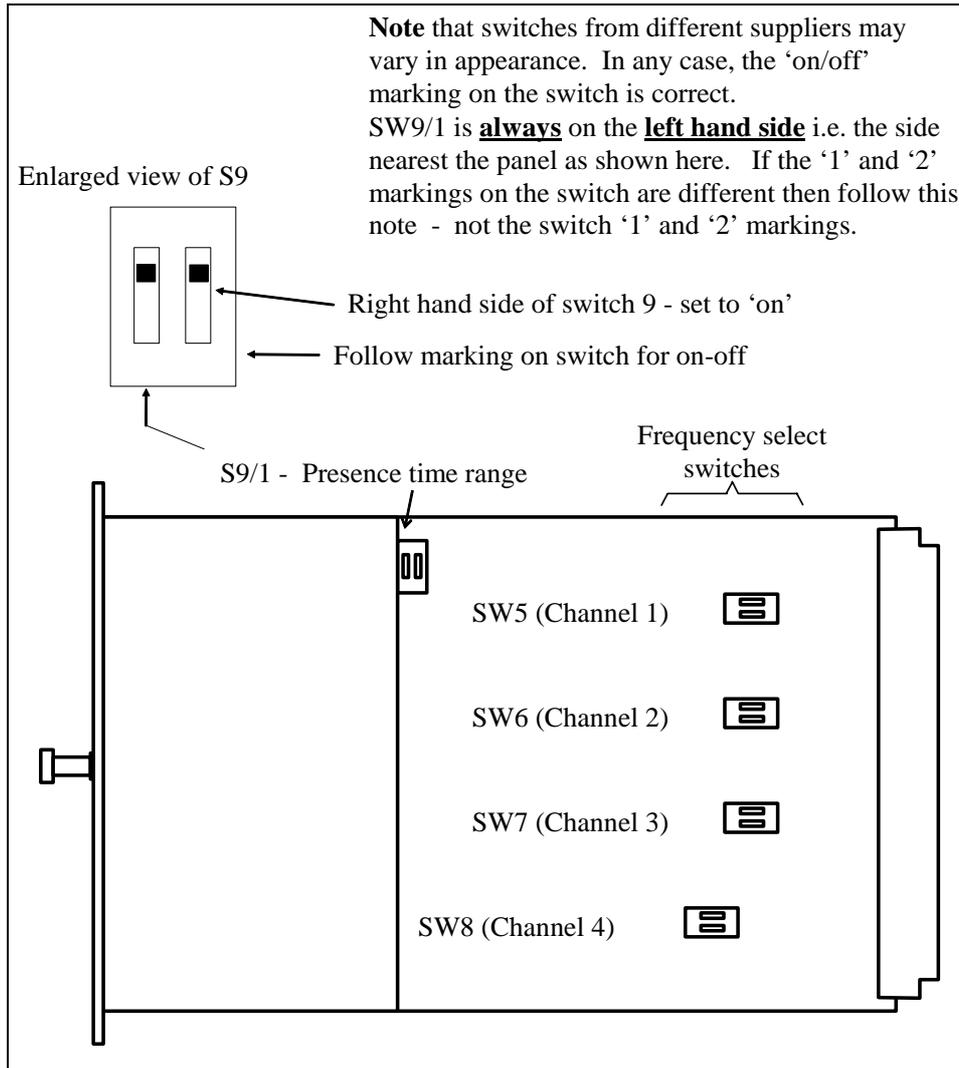


Diagram showing Switch locations

3. SPECIFICATION

3.1 Specifications

| | |
|---------------------------------------|--|
| Power Supply and Current (typ) | Either:- 18-30vdc, at 100mA current Or: 16.5-27.6vac 50Hz at 140mA ** |
| Power Supply Current (typ) (LEDs off) | Either:- 70mA dc Or: 100mA 50Hz ac |
| Size | 160mm x 100mm x 25mm |
| Loop Inductance Tuning Range | 50 to 300 μ H (plus feeder inductance) |
| Feeder Length | 0 - 300 metres. See Appendix for details of longer feeders. |
| Operating Frequency | 20kHz to 110kHz |
| Vehicle Speed Range | 0 to 129 km/h using loops as specified in 7th Edition Specification for Highway Works. |

****See warning note in section 3.3 regarding earthing the zero volts.**

3.2 Controls

| | | | | |
|--|--|--------------------------|----------|---------------------------|
| Front Panel Sensitivity Switches (one per channel) | 3 off two-position switches set sensitivity (7 settings), and channel off | | | |
| Switch numbers | S1 | S2 | S4 | Sensitivity Δ L/L |
| | on | on | on | Channel Off |
| | off | on | on | 0.01% (not normally used) |
| | on | off | on | 0.02% |
| | off | off | on | 0.04% |
| | on | on | off | 0.08% |
| | off | on | off | 0.16% |
| | on | off | off | 0.5% |
| | off | off | off | 1.0% |
| Front Panel Presence Time Switch (one per channel) | Switch P selects short or long presence time according to on-board presence range switch setting | | | |
| On board Presence time range switches | Sets presence time range for all 4 channels | | | |
| S9/2 on | S9/1 on | 2 hours or 35 minutes | | |
| | S9/1 off | 4 minutes or 3.5 seconds | | |
| Front Panel LED Enable Button | Push Button activates LEDs for preset time (20 minutes) | | | |
| Front Panel Reset Button | Operates on all four channels | | | |
| On Board Frequency Mode Switches | Mode | switch 1 | switch 2 | |
| | 1 (High) | off | off | |
| | 2 | on | off | |
| | 3 | off | on | |
| | 4 (Low) | on | on | |

3.3 Connector Pinout

| | Function | Pin | Function |
|-----|----------------------------------|-----|----------------------------------|
| a1 | Channel 1 Output Normally Closed | b1 | |
| a2 | | b2 | Channel 1 Output Common |
| a3 | Channel 1 Output Normally Open | b3 | |
| a4 | | b4 | |
| a5 | Channel 1 Loop | b5 | |
| a6 | | b6 | Channel 1 Loop |
| a7 | | b7 | |
| a8 | | b8 | Channel 2 Output Normally Closed |
| a9 | Channel 2 Output Common | b9 | |
| a10 | | b10 | Channel 2 Output Normally Open |
| a11 | | b11 | |
| a12 | | b12 | Channel 2 Loop |
| a13 | Channel 2 Loop | b13 | |
| a14 | | b14 | Chassis Ground |
| a15 | Channel 3 Output Normally Closed | b15 | |
| a16 | | b16 | Channel 3 Output Common |
| a17 | Channel 3 Output Normally Open | b17 | |
| a18 | | b18 | 24vAC Supply** |
| a19 | Channel 3 Loop | b19 | |
| a20 | | b20 | Channel 3 Loop |
| a21 | 24vAC Supply** | b21 | PCB Address Bit 1 * |
| a22 | | b22 | Channel 4 Output Normally Closed |
| a23 | Channel 4 Output Common | b23 | |
| a24 | | b24 | Channel 4 Output Normally Open |
| a25 | SCI Txd * | b25 | SCI Txd * |
| a26 | | b26 | Channel 4 Loop |
| a27 | Channel 4 Loop | b27 | |
| a28 | SCI Rxd * | b28 | SCI Rxd * |
| a29 | Reset | b29 | PCB Address Bit 2 * |
| a30 | PCB Address Bit 3 * | b30 | +24vDC or +12vDC Supply |
| a31 | +5v Output (Non HA Requirement) | b31 | PCB Address Bit 4 * |
| a32 | PCB Address Bit 5 * | b32 | Zero volts dc Supply |

* Facility included in this table and on the pcb, but not supported by the firmware on this variant.

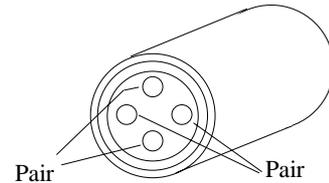
Note that when operating the detector using the 24v ac option, the detector board zero volt internal reference is derived from the output of a bridge rectifier. In STC traffic controllers the 24v ac provided for detector power is earthed. This is a safety precaution as this supply is frequently wired to external above-ground detectors. Consequently the detector internal zero volts (24v negative) has 50Hz ac on it. The zero volt connection b32 should not be commoned between boards **and must not be connected to the controller zero volts or to earth. If it is required to connect test equipment to the detector, the user must be aware of this situation and avoid connecting the internal detector zero volts to earth. **Otherwise destructive failure of the bridge will occur.**

4. INSTALLATION

4.1 Loop Installation

It is recommended that installation of the loops be in accordance with 667/HE/20663/000 - Installation Handbook No. 3 (Detectors and Loops).

Note that multi-pair feeder cables must not be shared between 2 or more detector cards. When using 2-pair cable the pairs are the opposite conductors - see diagram.

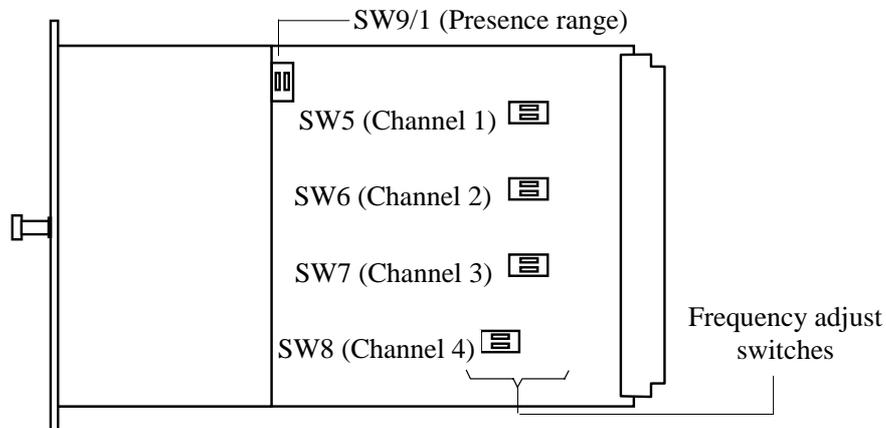


In the case of 3 or more pairs, the pairs are twisted, then the pairs are twisted together to make up the total cable.

Note that the principle is to achieve mechanically and electrically stable loop/feeder installations. The conductors must not be able to move in the slots, there should not be lengths of loop tails laid untwisted in ducts or soft sand.

4.2 Detector installation

- Set all frequency adjust switches (SW5 - SW8) to the off position



Note that switches from different suppliers may vary in appearance. In any case, the 'on/off' in the table above corresponds to the 'on/off' marking on the switch. S9/1 is **always** on the **left hand side** i.e. the side nearest the panel as shown in the diagram above. If the '1' and '2' markings on the switch are different then follow this note - not the switch '1' and '2' markings.

SW5 - 8 may require readjustment during commissioning.

- Set the presence range switch, S9/1 to the table column 3 :-
- Set the front panel presence time switches (marked 'P' on the front panel) to column 5 of the table:-

| Application | Time | S9/1 | S9/2 | Front panel 'P' |
|--|--------------------|------|------|-----------------|
| Traffic signal junctions 'VA' and Portable signals | 4 minutes | off | on | off |
| Pedestrian crossing 'VA' | 4 minutes | off | on | off |
| Car Parks | 35 minutes | on | on | on |
| SDE/SA | 4 minutes | off | on | off |
| Count and Occupancy (UTC) | 4 minutes (count) | off | on | off |
| Queue (UTC) | 35 minutes (queue) | on | on | on |
| SCOOT | 4 minutes | off | on | off |
| As required – not for use on UK public roads | 2 hours | on | on | off |

Note that the on-board switch affects all channels equally whereas the front panel switches affect only the individual channel. The location of the on-board switch is indicated by the side panel text..

- Fit board in position, check that backplane connector is engaged and tighten the two retaining screws.

Warning:- It is not recommended that the detector be fitted with the power on. However if ignoring this recommendation, be aware that when installing into a rack without card guides, the back side of the pcb may come into contact with adjacent metalwork. This usually results in destruction of one or more semiconductor devices. Such damage is outside the terms of the warranty.

5. COMMISSIONING

5.1 Preliminary

Disable unused channels by setting the relevant sensitivity switches to ‘on-on-on’ - see section 3.2.

Note that after changing the front panel switch settings it is necessary to operate the reset pushbutton for the change to take effect.

5.2 Settings

- Set sensitivity for each channel

The settings in the table are general recommendations. They may need to be modified if unusual road surface conditions or loop sizes and/or feeder lengths are encountered:-

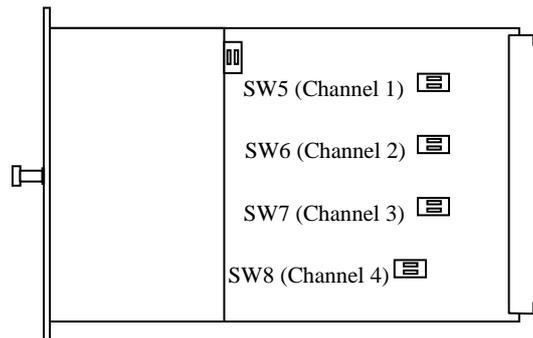
| Application | Sensitivity ($\Delta L/L$) | Notes |
|--|------------------------------|---|
| Traffic signal junctions ‘VA’ and Portable signals | 0.02% | Bicycle detection required. |
| Pedestrian crossing ‘VA’ | 0.04% | Bicycle detection not required |
| Car Parks | 0.04% or 0.08% | Bicycle detection not normally required |
| SDE/SA | 0.04% | Speed accuracy not affected by sensitivity setting |
| Count, Queue and Occupancy (UTC) | 0.04% or 0.08% | Use higher setting for better rejection of adjacent lane detection. |
| SCOOT | 0.08% | See STC Loop installation handbook |

| S1 | S2 | S4 | Sensitivity $\Delta L/L$ | Application |
|-----|-----|-----|--------------------------|--------------------------------|
| on | on | on | Channel Off | |
| off | on | on | 0.01% | Not normally used |
| on | off | on | 0.02% | VA & bicycle detect, Stop Line |
| off | off | on | 0.04% | VA - no bicycle detect |
| on | on | off | 0.08% | SCOOT |
| off | on | off | 0.16% | Not normally used |
| on | off | off | 0.5% | Not normally used |
| off | off | off | 1.0% | Not normally used |

Notes: After altering any switches it is necessary to reset the detector by operating the reset pushbutton.

The 0.01% setting is not normally recommended as spurious operation could occur but may be required for bicycle sensitivity on loops laid too close to metal reinforcement

- Switch on the detector, wait five seconds and check the ‘Detect’ LEDs for signs of vehicle detection. (LED on = vehicle present) Check that the ‘detect’ indications correlate with vehicles passing over the loops. To minimise the power used by the detector, the LEDs are disabled after about 20 minutes following switch on. To enable them for a further period, press the LED enable button.
- If interaction is observed with other loop detectors then adjust the on-board frequency switches, (SW5-9) of the channels that are exhibiting spurious detections.



This is done on the basis of adjust and observe the results, as the actual frequencies are determined by loop and feeder details - which may be different for the interacting detector. The switches are dual types, giving four frequencies per channel. If none of the four settings achieve a satisfactory result then adjust the switches on the interfering board. To determine which detector card is causing the interference remove the suspect card to see if the interference ceases.

There should be no interaction between detector channels on the same board because the detector scans the 4 channels in turn. If interactions persist then check the loop/feeder installation - see section 4.1. See also Appendix C for the recommended set up procedure for multiple ST4S/ST4R detector packs.

- Check that the ‘correct operation’ LEDs (designated as ‘F’ on the front panel) are illuminated whenever the LEDs are active (LED enable button operated within the last 20 minutes). Note that these LEDs are illuminated for the ‘no fault’ conditions. They are illuminated if the channel is switched off. If an ‘F’ LED is off it will normally indicate a faulty loop i.e. loop conductors cut or a short circuit.

6. MAINTENANCE

No routine maintenance is required. Fault correction is by means of replacement with a working unit. Set up all switches on the new board to match the switch set-up on the old board. Remove the old board, by undoing the two retaining screws,

disconnect from backplane, and pull board out. Fit new board ensuring that connection to backplane is made, and tighten the two retaining screws.

7. PART NUMBERS

The STC part number for the ST4S/ST4R detector is 667/1/27663/000

Other related part numbers are:-

| | |
|--|-----------------|
| ST4S/ST4R Detector Printed circuit board | 667/1/27665/000 |
| Single Detector Backplane kit | 667/1/15990/003 |
| Intermediate Detector Wiring kit | 667/1/15854/000 |
| Single Detector Backplane | 667/1/17205/000 |
| *Dual Detector Backplane | 667/1/15407/002 |

* Not for new installations

Note that single detector backplanes 667/1/17205/000 issue 5 and above have provision for powering by nominal 24 volts ac (pins b18 and a21 on the detector).

8. MAINTENANCE PROVISION (MP)

PRODUCT REFERENCE

ST4S/ST4R Inductive Loop Detector.

SPECIFICATIONS

The ST4S/ST4R is designed to meet the following Highways Agency specification:

TR 0100A Appendices A to G

INSTALLATION AND COMMISSIONING

Methods of installation and commissioning are held within the following Siemens Traffic Controls document:

667/HB/27663/000 ST4S/ST4R Inductive Loop Detector Handbook

SPARES AND MAINTENANCE

All maintenance and repairs should be carried out in accordance with the following Siemens Traffic Controls document:

667/HB/27663/000 ST4S/ST4R Inductive Loop Detector Handbook

MODIFICATIONS

There are no approved modifications apart from those listed in the following Siemens Traffic Controls document:

667/HB/27663/000 ST4S/ST4R Inductive Loop Detector Handbook

SCOPE

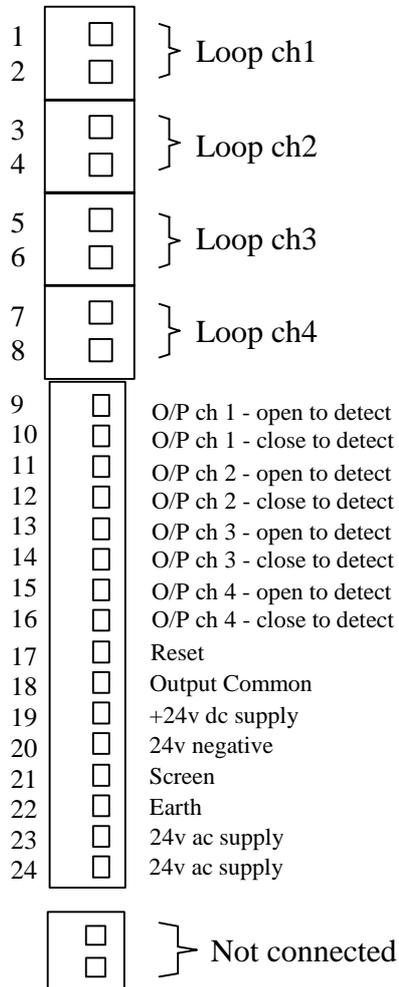
The ST4S/ST4R may **ONLY** be used for **NON-Motorway** use.

WARNING

Use of components other than those permitted above or modifications or enhancements that have not been authorised by Siemens Traffic Controls may invalidate the statutory approval of this product.

Appendix A - Backplane connections

Using STC Backplane 667/1/17205/000



Appendix B - Effect of Long Feeders

Summary

Feeder lengths more than 300m may be used provided that detection of bicycles and motorcycles is not required.

Motor vehicles with 4 or more wheels will be detected on loops covering 1 to 4 lanes on up to 750m of feeder. This is provisional on loops being installed according to the recommendations in 667/HE/20663/000.

In particular when installing loops on heavily reinforced concrete the sensitivity will be reduced if the spacing of loop conductors from the reinforcing bars is less than specified. Also where a tarmac surface includes furnace slag the sensitivity will be impaired. Both of these effects will be made worse by long feeders.

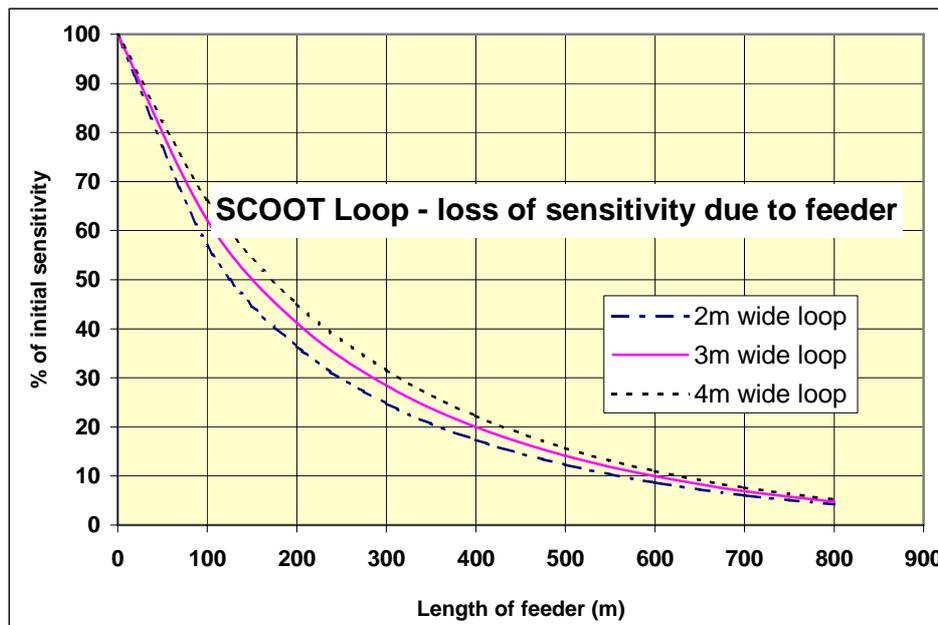
The following information is provided for users who require to use the detector outside of the normal working parameters.

Effect of feeder length

The ST4S/SR4R will function with almost any feeder length but it's apparent performance will decrease with increasing length. This is because the detector functions by measuring the percentage change of inductance as seen at it's terminals. The loop inductance is altered when metal objects (vehicles) enter the loop. However adding feeder cable increases the apparent inductance at the detector terminals – and this additional inductance is not affected by the vehicle. As only part of the inductance is changing, the effect is to reduce the sensitivity of the detector.

The ST4S/ST4R was tested on 300 metres of feeder during the type approval procedure. It can detect bicycles crossing a 3 lane chevron loop with this feeder length when set for maximum sensitivity.

For applications where detection of bicycles and motorcycles is not required (e.g. SCOOT) feeder lengths greater than 300m may be used. In order to overcome the loss of apparent sensitivity, the detector may be set to a more sensitive setting than normal. The diagram below illustrates the loss of sensitivity with increasing feeder length.



Other factors that adversely affect sensitivity are the presence of concrete reinforcing mesh and the presence of blast furnace slag in tarmac.

Putting loops in reinforced concrete surfaces is standard practice and the sensitivity of the detector is adequate for this. However the effect of long feeders on sensitivity adds to the effect of steel reinforcing mesh and the user must be aware of the risk of combining risk factors.

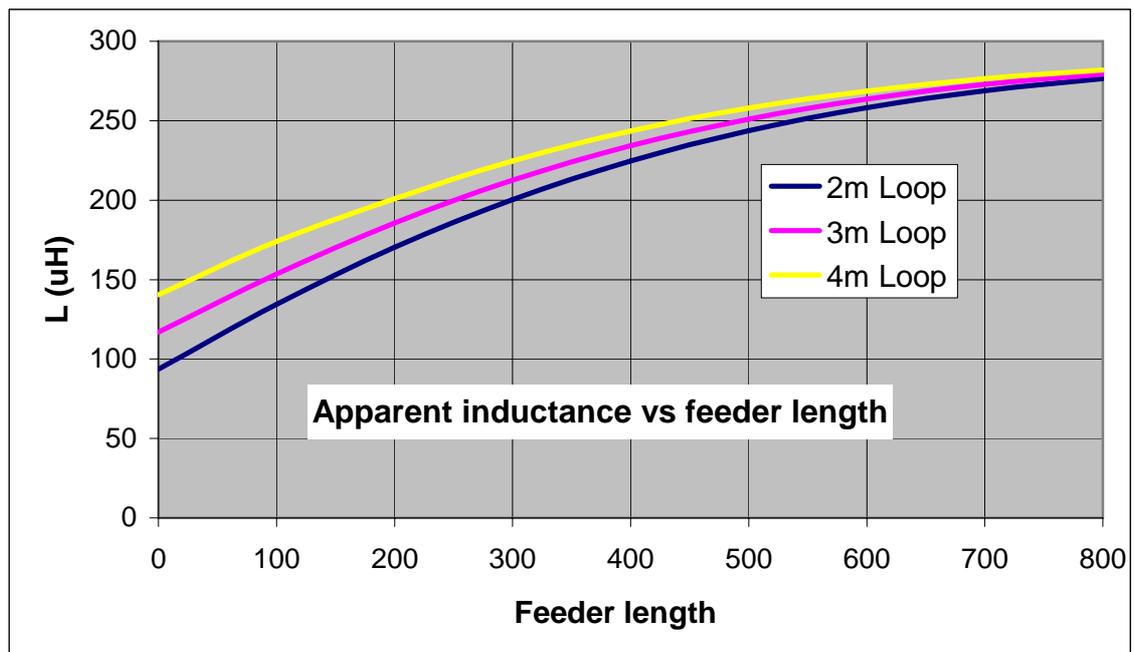
Maximum inductance

Long feeders increase the apparent inductance as seen at the detector terminals. (Note that measurement of inductance with an LCR meter is invalid for this purpose as these operate at a low fixed frequency - usually 1kHz - and the detector is not a true inductance measuring device). Large values of inductance restrict the use of the frequency setting switches (SW5/6 etc). The limits of allowable inductance are shown below:-

| Sn/1 | Sn/2 | Minimum inductance | Maximum inductance |
|------|------|--------------------|--------------------|
| off | off | 34uH | 1200uH |
| on | off | 24uH | 850uH |
| off | on | 14.5uH | 525uH |
| on | on | 12.5uH | 445uH |

where Sn = S5, S6, S7 or S8.

The graph below is a guide to the apparent inductance as seen by an ST4S/ST4R for SCOOT loops of different widths:-



Appendix C – ST4S/ST4R Loop Detector Set Up

Introduction

In the event of incorrect set up, Siemens ST4S/ST4R detector packs (667/1/27665/000) can suffer from ‘chattering’ relays and incorrect vehicle detection, especially at sites implementing MOVA, and particularly where long adjacent cables to loops are split across ST4S/ST4R cards.

Procedure

The following procedures should be followed when installing and commissioning ST4S/ST4R Loop Detector cards (667/1/27665/000) and at any sites that are exhibiting the above symptoms :-

- 1) Ensure that any multi-pair feeder cables are only connected to one ST4S/ST4R card.
- 2) Ensure that there are no lengths of conductor pairs laid untwisted in ducts or soft sand.
- 3) Ensure that Presence Time Switches SW9 and ‘P’ on the Detector card are set as stated below for the required presence time:
 - a) Presence Time – **3.5 Seconds**
SW9/1 – ‘off’
SW9/2 – ‘on’
‘P’ - ‘on’
 - b) Presence Time – **4 minutes**
SW9/1 – ‘off’
SW9/2 – ‘on’
‘P’ - ‘off’
 - c) Presence Time – **35 minutes**
SW9/1 – ‘on’
SW9/2 – ‘on’
‘P’ - ‘on’
 - d) Presence Time – **2Hrs (not used in the UK)**
SW9/1 – ‘on’
SW9/2 – ‘on’
‘P’ - ‘off’

NOTE – SW9/2 must always be set ‘on’ (This switch is reserved for future applications)

- 4) Ensure that the Frequency select switches SW5, SW6, SW7 and SW8 are set as follows:
 - On first card in rack – ALL SW5-8 - OFF
(High Frequency)
 - On next card in rack – ALL SW5-8 – ON
(Low Frequency)

On next card in rack – ALL SW5-8 – OFF
(High Frequency)
On next card in rack – ALL SW5-8 – ON
(Low Frequency)
Continue along the rack setting SW5-8 on
each card in the sequence as defined above.

- 5) Ensure that the front panel Sensitivity Switches are set as follows:
 - a) For SCOOT and MOVA loops ONLY (Sensitivity – 0.08%), set
S1 – ON
S2 – ON
S4 – OFF
 - b) For Stop Line loops (Sensitivity – 0.02%), set
S1 – ON
S2 – OFF
S4 – ON
 - c) For VA (No Bicycle Detect) (Sensitivity – 0.04%), set
S1 – OFF
S2 – OFF
S4 – ON

- 6) Once the Detector Cards have been setup, ensure that the cards are powered up for at least 10 minutes and then investigate the status of the ‘Detect’ LEDs on the front panels under varying traffic conditions. The LED should light to show a vehicle presence over the loop but no ‘flickering’ of these LEDs should be experienced at any time!

The above rules are for guidance and should resolve most problems encountered. If the symptoms persist, further support action will be necessary.

Related Documents

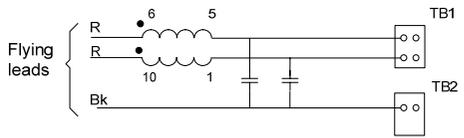
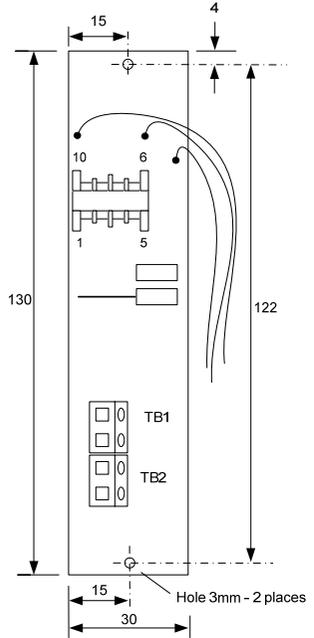
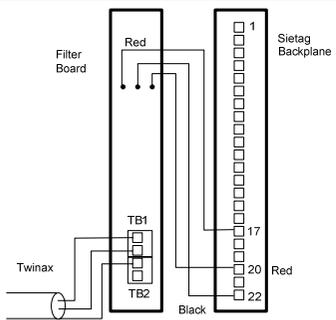
Technical Bulletin TB41-0089 – 24 volt wiring of the 11” and 19” Detector Backplanes

Appendix D – Sietag Reader Filter

Sietag Readers have been known to generate spurious interference in the Medium Wave band which in adverse conditions can be picked up by vehicle detector inductive loops. In extreme cases this could result in false vehicle detections by detector packs connected to the affected loops, or mask valid detections, or produce permanent demands, or no demands. However it should be noted that where ST4S/ST4R installations have followed the correct set up guidelines and the loops have themselves been correctly installed to 667/HE/20663/000 - Installation Handbook No. 3 (Detectors and Loops); such interference is very unlikely to cause a problem.

For extreme cases where despite following recommended guidelines, interference remains a problem, a filter can be fitted to the Sietag Reader to reduce it, at the expense of a reduction in operating range of Sietag.

See drawing 667/GA/30202/000 Sietag Filter Board

| <h3 style="margin: 0;">CIRCUIT DIAGRAM</h3>  | <h3 style="margin: 0;">Items list</h3> <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>Description</th> <th>Supplier No.</th> <th>Qty</th> </tr> </thead> <tbody> <tr> <td>1 Inductor 3.6mH</td> <td>Farnell 353-2343</td> <td>1</td> </tr> <tr> <td>2 Capacitor 1.5nF 500v</td> <td>Farnell 868-024</td> <td>2</td> </tr> <tr> <td>3 GP Cct board</td> <td>RS 434-627</td> <td>A/R</td> </tr> <tr> <td>4 Wire 16/2mm Red</td> <td></td> <td>A/R</td> </tr> <tr> <td>5 Wire 16/2mm Black</td> <td></td> <td>A/R</td> </tr> <tr> <td>6 Terminal Block</td> <td>703/4/02699/003</td> <td>2</td> </tr> <tr> <td>7 Screw</td> <td>991/4/01524/089</td> <td>2</td> </tr> <tr> <td>8 Cable tie cradle</td> <td>915/4/09480/000</td> <td>2</td> </tr> </tbody> </table> | Description | Supplier No. | Qty | 1 Inductor 3.6mH | Farnell 353-2343 | 1 | 2 Capacitor 1.5nF 500v | Farnell 868-024 | 2 | 3 GP Cct board | RS 434-627 | A/R | 4 Wire 16/2mm Red | | A/R | 5 Wire 16/2mm Black | | A/R | 6 Terminal Block | 703/4/02699/003 | 2 | 7 Screw | 991/4/01524/089 | 2 | 8 Cable tie cradle | 915/4/09480/000 | 2 |  <h3 style="margin: 0;">Layout</h3> |
|---|---|--|--------------|----------|---|------------------|--------|---|-----------------|---|----------------|------------|-----|-------------------|----|-------|---------------------|----------|------------|------------------|-----------------|---|---------|-----------------|---|--------------------|-----------------|---|--|
| Description | Supplier No. | Qty | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 Inductor 3.6mH | Farnell 353-2343 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 Capacitor 1.5nF 500v | Farnell 868-024 | 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 GP Cct board | RS 434-627 | A/R | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 Wire 16/2mm Red | | A/R | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 Wire 16/2mm Black | | A/R | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 Terminal Block | 703/4/02699/003 | 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 Screw | 991/4/01524/089 | 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 Cable tie cradle | 915/4/09480/000 | 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <h3 style="margin: 0;">Build Instructions</h3> <p>It is not necessary to follow the exact construction as detailed here. This drawing shows the form of construction used for the first batch of boards. It is necessary to keep to the circuit diagram and to use suitable components: The capacitors must be of at least 500v rating and have low losses at 100kHz.</p> <p>The circuit board may be stripboard or plain board with hand wiring between components. Good quality glass fibre board should be used</p> <p>The mounting centres must be as drawn to fit on rear of a 3U chassis.</p> <p>The circuit is wired as a common mode filter - the inductor connections are crucial.</p> <p>Include a copy of this drawing with each batch of filters.</p> | <h3 style="margin: 0;">Connection diagram</h3>  | <h3 style="margin: 0;">Installation</h3> <p>Where Readers are installed in a 3U rack, fit the board on the back of the rack using the screws and tywrap saddles supplied.</p> <p>Where remote housings are used, contact Technical Services at Poole for advice.</p> <p>If converting an existing site, remove the twinax from the Sietag backplane. Twist the flying leads from the filter board and wire to the Sietag backplane as shown in the connection diagram. Connect the Twinax feeder to the terminal block on the filter board as shown</p> <p>A reduction in operating range may occur when using this filter. Providing the tags still work correctly when installed on the vehicles, this may be ignored.</p> <p>When using this filter, interference should not be audible on a portable radio receiver tuned to medium wave stations when placed 2 metres from the closed case and from the feeder route. There may be some audible pickup within 5 metres of the loop. If excessive interference is still apparent refer to Technical Services at Poole.</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <h3 style="margin: 0;">Notes</h3> <p>This filter may be used to reduce radio interference generated by Sietag Readers in sensitive locations. It is not intended to be used where the problem is caused by Readers with an abnormally high spurious output. It provides protection from spurious common mode currents generated by the reader r.f. O/P stage. These currents have a high harmonic content (covering the medium wave broadcast band).</p> | <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:15%;">DRAWN</td> <td style="width:15%;">A C</td> <td style="width:15%;">DATE</td> <td style="width:15%;">17/02/2005</td> <td style="width:15%;">FINISH</td> <td rowspan="4" style="width:20%; vertical-align: top;"> <small>TOLERANCE UNLESS OTHERWISE STATED</small> <small>TOLERANCE</small> <small>GENERAL REQUIREMENTS TO SIEMENS PLC SPECIFICATION 2000/SH00008</small> <small>ALL DIMENSIONS IN mm.</small> </td> </tr> <tr> <td>CHECKED</td> <td></td> <td>ISSUE DATE</td> <td></td> <td></td> </tr> <tr> <td>APPROVED</td> <td>CW</td> <td>SCALE</td> <td></td> <td>MATERIAL</td> </tr> <tr> <td>E.C.N. No:</td> <td></td> <td>ISSUE</td> <td>1</td> <td></td> </tr> </table> | | DRAWN | A C | DATE | 17/02/2005 | FINISH | <small>TOLERANCE UNLESS OTHERWISE STATED</small> <small>TOLERANCE</small> <small>GENERAL REQUIREMENTS TO SIEMENS PLC SPECIFICATION 2000/SH00008</small> <small>ALL DIMENSIONS IN mm.</small> | CHECKED | | ISSUE DATE | | | APPROVED | CW | SCALE | | MATERIAL | E.C.N. No: | | ISSUE | 1 | | | | | | | |
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| E.C.N. No: | | ISSUE | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <h3 style="margin: 0;">SIEMENS PLC</h3> <p style="margin: 0;">Sopers Lane, Poole, Dorset, England.</p> <h3 style="margin: 0;">TITLE</h3> <h2 style="margin: 0;">SIETAG FILTER BOARD</h2> <h3 style="margin: 0;">DRAWING NUMBER</h3> <h1 style="margin: 0;">667/GA/30202/000</h1> <p style="margin: 0;">THIS DRAWING HAS A VISIO COMPUTER MASTER</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |