Customer Handbook

Vehicle Activated Traffic Calming Signs

UNIPART DORMAN

Table of Contents

TROUBLESHOOTING FLOWCHARTS

1. Introduction

1.1 Pre-requisites

If you are installing VATCS hardware you must perform the following tasks:

Manage your own safety and the safety of other personnel.

Gather the required equipment and organise/implement Traffic Management arrangements as required by the specific site conditions, and any Federal/Local laws or regulations in force at the time of installation.

Have experience installing electrical equipment at height.

1.2 Important Safety Information

Please review the following information before installation.

WARNING

READ ALL INSTRUCTIONS BEFORE USE AND SAVE THIS MANUAL FOR FUTURE REFERENCE. If you require further copies please contact Unipart Dorman.

VATCS units must be installed and adjusted in accordance with the installation instructions contained in this Handbook.

Installers are required to ensure that all Federal and Local regulatory requirements are fully complied with prior to and during the installation, and also in the day to day operation of the equipment.

Use the VATCS only for the applications it was designed and supplied for.

Changes or modifications not expressly approved by Unipart Dorman could void any warranty or guarantee on the equipment.

Safety Information

The following safety information and warnings enable you to avoid potential harm to yourself and others; and possible damage to the equipment, being installed/maintained.

This should not be considered to be an exhaustive list of hazards you may encounter with the equipment and should never be considered as a substitute for your judgment and experience or any current legislative requirements.

Please read and observe all the safety information and instructions contained in this manual before installing or operating any equipment. You should keep this handbook in a safe place for future reference.

If you are unsure about any part of this installation or of the potential hazards listed, please contact Unipart Dorman immediately using the details at the back of this handbook.

This section contains important information to help you recognize, understand and mitigate some of the risks involved with installing and maintaining a VATCS sign.

Please read all the following safety advisory messages before carrying out any work on this equipment.

To reduce the risk associated with electric shock injury.

Operate any AC Power isolation equipment fitted to support structures.

Open the white fuse barrels located on the DIN Rail illustrated in section 2.3 to isolate the equipment within the sign.

All electrical equipment must be serviced by suitably qualified personnel. Specifically, someone with previous training or who has received factory training on these or similar types of equipment, such that they thoroughly understand the techniques, tools, and methods required to properly service this equipment.

Qualifications should be valid where there is a time expiry clause attached to them.

Battery acid may cause skin irritation and eye injury. To reduce the risk of burns or other acid related injury resulting from handling lead-acid batteries:

Wear approved gloves, goggles, and an apron when handling batteries

Beware of cracked battery cases

Handle batteries with care.

Always use the recommended charging systems.

Ingesting Battery acid may cause severe irritation and injury to the digestive tract. To reduce these hazards:

Beware of cracked battery cases

Handle batteries with care

Do not allow any foodstuffs to be stored near batteries

To reduce the environmental risks associated with the improper disposal of batteries containing lead and acid:

Please dispose of batteries in strict accordance with all national and local government laws/regulations.

Radar Radio Frequency (RF) energy can be harmful to the eyes.

To reduce exposure to the risk of RF energy, do not stare into the Moving vehicle detector (MVD) radar antenna. Maintain a minimum safe distance of 20cm (8-inches) from the radar antenna when the sign is powered.

An accidental short circuit may instantly heat conductive jewellery, tools, etc to skin-burning temperatures. Furthermore, flammable material near to the site of the short circuit may ignite causing a spread of fire. To reduce this risk when working on live equipment**:**

Keep tools, jewellery, and other conductive objects away from the battery terminals and/or live equipment.

To reduce the risk of impact hazards resulting from falls, accidents with passing vehicles, and from unstable equipment:

Use appropriate traffic control methods, work equipment, and procedures.

Strain or back injury may result from lifting equipment incorrectly.

To reduce the risk of strain or back injury, always use proper lifting techniques and have adequate help. Strong consideration should be given to the use of mechanical lifting equipment such as cranes during installation.

To avoid the possibility of injury due to falling or unstable equipment:

Be certain the sign is mounted to an appropriately rated pole or equivalent mounting surface.

Use appropriately rated mounting hardware.

NOTICE

This equipment has been tested and found to comply with the limits for a class B digital device, pursuant to Part 15 of the FCC Rules on electronic interference. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions provided, may cause harmful interference to radio communications. However, there can be no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, the user should attempt to correct the interference by one or more of the following methods:

Re-orient or relocate the receiving antenna.

Increase the separation distance between the equipment and the receiver.

If difficulty is still experienced isolate the equipment consult Unipart Dorman   for further assistance.

Changes or modifications not expressly approved by Unipart Dorman could void the user's authority to operate the equipment and invalidate any warranty.

1.3 Scope of this Document

This documentation provides the following information for VATCS:

Setup and Operation

Troubleshooting

Installation of VATCS hardware may require that you work above the ground on a ladder or access device. Please make sure you have all the required equipment and are aware of potential safety issues before starting any installation. DO NOT install any VATCS hardware if you are unsure how to complete the installation or lack appropriate safety equipment.

Unipart Dorman does not recommend installing this hardware during inclement weather.

Every effort has been made to ensure the accuracy of the information given in our Publications, but in accordance with our policy of continually improving our products we reserve the right to modify designs and specifications whenever necessary.

Every care is taken to ensure that, as far as reasonably practical, equipment supplied will perform without risk to health. It is essential that accepted codes of professional practice are followed in the assembly, installation and commissioning of the equipment. If in doubt with respect to any of these instructions, please consult Unipart Dorman before installing the device. Unipart Dorman reserves the right to vary or modify any specification without prior notice.

Please note that equipment and components described in this document are protected by patent and no part of this document may be reproduced in any form without the written permission of Unipart Dorman.

1.4 Description

VATCS are electronic vehicle speed activated LED road side signs which are directly targeted, and proven to have an effect on lowering driver vehicle speeds.

The signs incorporate warning signs and symbols from the Standard Highway Signs Manual Edition - 2004 for use with the Manual of Uniform Traffic Control Document (MUTCD) 2003. The warning signs and symbols comprise of high resolution displays using high intensity coloured LEDs. Additionally all layouts and drawings are compliant with MUTCD regulations.

The signs are available with a speed data logging analysis feature which is described in more detail in a later section of this document. The feature allows the user to collect speed data at the sign site. The data logger can be operated with the sign in both covert and operational mode which allows the user to collect 'before' and 'after' data for performance evaluation purposes.

The signs can also be uploaded with a switching timetable created by the Unipart Dorman Desktop V-AMP application. This allows VATCS deployed in School or Work Zones to automatically synchronize with the School or workers timetable. The VATCS will automatically adjust for seasonal time changes.

The signs are supplied as standard with dual AC/Solar 'plug and play' compatibility to suit both urban and rural site applications.

Shown overleaf is a schematic diagram which depicts the interfacing of the various components which go to make up a VATCS unit.

1.5 Schematic Diagram
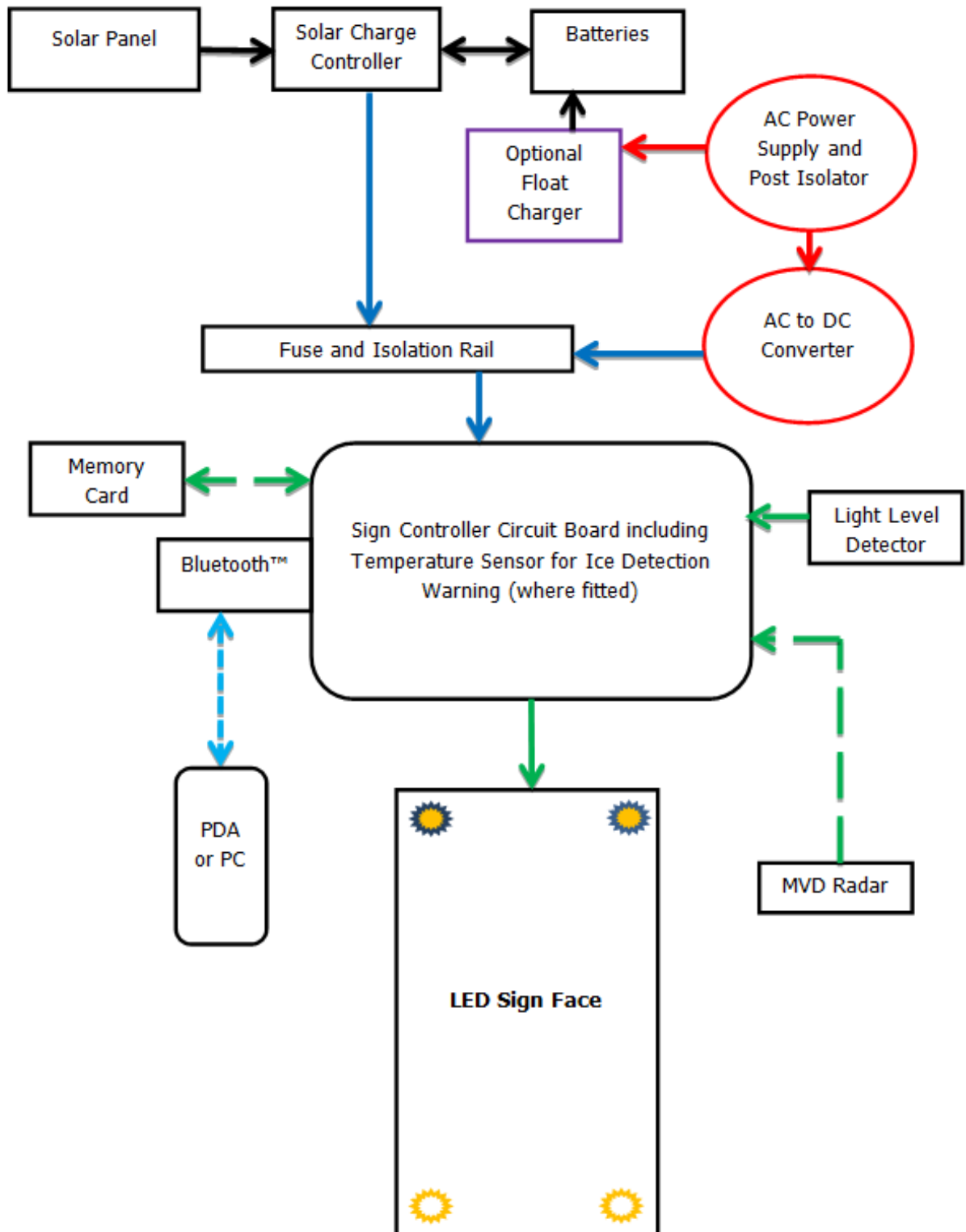
1.6 Firmware Version

The firmware version and serial number is appended to a yellow decal on the main PCB

2. Installation

Prior to Installation commencing it is highly recommended that the installer undertakes a site survey evaluation and a full health and safety risk assessment covering installation, operation and maintenance.
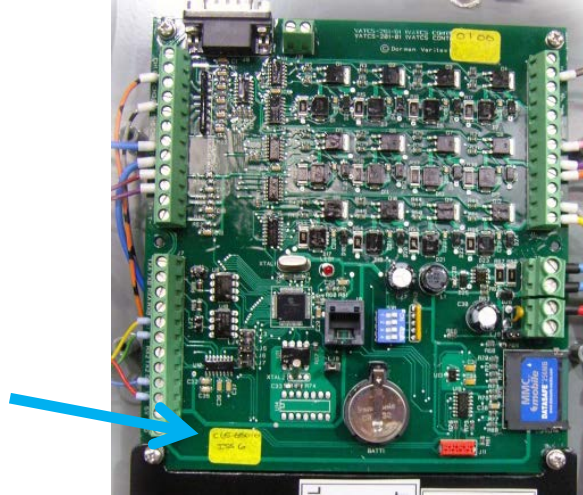
2.1 Installing VATCS

Mark a chalk line on the mounting post at 7 ½ ft/2.28m from the level of the road surface, this will be the height of the bottom of the sign. For optimum alignment, the sign display face should be pointing at the centre point of the approach traffic lane, at a range of between 300ft (92M) and 500 ft (150M) from the sign. In the case of a dual lane approach, use the dividing centre line of both approach lanes.

> **Handy hint:** Place a cone at both 300ft (92m) and 500 ft (150m) points from sign at the road edge and aim the sign anywhere in between these points at the centre of the approaching traffic stream.

Signs are normally specified with Sign Fix Channelling as the mounting hardware and are installed with ¾" / 19mm banding using SX0220 banding adaptors. Unipart Dorman recommends that dual bands are used on the top and bottom brackets for additional strength. The sign can also be affixed using Signfix U brackets to ease frequent dismantling and re-deployment of the VATCS.

It should be noted that the preferred mounting method in Florida is to use pre-drilled Z section and U Bolts as detailed in FDOT Design Standard 11860, and this should be consulted before installation commences.

2.2 Installing the Solar Panel

Important note: Given an average 3 solar hours per day falling onto one of our standard 80W solar panels which is pointing due south with a clear view of sky; the sign will provide continuous power for ADT one direction volumes of up to 7000, when it is used with the standard 4 cell 80amphr battery reservoir. If this is insufficient for your needs please contact Unipart Dorman for further advice.

Prior to physical mounting of the solar panel, it is recommended that the separately provided plug and play solar power lead is connected to the Solar Panel before lifting the panel into position.

The panel mounting bracket is assembled using the manufacturer's instructions included with the bracket.

The spacing between the two cross members which attach to the post should be set at 18″/ 457mm. This will give an angle of approximately 45 degrees from the panel to the vertical support post. The angle of the panel can be adjusted if required for seasonal solar changes, i.e. 30 to 45° in summer and >45° in winter.

The bottom cross member of the side of pole bracket should be mounted at least 12″/ 305mm above the top of the sign.

Please note: The Solar panel should be aligned to be facing directly south and have a clear 360 degree view of the sky. It is important to avoid any shadowing by trees or tall buildings.

Any shading of the solar panel may adversely affect the ability of the batteries to supply enough power to the sign over a 24 hour period.
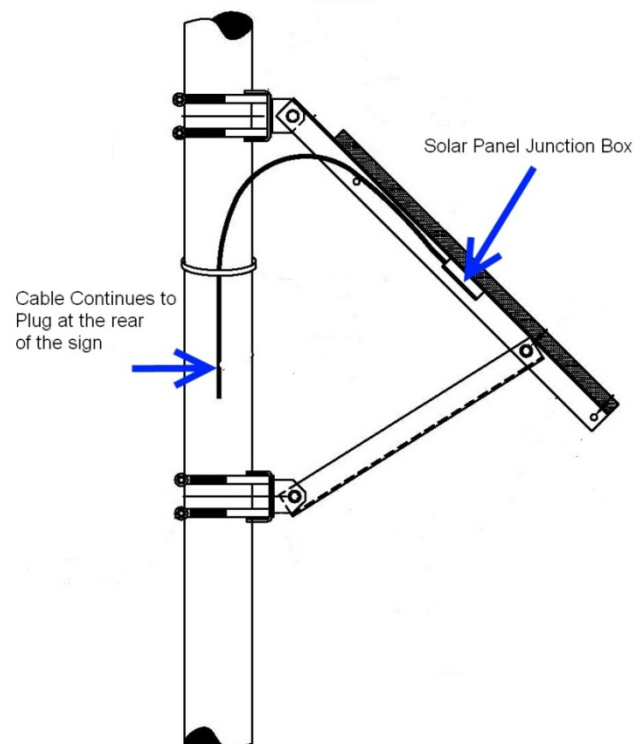
2.3 Electrical Hook Up

All VATCS within the family series are supplied as standard with Dual AC/DC (Solar) functionality, allowing clients the flexibility to select an appropriate power source to suit each VATCS site location.
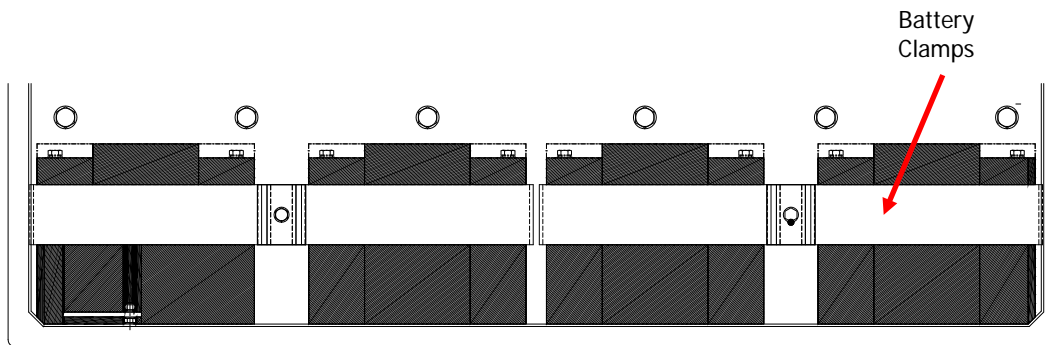
2.3.1.1 DC Solar Hook Up

Actions to install:

Open the sign with access key provided

Open all fuse barrels located on the internal power din rail by pulling each fuse carriage open

Physically clamp all 4 x 20 amp/hr 12v battery cells into position in the compartment provided internally within the bottom section of the VATCS

Battery
Clamps

Connect the sign wiring harness to the batteries, connecting the Red to Positive (+) and Blue to Negative (-) using the cable links provided to connect all batteries in parallel.

Extreme caution should be exercised during the connection of the batteries to ensure short circuits do not occur.

Open the junction box on the back of the solar panel by undoing the 4 retaining screws. Fit the ½" / 13mm plastic cable gland (provided), and then feed the cable through the gland and terminate to the screw terminal connections, ensuring correct polarity of all connections is maintained. Finally hand tighten the gland to ensure weatherproofing.

The plug end of the cable fits into the 2 pin socket on the rear of sign marked Solar Panel. Align the key and guide built into the plug and socket, and screw down the plug securing ring

fully. This will ensure proper fitment and that the IP65/NEMA Standard 4 ingress rating is preserved. Ensure dust caps are fitted to all unused sockets

Important Note: Ensure polarity of the connection lead is correct by proving with a meter **before** connecting the sign to the solar panel.

The fuse carriages can now be closed. The red Activity LED on the VATCS control board will flash to indicate that the system is being powered correctly.
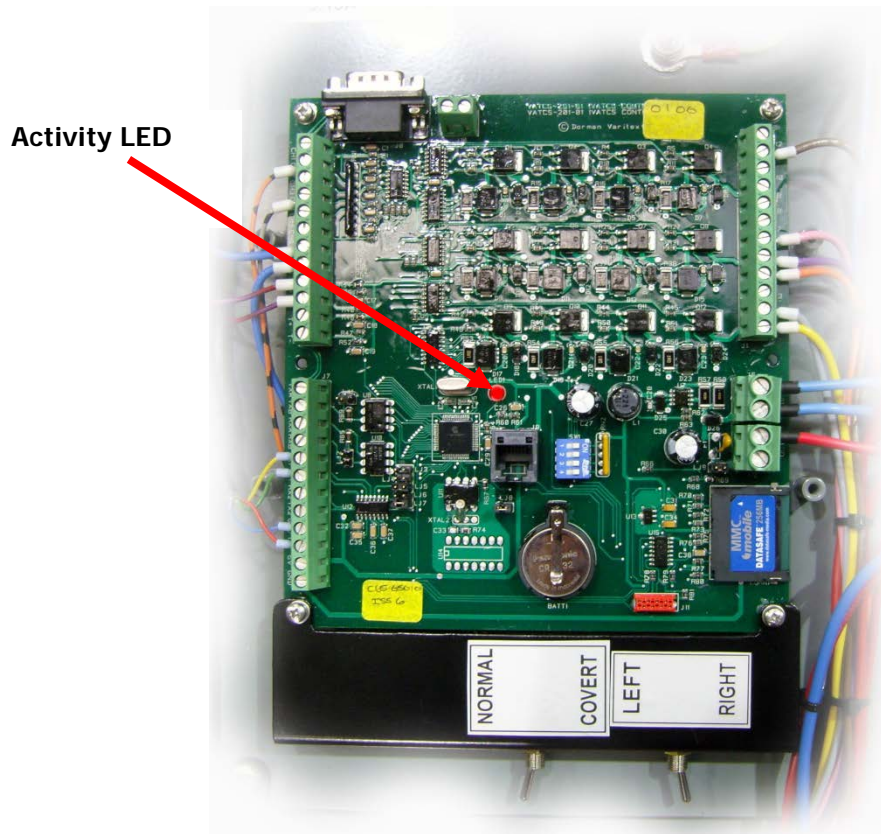
The installer should also at this point take note of the LED indicators on the SunSaver charge controller located within the sign: The green 'charging' LED will light whenever sunlight is available and indicates that the battery reservoir is being charged correctly. The green LED will extinguish at night.
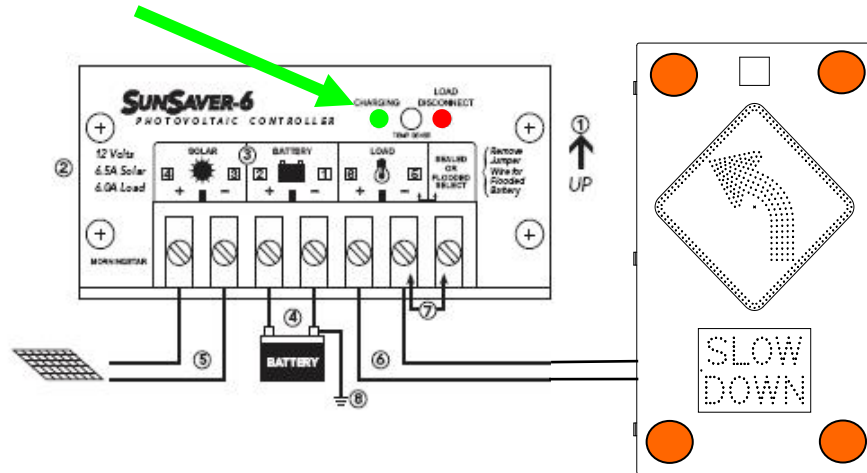

The Red 'Load Disconnect' LED will light to indicate that the charge controller has automatically disconnected the DF15 during a condition where the battery charge is low in order to prevent potential damage. The controller will automatically turn the sign back on once the battery charge has returned to acceptable levels.

2.3.1.2 Sunsaver 10

Later versions of the signs will have been upgraded to the new generation SunSaver-10L device.

The only change to the installation method is that on Dual AC/Solar devices where the sign is to be solar powered, it is essential that the fuse in position F2 is removed to allow trouble free operation.
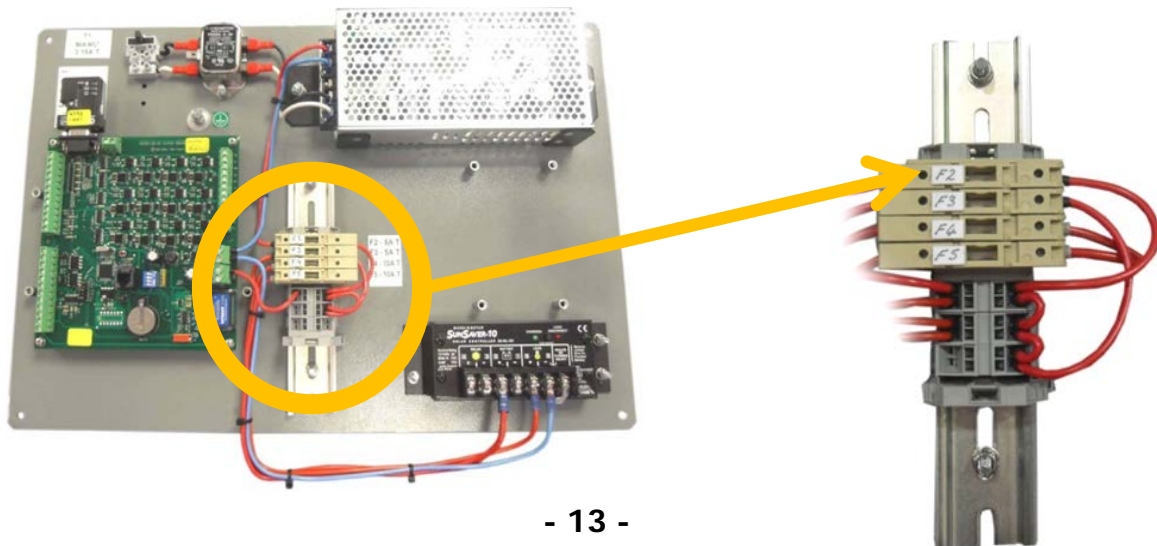
2.3.2 AC Hook Up

Actions to install:

Open sign with access key provided

Open all white fuse barrels located on the internal power din rail by pulling each fuse carriage open as shown in the section on solar hook up above

Two AC 110V entry points to the sign are available to the client:

Option 1

Via the IP65/NEMA Standard 4 rated Plug and Socket at the rear of the sign
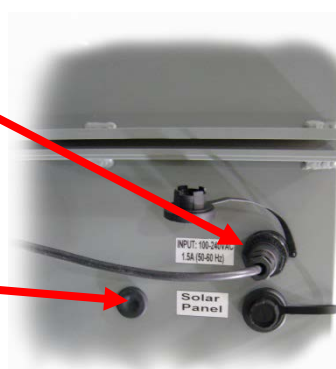
Option 1

Option 2

Option 2

Via the ¾" / 19mm entry hole which has been drilled for ½" / 13mm flexible conduit (not provided) located on the rear of sign The sign is supplied with the hole blanked off with a rubber blanking grommet.

Important Note: The following items are only to be carried out by an Approved Electrician

Option 1. Install a 3 core, 1.5mm PVC covered armored flexible cable, terminated at one end into the IP65 Plug, and at the other connected to a fuse isolated external local AC 110V supply (5amp minimum provided by others)

Option 2. Fit an approved outdoor armored flexible conduit (not supplied) between the sign conduit entry point and the fuse isolated external local (5amp minimum) AC 110V supply. (Provided by others at the rear of the sign)

Install a 3 core, 1.5mm (0.6") PVC covered flexible cable via the conduit between the external local (5 amp minimum) fuse isolated 110V AC supply and the internally labeled 110VAC VATCS F1 supply input fused screw terminal (it will be necessary to disconnect and stow the pre-connected cables leading from the 3 pin socket).
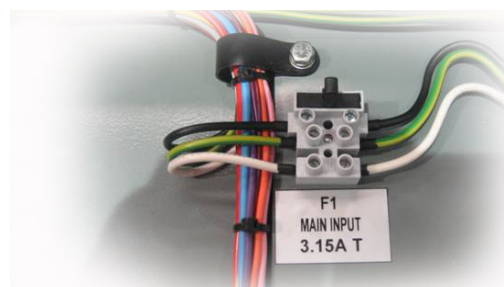
Strip back each core 6mm (1/4″) and connect the earth core into the terminal marked ⏚ (the middle terminal). Connect the live core to the live fused terminal and the neutral core into the neutral terminal. VATCS signs will operate from 100 -240V AC single phase supply. Internal Fuse rating is 3.15A.

> **IT IS ESSENTIAL THAT ALL THE TERMINATIONS AND CONNECTIONS ARE FULLY INSULATED AND THAT NO LIVE CONDUCTOR IS LEFT EXPOSED**

Follow the same instructions as above to connect into the local external fuse isolated supply. The variety of connector required is dependent on the type of isolator that has been installed. Close all fuses and ensure the red LED on the main controller board flashes continuously as shown in the solar instructions above.

2.3.3 Optional Float Charger

In areas of poor sunlight capture characteristics or where traffic volumes mean the battery power is expended too readily, an additional float charger may be specified. This unit hooks into a street lighting circuit to provide additional charging capacity during the hours of darkness.

The schematic diagram below illustrates the connection arrangement inside the sign. The Live feed should be connected via the fuse block F6 with a 3.15 Amp slow blow fuse to the Brown cable; the Earth/Ground cable to the Green and Yellow; and the Neutral to the Blue cable.
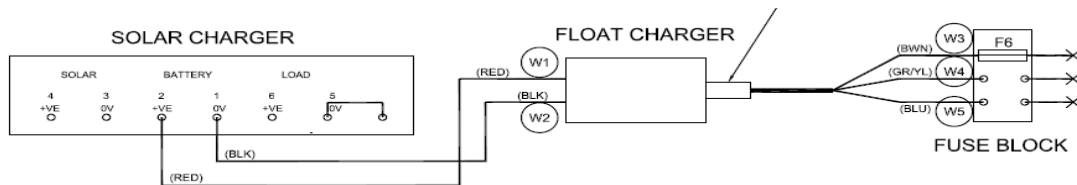
2.4 Hybrid Signs

Hybrid signs are supplied with all three methods of power available to enhance flexibility of deployment.

> **DO NOT CONNECT ALL THREE POWER SOURCES AT THE SAME TIME. IRREPARABLE DAMAGE COULD OCCUR TO THE SIGN HARDWARE WHICH MAY NOT BE COVERED UNDER WARRANTY**

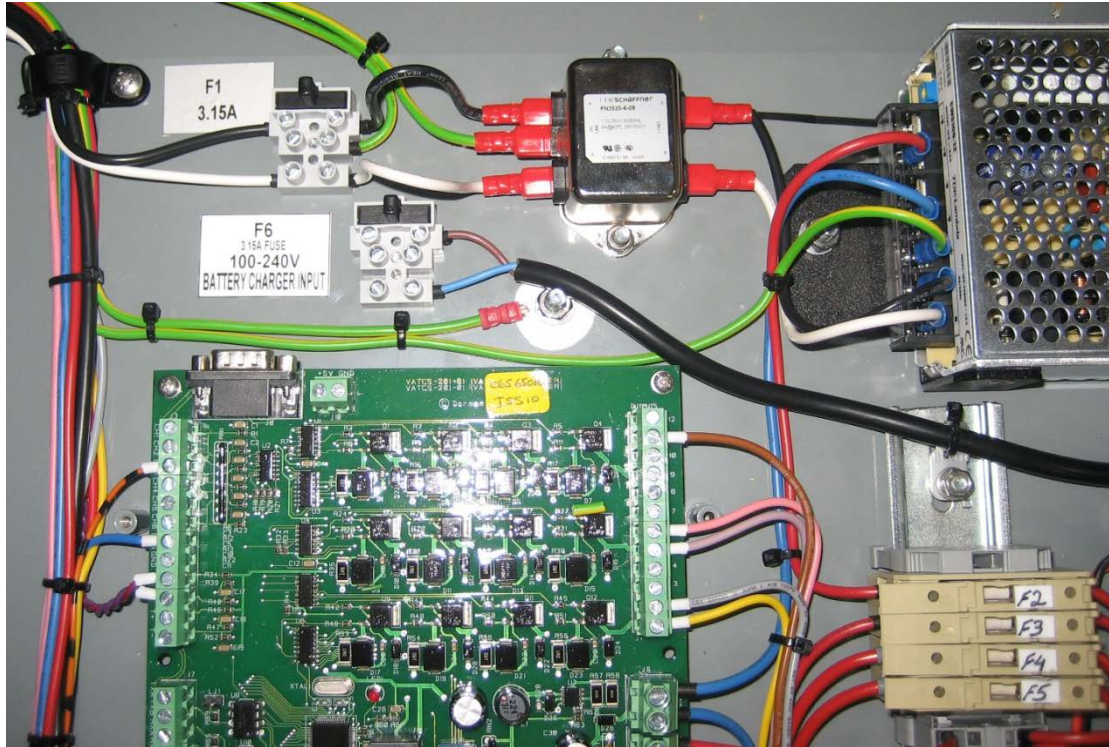Disconnection is effected by removing the relevant fuses from the positions as shown in the illustration on the next page and detailed below

For AC Power, fit fuses in positions F1 and F2

For Solar Power, fit fuses in positions F3, F4 and F5

For Float Charging assisted Solar Power, fit fuses in positions F3, F4, F5 and F6

Bluetooth Dongle not shown for illustrative purposes

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3.0 Configuration and Setup

This section provides a guide to configuration of VATCS once physical and electrical power supply procedures have been completed.

Please note that when using the Bluetooth Link, if a pairing code is required then the signs are set with the code **0000** prior to dispatch from the factory.

3.1 Setting Normal/Covert mode

The VATCS Signs have the ability to operate in both covert and normal modes for data logging purposes. When first installed it is normal to set the sign in covert mode to allow the capture of speed data when the sign does not activate. Once a suitable amount of covert data is collected the sign may be switched to Normal mode and data collection continued and with the sign triggering as required.

Collecting data in this way will allow the operator to evaluate the performance of the signs. The data collection process is covered in more detail in a later section.

Covert and Normal modes are conducted using a manual toggle switch selector internal to the sign. This switch is clearly labeled Covert and Normal.
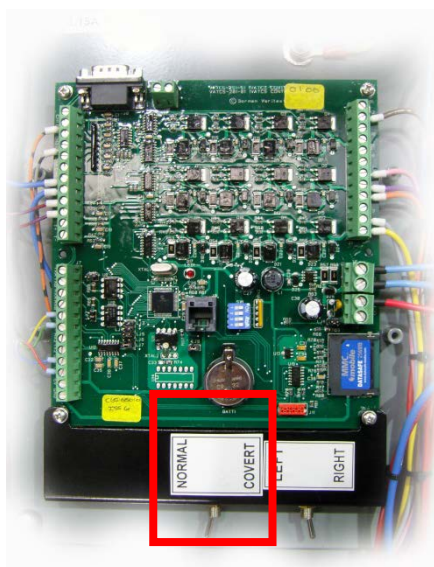
3.2 Dual Diagram VATCS Sign Selection

The dual diagram regulatory VATCS have the ability to display dual posted speed limits, this functionality is present to allow clients to alter the VATCS sign between two different speed limits or automate the dual diagram VATCS operation by uploading a schedule to the sign (using the VAMP scheduler software described further on in this handbook) for applications such as a school zones, where a lower speed limit is enforced at certain times of day.

In standard posted speed limit operating mode the operator needs to select the appropriate speed limit diagram via the internal manual toggle switch. The example shown below depicts

the toggle switch for a sign capable of showing either 20 or 25. Other signs may show different speeds or in the case of a dual curve warnings, either a left or right curve.
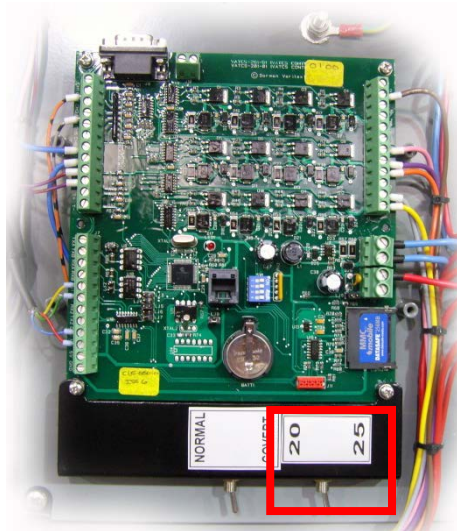
3.3 VATCS Data Logger and Scheduler

As standard, VATCS offer operators the ability to evaluate performance of the VATCS in lowering road speed, by recording speed data distribution in Covert (before) and Normal (after) operating modes.

The sign will record all activations and time and date stamp them every 3 seconds in non-volatile flash memory, this data is then recorded to a SD memory card. The maximum storage is 11 million vehicles

This raw data may be downloaded from the sign to a hand held PDA/Laptop PC operating the Datalogger application software over a wireless Bluetooth™ connection, where it can then be manipulated in Microsoft Excel to allow the operator to produce any type of report required.

The Datalogger application also allows for the upload of timetable programs commonly referred to as the 'scheduler' which are created via the Desktop V-AMP Switching Timetable Editor software, and loaded into the VATCS. This allows automated operation of the VATCS to coincide with School Zone or Work Zone timetables.

More information on the functionality of both the Datalogger Scheduler PDA and V-AMP Desktop applications are covered in the remaining section of this guide.

3.4 Data logger Scheduler Software Operating Instructions

If the Communicator software is not already pre-installed, it must be installed onto the PDA by following the PDA manufacturer's instructions. The program can be found on the CD supplied with the PDA. If the Communicator software is already installed, please go to the "Operating Instructions" in section 4 on how to run the software from the PDA. Should you

experience any difficulty with PDA software or operation please contact Unipart Dorman for assistance.

4.0 Operating Instructions – PDA

Go to the start page on the PDA and click the small blue icon on the bottom right of the display. This brings up the Bluetooth page.

The large circular button underneath the word "Bluetooth" should be green as shown on the screen illustrated. If it has a red cross striking through it, then Bluetooth is turned off. Clicking the button will turn it on and clicking the button again will turn Bluetooth back off.

Click the OK button at the top right hand side once you have finished.

If the system requests a pairing code for the Bluetooth link please enter **0000**

Set the PDA Time by clicking on the Start menu>Settings then select the System Tab at the bottom of the screen and click on Clock and Alarms

Set the Home Time Zone and correct time using the dropdowns. The unit will automatically compensate for daylight saving. Then accept the changes.

From the Start Menu please select the Datalog V5.3 Operating Software and once it is loaded click the CONNECT button. Please note that you will need to be within 15 feet of the VATCS sign in order for the Bluetooth™ to pick up a signal.

The connection screen will allow you to choose which COM Port that the device will use to communicate via Bluetooth:

The COM Port number can vary. Please follow your equipment's User Instructions for setting up COM Ports. If you experience any difficulty with this step please contact Unipart Dorman for advice.

It may take a few seconds for the software to locate all surrounding Bluetooth devices. The Bluetooth icon in the top right of this screen will spin as the software searches for devices.

If the system requests a pairing code for the Bluetooth link please enter **0000**

You will be presented with a screen asking you to select a Bluetooth device. A connection to a sign will appear here as an icon with a name that will be your unique Dorman Varitext Project No YYYY--XXX" where YYYY is project number and XXX is the no of the sign.

For Example 4321-001

To connect to the sign, select it on the screen and press the OK button. This will take you to the Main Menu

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4.1 Setting Speeds

Select the OPTIONS tab at the bottom of the screen and then using the dropdown and tick boxes the various speed settings can be set:

The Activation Timer allows the user to set a time delay measured in seconds between initial detection of a vehicle travelling above the preset trigger speed and the illumination of the display.

The Reactivation Timer allows the setting of a delay in seconds between sign activations when for instance there is a stream of traffic approaching the sign, all travelling above the trigger speed. This will separate the Sign illumination into distinct events provides a more targeted display to drivers. The combination of setting Activation/Reactivation times and selecting Power Saving can return significant power consumption savings.

To set the trigger speed at which the sign will activate the display warning, first highlight the trigger speed field with the cursor then access the keypad at bottom of screen and type in the required trigger speed.

The Get Options and Set Options allow users to retrieve the current settings installed in the sign and also to upload modified settings to the sign.

A Product Demonstration facility which allows users to see all the sign display options without vehicle trigger is available by toggling the Demo ON/OFF button.

4.2 Timetable Setting

Clicking on Select allows you to navigate to a Timetable which has been created using the V-AMP software. (Timetable creation is covered elsewhere in this Handbook).

Alternatively, the facility exists to set the sign to operate in a specific way during only the hours of darkness/daylight hours. Completing the Latitude and Longitude boxes and setting the time zone using the drop down menu will allow the system to define the correct sun up and down times. Checking either the sunrise or sunset boxes will instruct the sign to go to the sign mode selected by using the dropdown and a time offset can also be defined.

Settings for Mode A, B and Stealth operation are made in the V-AMP section of this handbook. The timetable can be enabled or disabled by using the relevant button.

4.3 Retrieving Log Files

To retrieve a log file, you first need to enter a name for the file that the log file will be stored in*.

In order to do this, click the box at the top of the display labelled "Filename" and then click the keyboard icon at the bottom of the display.

This will display a keyboard which you can use to enter the filename.

For example XXXX.MMDDYYYY Where XXXX is a unique sign identifier and MMDDYYYY is the date.

Then click on "Get Log" and the download should begin.

Note:

Depending on the size of the log being downloaded this may take some time. If the logs are taking too long to download, then consideration should be given to increasing the frequency the signs are visited at to download smaller files.

It should also be noted that the sign controller stores logs in blocks of 64. If fewer than 64 logs have been collected then no data will be downloaded.

## 4.4 Deleting a Log File

To delete the log file from the Sign, Type the Password LOGCLR into the Filename box then click the CLEAR LOG button. **DELETING THE LOG IS A ONE CLICK OPERATION AND IS PERMANENT. THE LOG FILE CANNOT BE RETRIEVED ONCE YOU HAVE DELETED IT.** The system automatically begins to log data in a new file after the previous log has been deleted
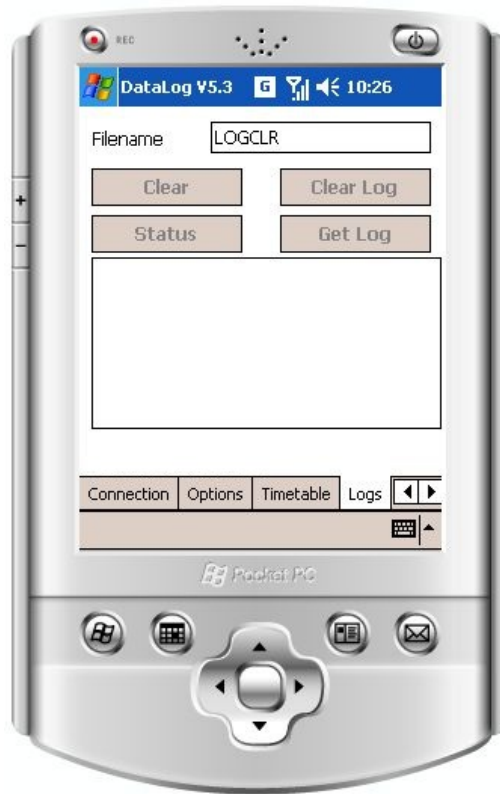
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4.5 Power Setting Tab

This tab enables users to toggle between the Standard and Power Saving settings for the sign. The parameters for these settings are normally set using the LDR and Advanced tabs which are password protected. If you would like to alter these settings please contact Unipart Dorman for password access.
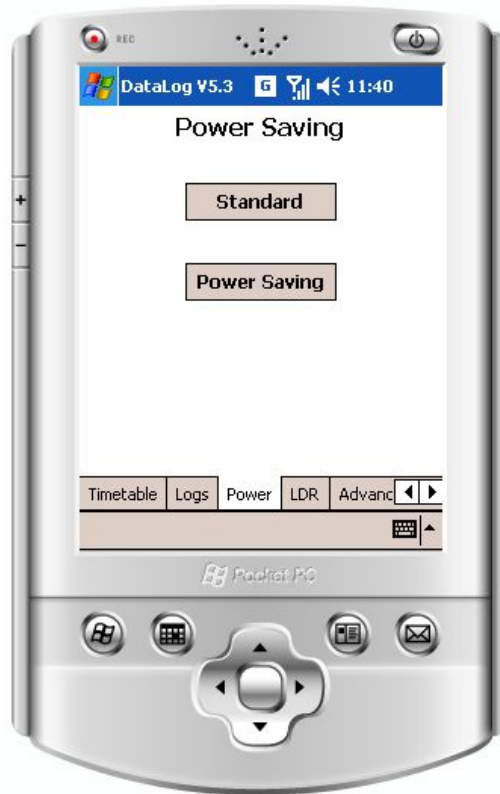

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4.6 Radar Setting Tab

VATCS signs have the capability to gather the radar unit sensitivity setting using the RadarTab by clicking on Read. Users can then adjust the sensitivity of the unit to suit local conditions using the dropdown. Clicking on Set will send the new parameter to the sign. The screenshots and instructions although specifically for PC versions of the software shown in Section 5.6 correlate directly to the PDA version.

It should be noted that at low sensitivity settings it is not possible to use a tuning fork for calibration/testing purposes.
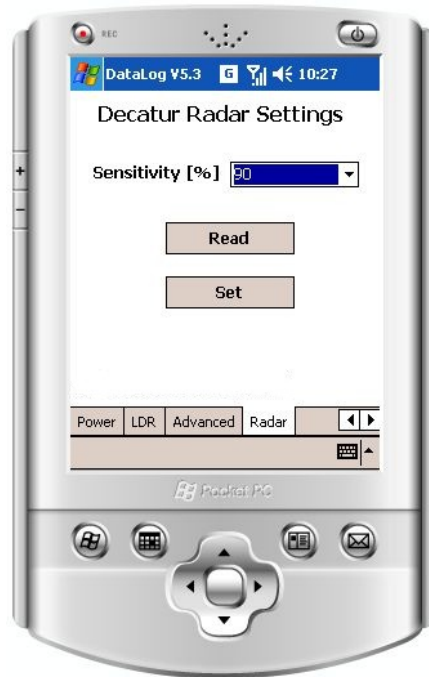
4.7 Exiting the Application

From the Connection Tab at the foot of the screen, select Disconnect to close the Bluetooth link; and then click Exit to exit the Datalogger software and return the user to the PDA homescreen.
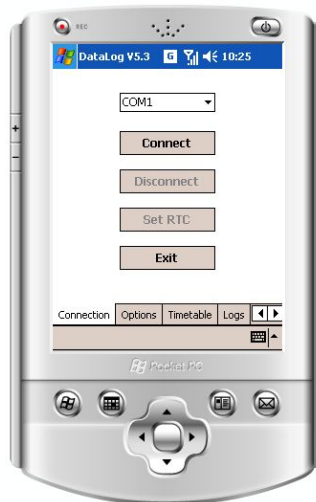
5.0 Operating Instructions Laptop/Desktop

Please consult your device's operating instructions for the method of detecting and pairing with a device using the Bluetooth communication system. Should your device ask for a pairing code for the VATCS, please enter **0000** which is the default setting for all units and is factory set.

Unzip and install the DataLog Setup software, where prompted accept and run the software and you will be presented with the Setup wizard which will guide you through the rest of the installation process

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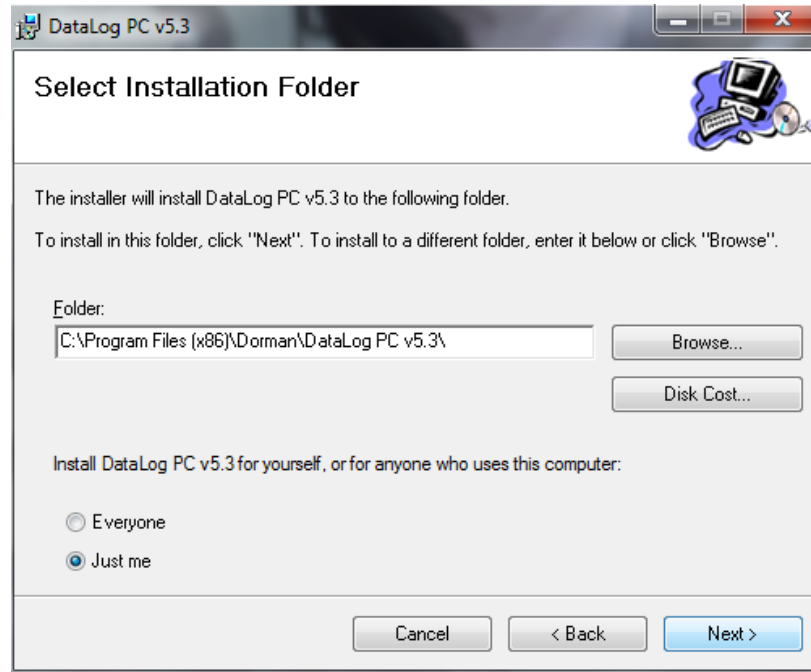
The Disk Cost Button allows users to see current disk usage and available space. This is particularly useful when deciding which folder to use to install the software into.
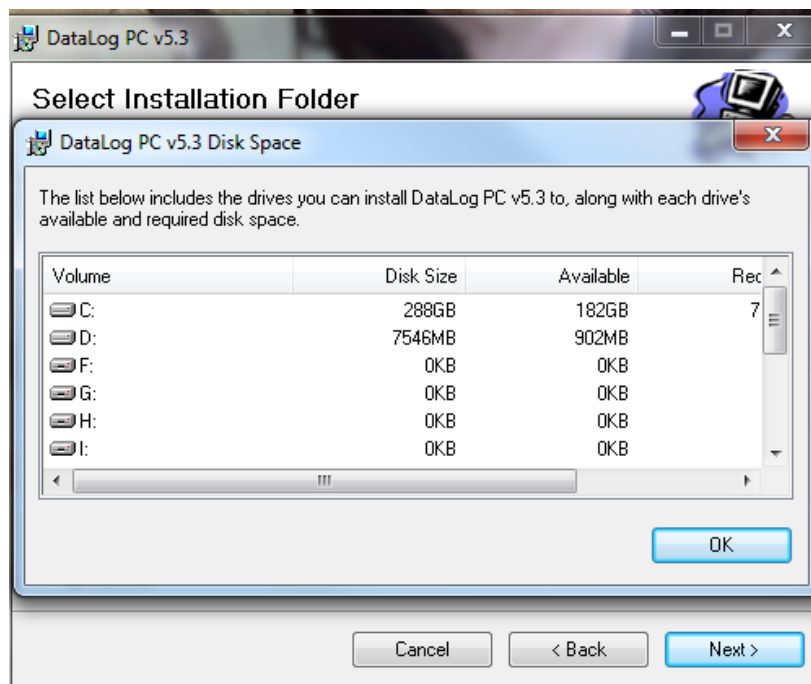
Clicking on Next will start the installation and you should accept any 'request for access' etc pop ups.

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Click on Close when the installation is complete.
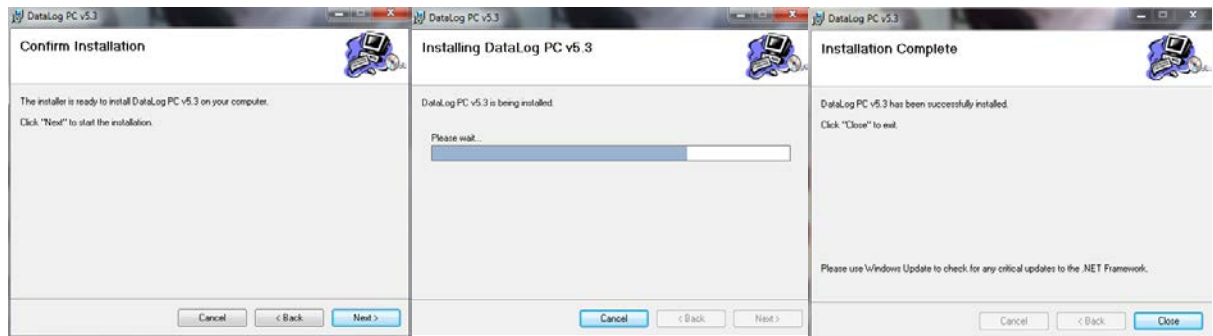
From the Start Menu please select the DataLog PC v5.3 Operating Software as shown:
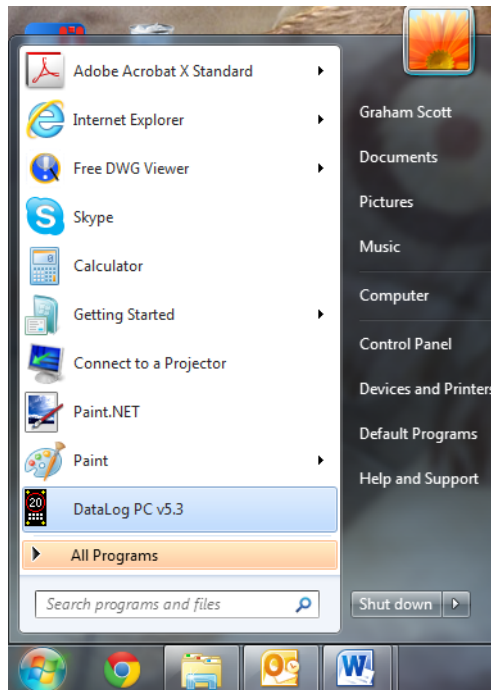
Initially, you will be presented with this screen:
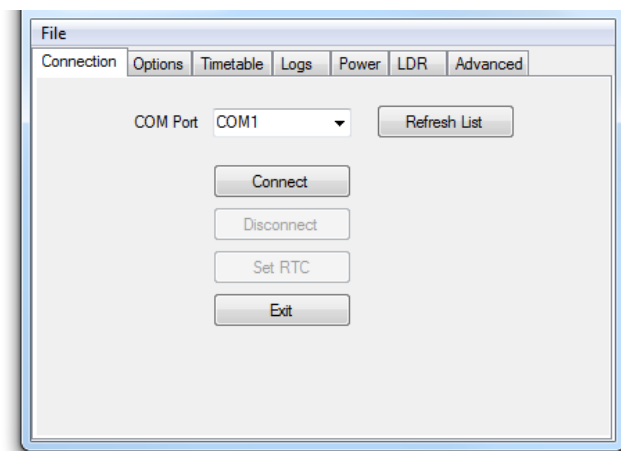
Using the dropdown, select which COM Port you will be using for Bluetooth communications and once you have done this click the CONNECT button. (The COM Port is defined by the version of Windows

you are running and also varies by Hardware manufacturer. Please follow your equipment's User Instructions for setting up COM Ports. If you experience any difficulty with this step please contact Unipart Dorman for advice).

The Set RTC button will allow you to set the system time into the Real Time Clock which will be used to time and date stamp each activation in the log.

Please note that you will need to be within 15 feet of the VATCS sign in order for Bluetooth to pick up a signal and establish a link.

If your device asks for a pairing code then please enter **0000**

5.1 Setting Basic Sign Options

First select the Options tab at the top of the screen. If Get Options is selected the parameters already loaded into the sign are displayed for editing.
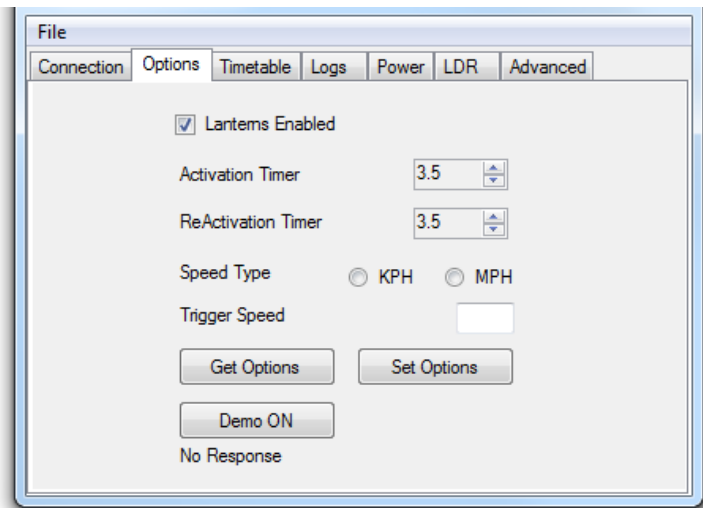

Here it is possible to select the flashing corner Beacons on or off by checking the box and to toggle between MPH or KPH using the radio buttons. The setting marked Activation Timer defines how long the display will be illuminated for, and Reactivation time is the period which will elapse between illumination events.

Set the speed at which you require the sign to trigger at and then click on Set Options, which will transfer your settings into the sign over the Bluetooth link.

Selecting Demo ON will set the sign into a demonstration mode where irrespective of the settings, the sign and Beacons will flash continuously.

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5.2 Using the Timetable Facility

Clicking on Select allows you to navigate to a Timetable which has been created using the V-AMP software. (Timetable creation is covered elsewhere in this Handbook).
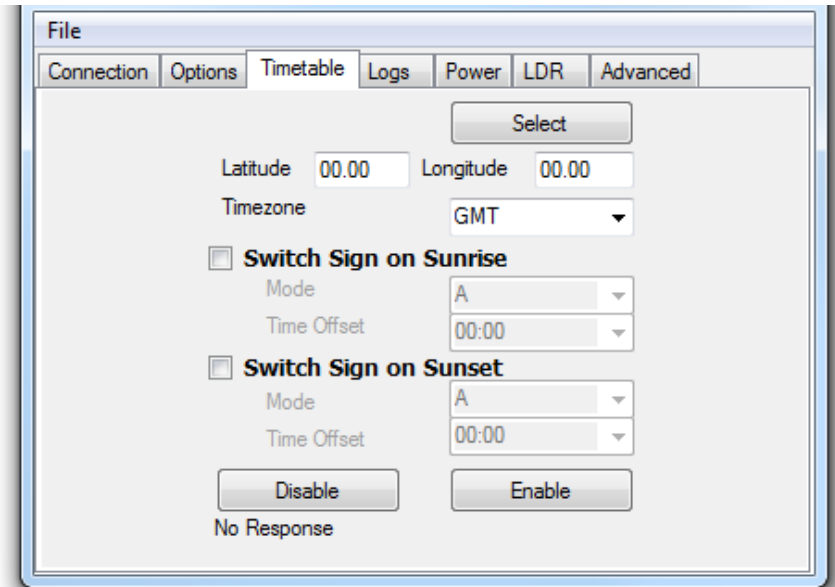
Alternatively, the facility exists to set the sign to operate in a specific way during only the hours of darkness/daylight hours. Completing the Latitude and Longitude boxes and setting the time zone using the drop down menu will allow the system to automatically define the correct sun up and down times. Checking either the Sunrise or Sunset boxes will instruct the sign to go to the sign mode selected by using the dropdown and a time offset can also be defined. Settings for Mode A, B and Stealth operation are made in the V-AMP section of this handbook.

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5.3 Retrieving Log Files

To retrieve a log file using the Logs Tab, you first need to enter a name for the file that the log file will be stored in*. If the file you want to use is not correct click on select and either find the correct file or create a new file.

*For example XXXX.MMDDYYYY Where XXXX is a unique sign identifier and MMDDYYYY is the date.

Then click on "Get Log" and the download should begin.
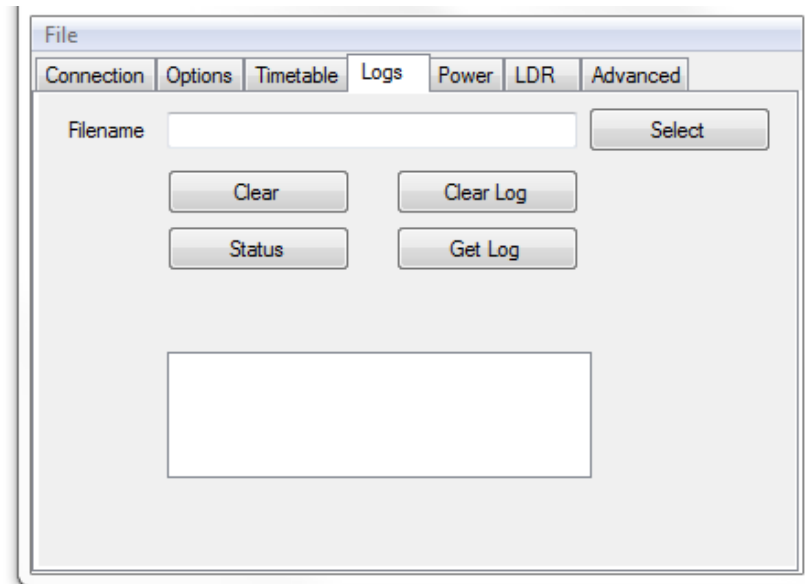
Notes:

Depending on the size of the log being downloaded this may take several minutes. If the logs are taking too long to download, then consideration should be given to increasing the frequency the signs are visited at to download smaller files.

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5.4 Deleting Log Files

To delete the log file from the VATCS, Type the Password LOGCLR into the Filename box then click the CLEAR LOG button.
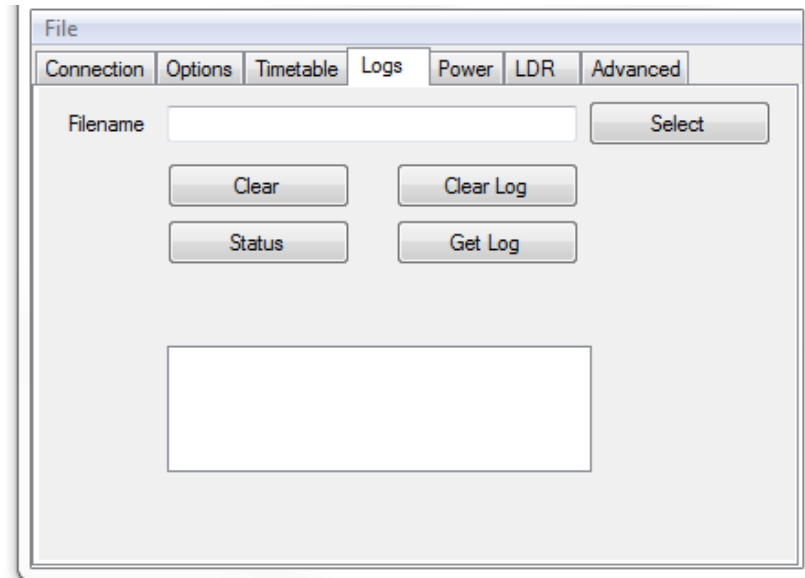
DELETING THE LOG IS A ONE CLICK OPERATION AND IS PERMANENT. THE LOG FILE CANNOT BE RETRIEVED ONCE YOU HAVE DELETED IT.

The system automatically begins to log data in a new file after the previous log has been deleted

5.5 Power Saving Option
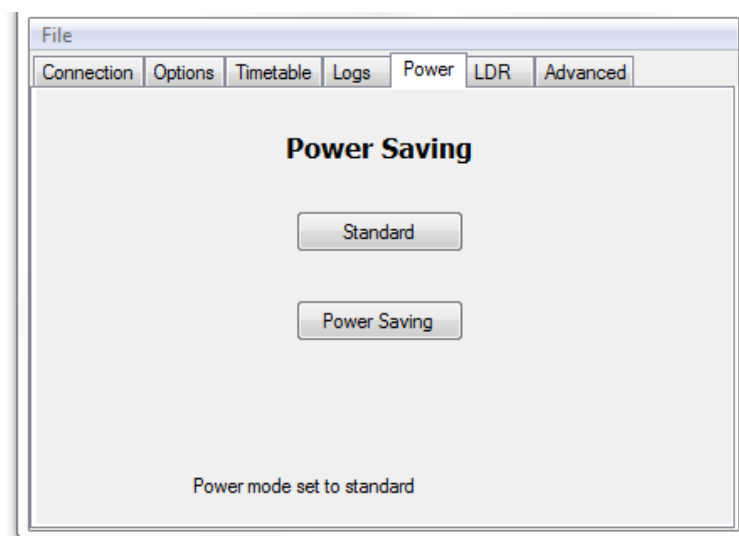
Toggling between Standard and Power Saving on the Power tab allows the brightness of the displays to be reduced slightly independent of the automatic dimming facility, and can be useful in preserving

battery life in solar powered signs.

Careful consideration of the Activation and Reactivation Timer settings can also allow savings to be made in the power consumption.

The combination of setting Activation/Reactivation times and selecting Power Saving can return significant power consumption savings.

Advice and information on power saving is available from Unipart Dorman.

5.6 Radar Settings

VATCS signs have the capability to gather the radar unit sensitivity setting from the Radar Tab by clicking on Read. (The examples shown are for the Decatur Radar unit; however the Settings and Display for the Houston Radar are the same).
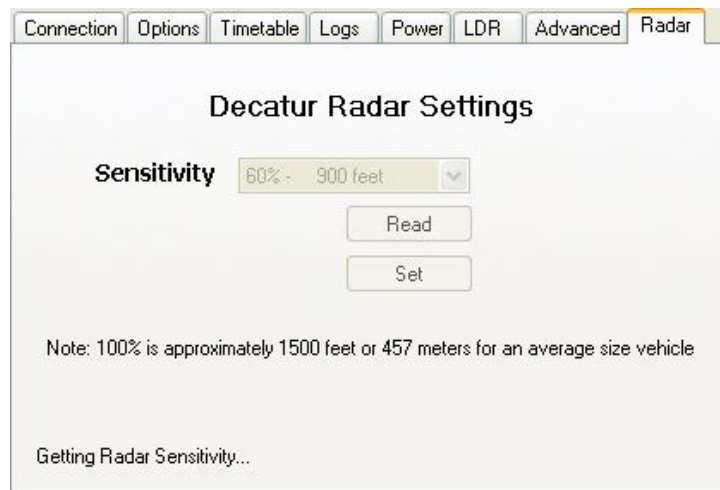
Users can then adjust the sensitivity of the unit to suit local conditions using the dropdown as shown.
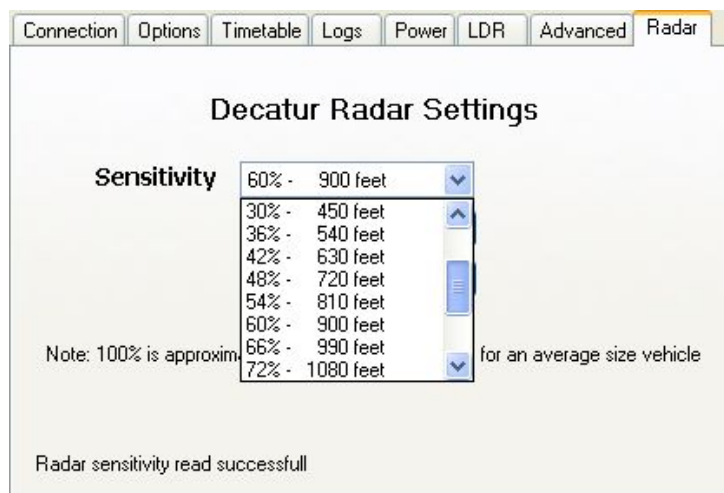
Click on the new value required and the dropdown will shrink leaving the new setting highlighted in

blue.
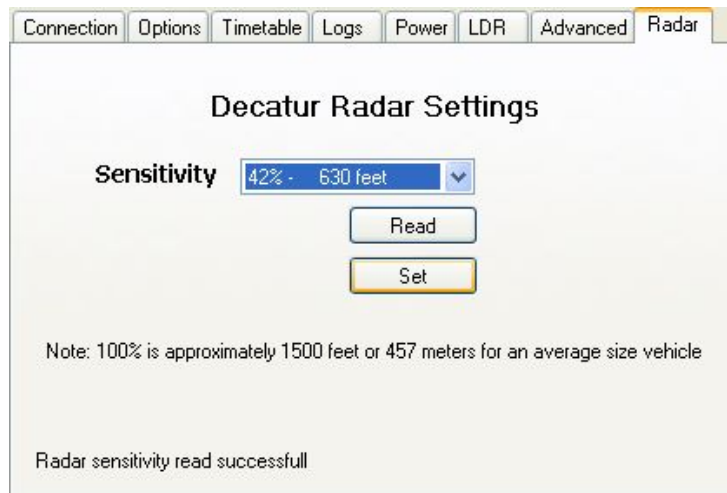
Clicking on Set will send the new parameter to the sign.

It should be noted that at low sensitivity settings it is not possible to use a tuning fork for calibration/testing purposes.

5.7 Exiting the Program

The program is exited after selecting Disconnect on the 'Connection' tab and then clicking on 'Exit'
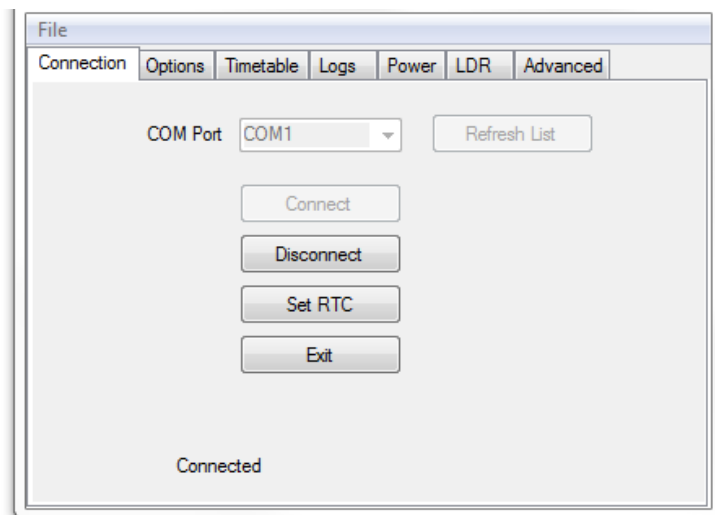
6.0 V-AMP Switching Timetable Editor

6.1 Introduction

V-AMP is the Unipart Dorman switching timetable editing application for VATCS Signs. V-AMP provides tools for designing timetables which will instruct the sign to automatically change display modes. Timetables created using V-AMP can then be uploaded to one or more VATCS wirelessly from the PDA/Laptop via a Bluetooth connection.

6.2 Overview of Timetable System

V-AMP provides a simple method of creating a switching timetable for your VATCS. Each timetable created using V-AMP will contain, as a minimum, a base timetable. The base timetable is a weekly, Monday to Sunday timetable which will repeat every week of every year.

For each day of this weekly schedule, up to 10 sign switchovers can be defined. A single switch-over defines a time at which the sign should change and to which preset parameters it should change to.

Often a weekly schedule repeating throughout the year is inappropriate for a sign's intended application. A common example of this is the occurrence of school holidays. V-AMP provides tools to allow periodic alternatives to the base timetable. And once a base timetable is set, V-AMP allows up to 40 alternative time periods to be defined.

Between the dates defined by an alternative timetable, V-AMP will override the base timetable and instead switch the sign using the alternative schedule. An alternative period can be defined in the same way as the base timetable by creating a weekly schedule which will repeat during the defined period.

6.3 Creating a Timetable

The software should be loaded from the Disk supplied and this will place an icon on your desktop. After the V-AMP application is opened by double clicking this icon, the user is presented with the following menu screen, please select the VATCS button.
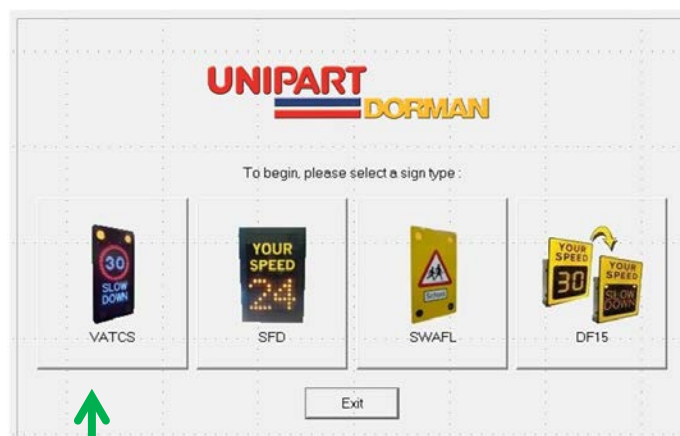
A blank timetable is presented and this allows you to begin editing straight away. If a timetable is already open, a new timetable can be created by selecting File>New Timetable from the menu bar. If the current timetable has unsaved changes, you will be prompted to save, ignore or cancel.

6.4 Creating a Base Timetable

To create the base timetable for your schedule, click on the Base Timetable tab. You will be presented with a blank schedule table as shown above.
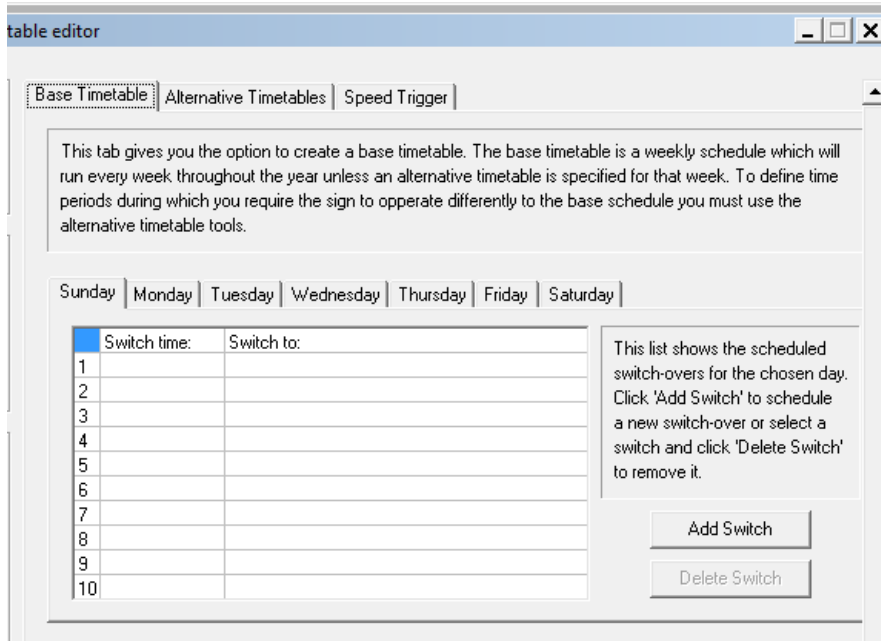
6.5 Adding a Switch-Over to a Schedule

To add a switch-over, first click the 'Add Switch' button.
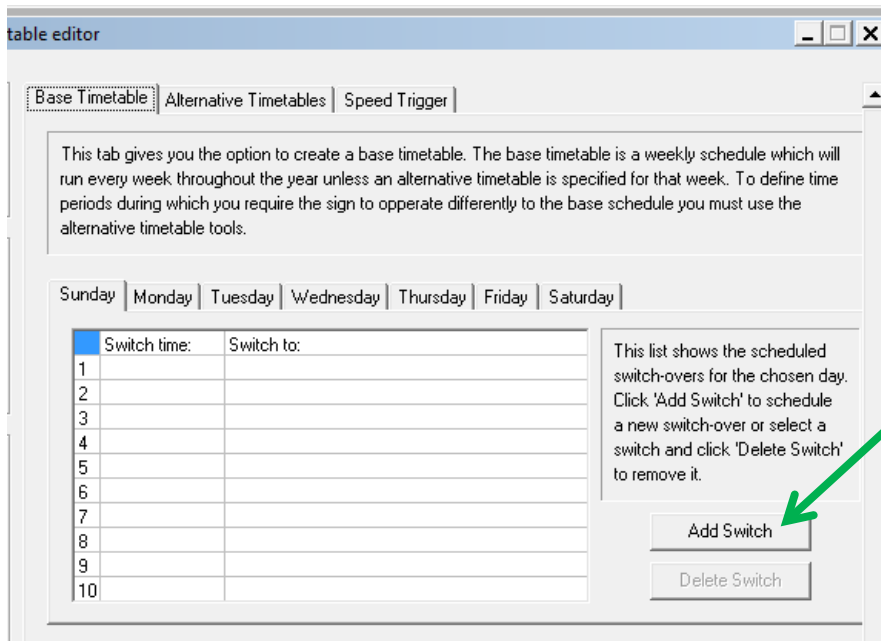
A new window will appear as shown below, giving the various options relating to the switch. The switch-over can be applied to multiple days during the weekly schedule by checking the boxes for the required days. The 'All', 'Weekdays' and 'Weekend' buttons provide a quick method of selecting days.

To set the time at which the switch over is to take place, select the appropriate hours (hh) and minutes (mm) from the drop down boxes. Finally, using the 'Switch Sign To' dropdown, select the state to switch the sign to.
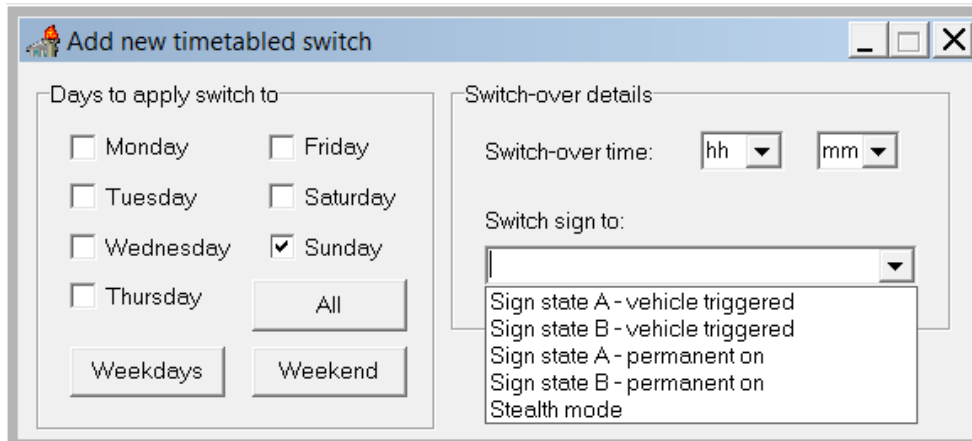
The sign states equate to:

School Zone Signs

       State A = Speed

       State B = School

Dual Speed Signs

       State A = Higher Speed

       State B = Lower Speed

Dual Arrow Signs

       State A = Right Arrow

       State B = Left Arrow

The trigger speed values for Sign State A/B are set by following the instructions in Section 6.11 below.

6.6 Removing a Switch-Over from a Schedule

To remove a switch-over from a schedule simply click on its entry on the schedule table to highlight it in blue as shown below and click 'Delete Switch'.
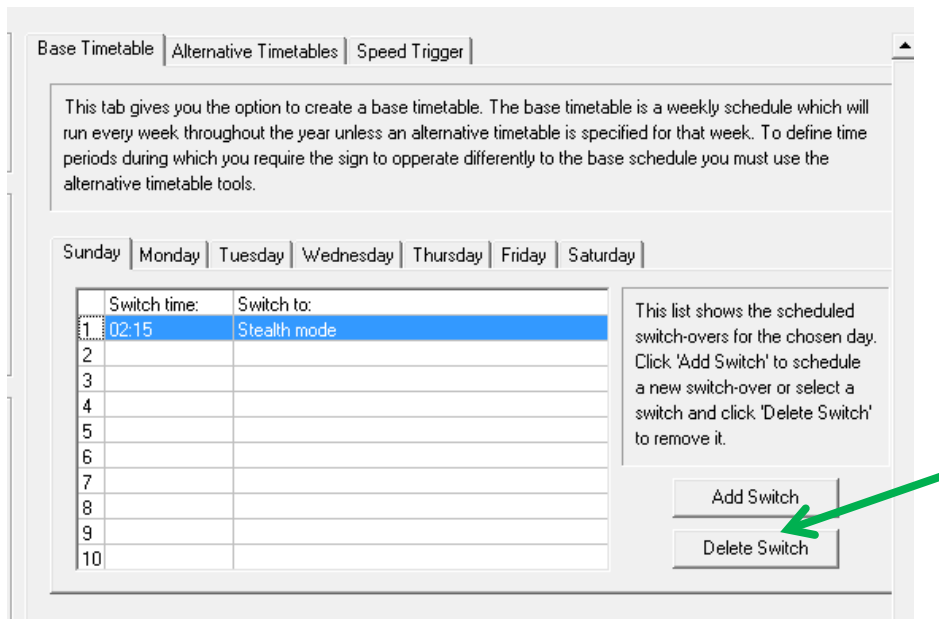
6.7 Creating an Alternative Timetable

When an alternative to the weekly base timetable is required, an 'Alternative Timetable' period can be defined. To create one, select the Alternative Timetables tab within the main application window. This tab will present the list of currently defined timetables.
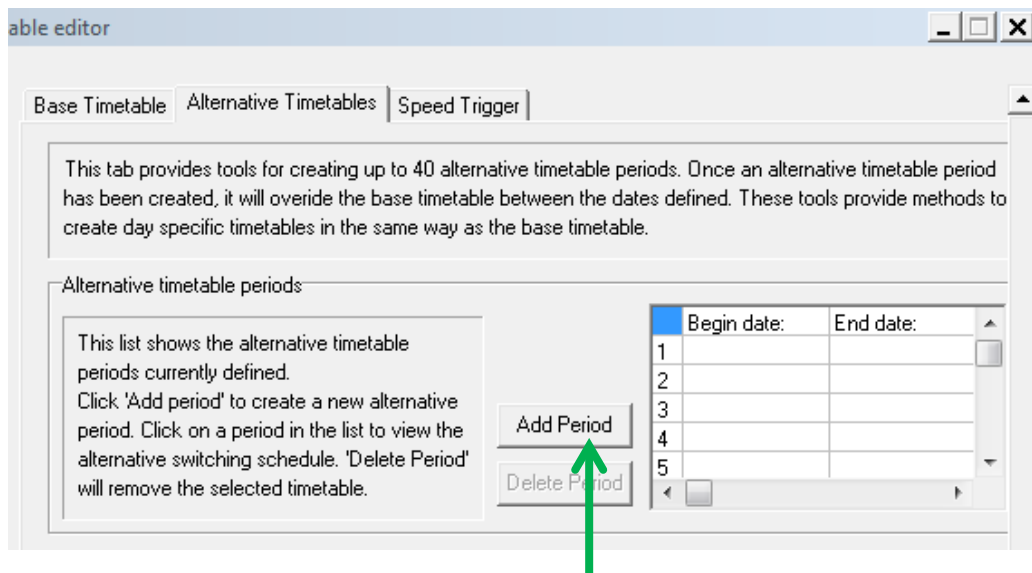
6.8 Adding an Alternative Schedule Period

To define a new period in which to enable an alternative schedule, first click Add Period as indicated by the arrow above. This will present the window shown below. A beginning and an end date can be selected using the drop down calendars provided.
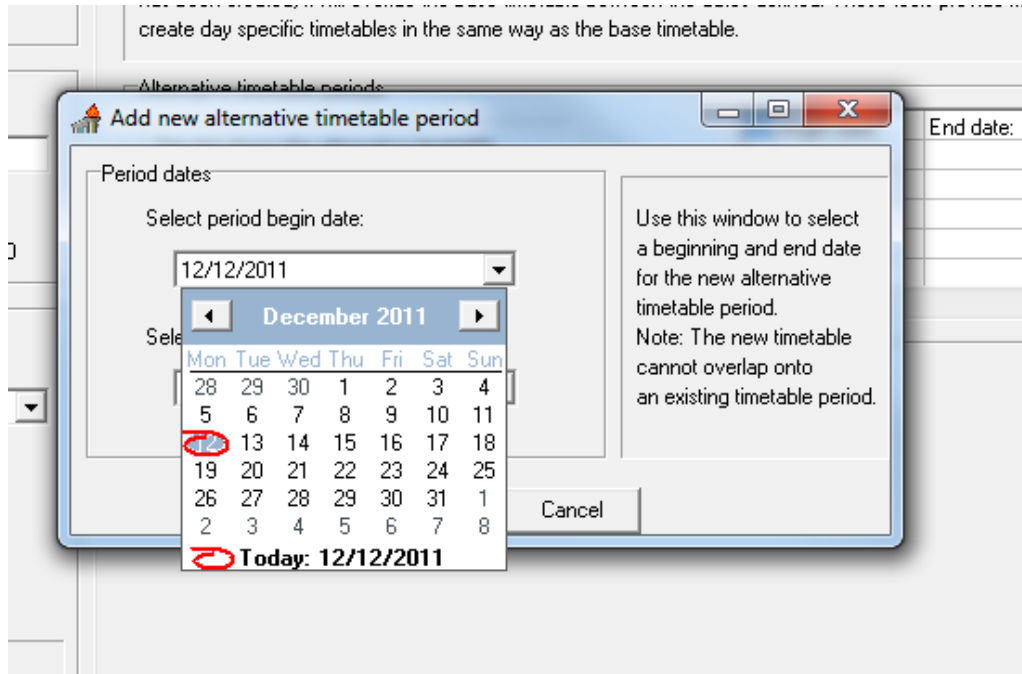
Click Add Period to add the new dates to the list.
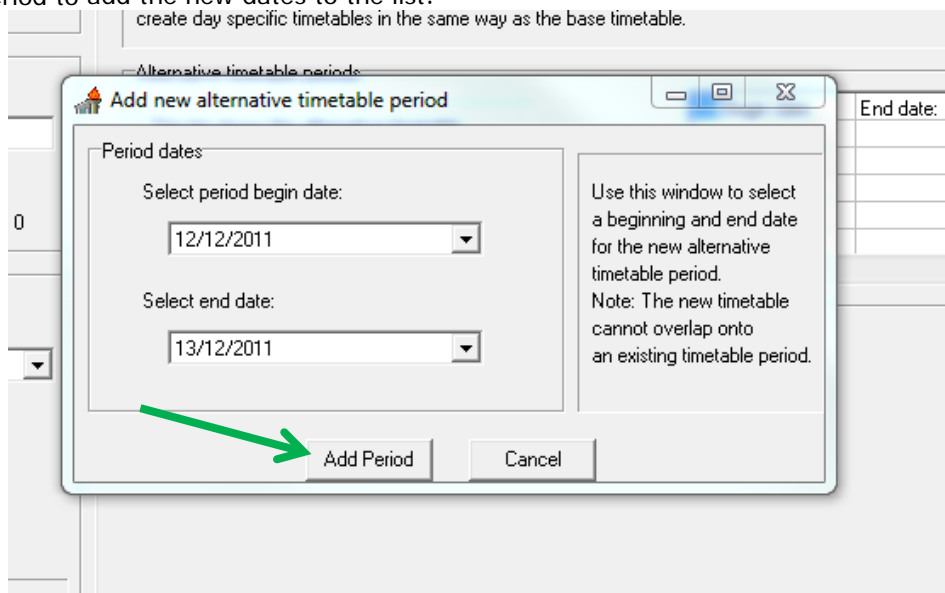
NOTE: A newly defined period may not overlap an already defined period. If the dates provided coincide with another alternative period then a warning will be given and different dates must be selected.

6.9 Creating an Alternative Schedule

Once the dates for an alternative period have been defined, the period will appear in the alternative period's table. To define the daily switchovers for the alternative period, click on its entry in the list. This will display the schedule for that period in a new schedule table as shown below. Browsing this schedule as well as adding and deleting switchovers can be performed in exactly the same way as for the base timetable.

NOTE: Alternative timetables can also be used to define periods where no switching is required. Simply leaving an alternative timetable without any switchovers defined will instruct the VATCS to remain in its default state for each day defined by the alternative period.
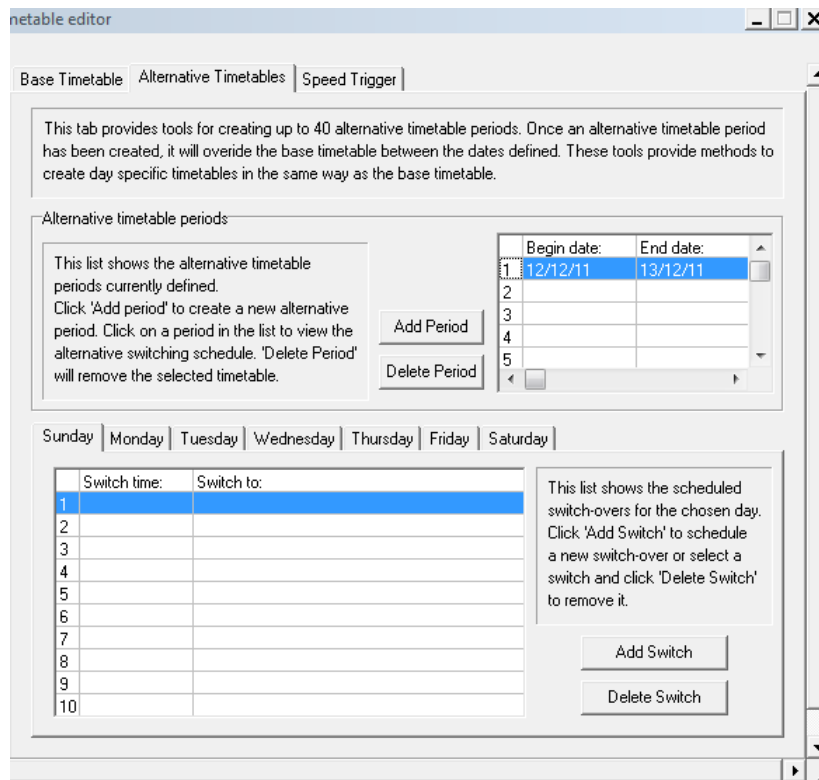
6.10 Removing an Alternative Schedule Period

To remove an alternative schedule period from the list, click on its entry in the period list and click Delete Switch.

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6.11 Custom Setting Alternate Trigger Speeds

A second set of activation trigger points can be applied if required, for example in school zones where a lower speed limit is required to be enforced at peak times of the day.

To set the primary and secondary speed triggers, select the Speed Trigger tab as shown in the screenshot below and then select each individual speed parameter by clicking on the drop downs as shown.
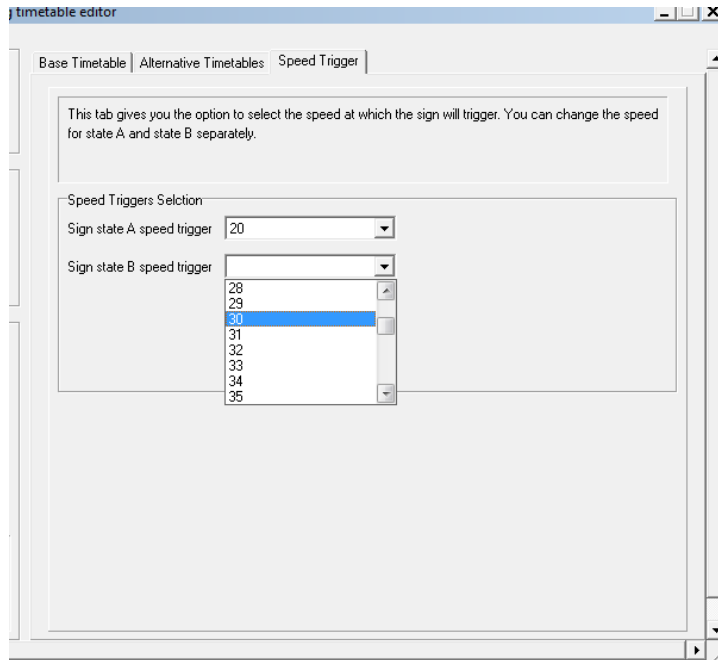
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7.0 Cyclist Ahead Sign Setup and Operation

The 'Cyclist Ahead' variant of the VATCS is designed to detect a cyclist using an induction road loop system and after a user set time delay, illuminate the sign and flashing Beacons.

These instructions are designed to enable a suitably qualified person to make the physical connection to the sign from the road loop and program the sign using the bespoke software system.

The settings in the sign are changed using a suitably configured PC/Laptop device with Bluetooth capability. Instructions for setting up the device are shown in Section 7.2 of this handbook.

7.1 Installation

Open the sign and ensure that it is electrically isolated by pulling the fuse barrels as shown:

This is a representative image only and the number/labeling of fuse may differ from those shown

Connect the two wires from the Loop Controller to screw down input terminals CH1 and GND
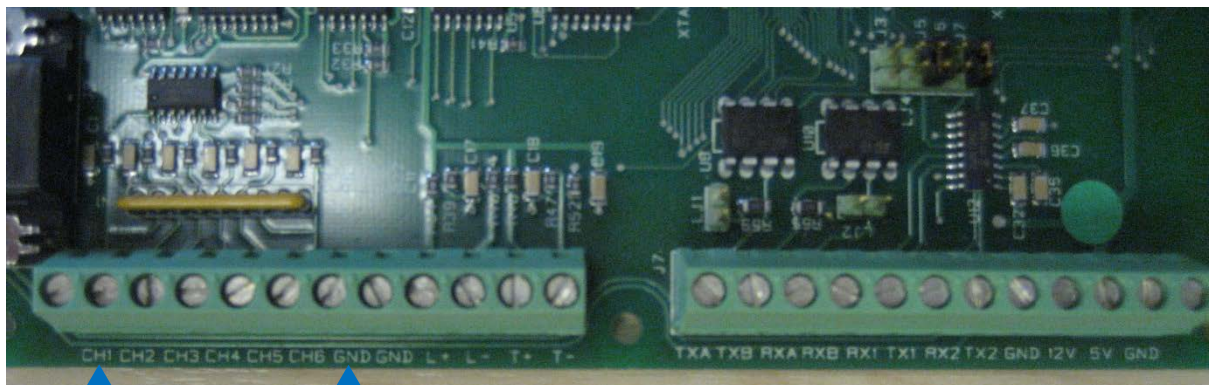
The DIP swiches, located on the main control PCB should then be set to Channel 1 as shown:
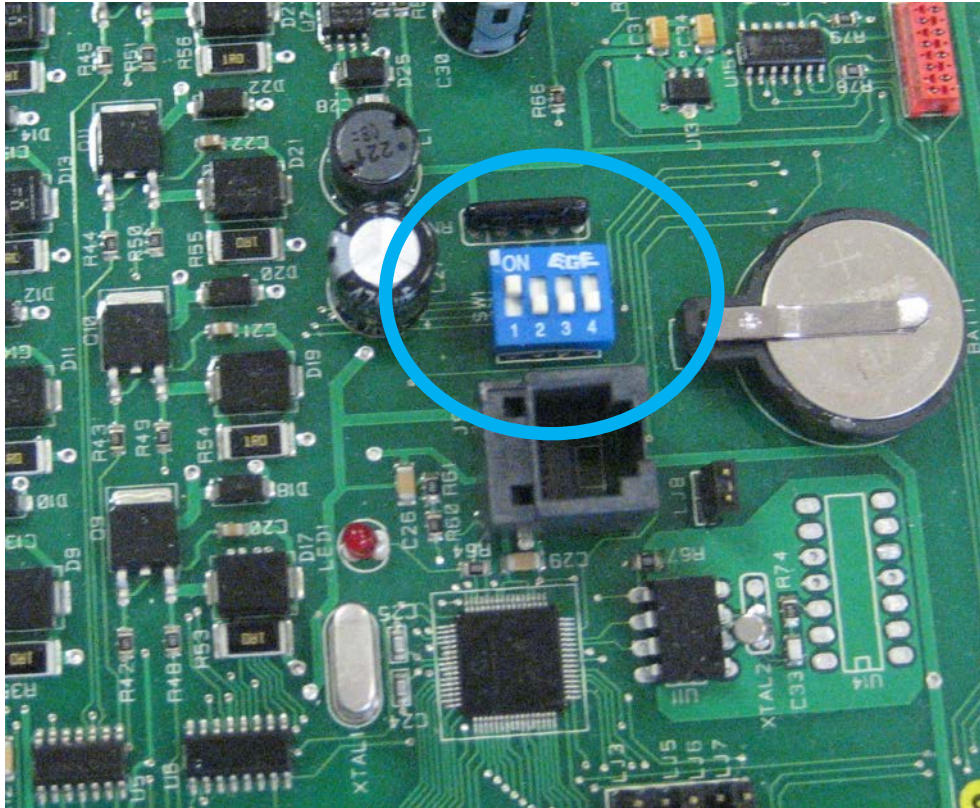
Close the fuse barrels and secure the sign door.

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7.1 Software Installation and Setup

Open the file Bikesigninstal.zip and unzip the contents. Double click on the setup.exe file and select run when the dialog box appears.

This will launch the Sign Configuration Setup Wizard:
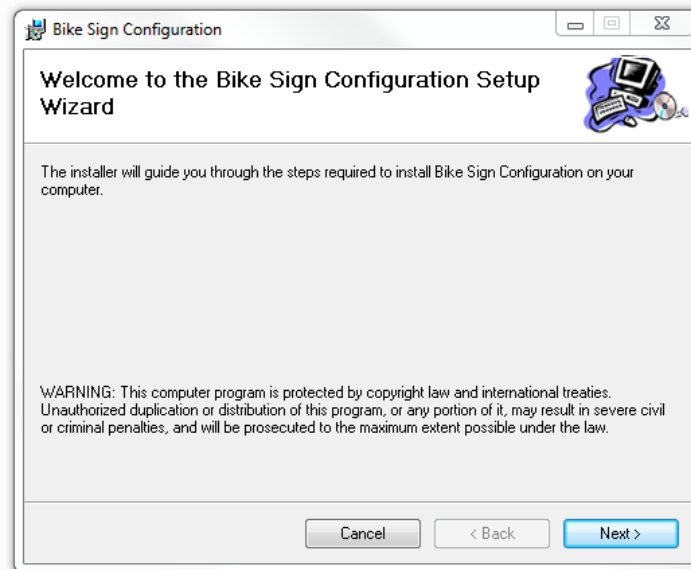
Click on the next button to launch the Wizard:
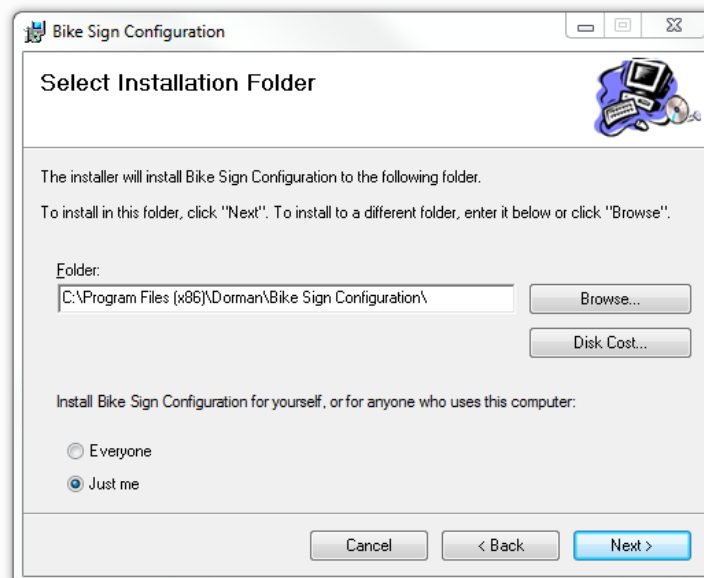
Select which folder you would like the configuration software to be installed in and click Next. If you would like to install the system in a place other than the default folder which is shown by the Wizard, click on Browse and search for the folder you require.

The radio buttons allow you to specify access rights to the system.

Selecting Disk Cost will bring up a list of drives on your computer and how much space is available before and after installation.

Click Next and then on the confimation dialog box which follows clicking next will begin the installation. Accept any requests for the program to access your computer and the select Close to exit the set up:
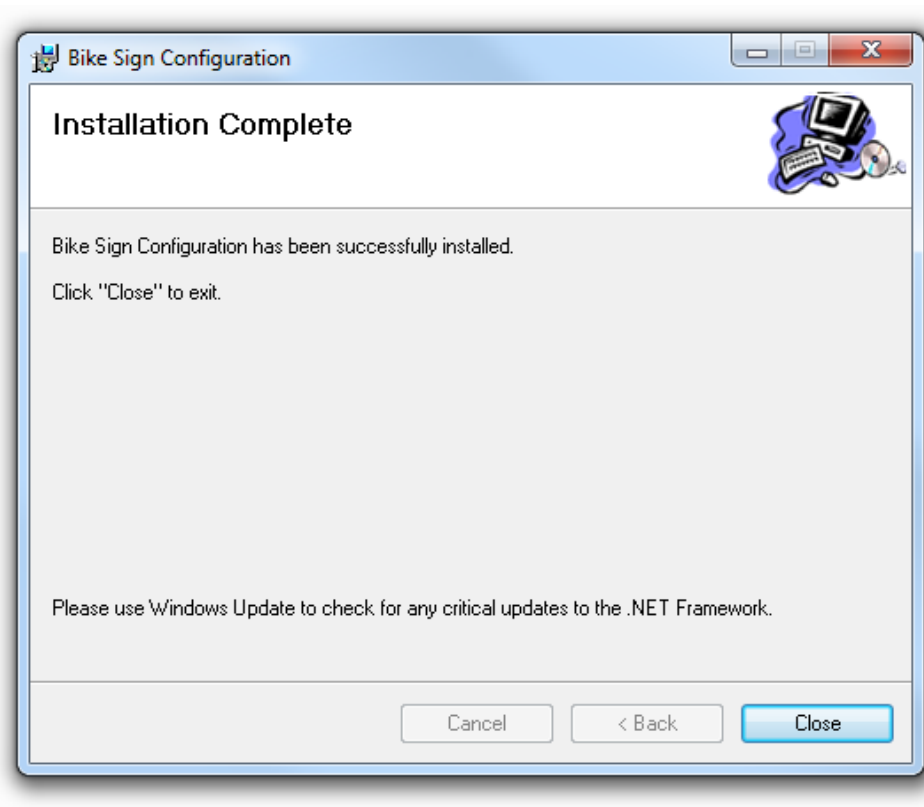
Once the program has successfully installed, connect to the sign via BlueTooth.

Click the Start button and select the Bike Sign Config Program:
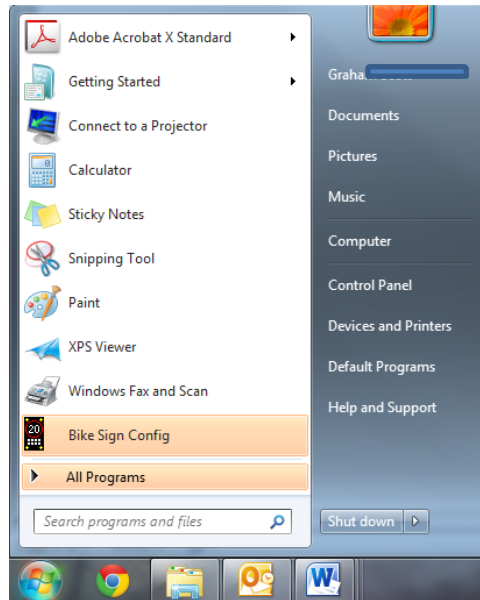
The following Dialog box will appear:

:
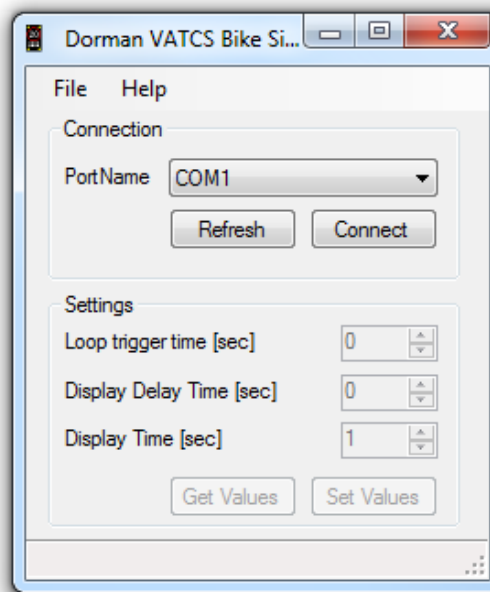
Select which Port Name you are using for your Bluetooth device using the PortName dropdown box and if prompted enter the pairing code **0000**

Using the up/down buttons select the parameters you require the sign to operate with and then click on the Set Values button. The parameters are then sent to the sign over the BlueTooth link. If there is a need to interrogate the parameters set in the sign, select Get Values and the current settings are displayed.

Once the operating parameters are set, close down the wireless connection and the sign will now be in operational mode.

8.0 Repair & Maintenance

It is recommended that routine maintenance is carried out at six monthly intervals as detailed below. This period may need adjusting depending on the conditions of use and should be revised after each maintenance visit.

8.1 Visual Check

Visually check the enclosure and screen, including the case seal for damage. Repair and replace as necessary. Check the cabling to the enclosure is secure and undamaged. Repair or replace as necessary.

8.2 Enclosure Cleaning

Clean the enclosure and front screen with a cloth with mild detergent solution. Abrasive materials or solvent based cleaners should never be used.

8.3 First Line LRU Maintenance.

The VATCS family series have no field maintainable components and have been modularly designed so that should any fault occur with the sign, the trained client maintainer may replace/remove the faulty LRU for return and repair.

The VATCS series of signs is made up of the following LRUs:

Si-3 Radar*
VATCS Controller Card*
VATCS PSU
VATCS Display Modules (display specific)
SS6 Charge controller
80W Solar Panel
12V 20amphr battery
Optional Float Charger
Bluetooth Dongle*

*These are specifically programmed by Unipart Dorman for use in VATCS signs. Off the Shelf items will not work and may cause unrecoverable damage to the equipment

It is recommended the client maintains a spares holding of LRUs commensurate with the quantity and types of VATCS model deployed to ensure minimum downtime of any VATCS due to failure. It is also recommended that the client maintainers are trained in the operation and maintenance of the VATCS to ensure a long and trouble free life.

Note: All failures due to manufacturer defects will be replaced or repaired at no cost to client during warranty period. Full warranty details are available on request.

The VATCS have no field maintainable content. However, a client trained maintainer may quickly diagnose the fault and replace the modular item causing it.

8.4 Replacing LRUs

After observing all normal safety precautions and considering any traffic management requirements, access to the inside of the sign should be made from a stable working platform.

The sign interior should be examined for any signs of water ingress or excess condensation and the enclosure door seal should be examined for integrity. Any evidence of water accumulation should be investigated and remedial action taken.

Before any work is carried out on the sign which does not require the sign to be powered up, the sign should be electrically isolated by withdrawing the fuse barrels located on the DIN rail as shown below.
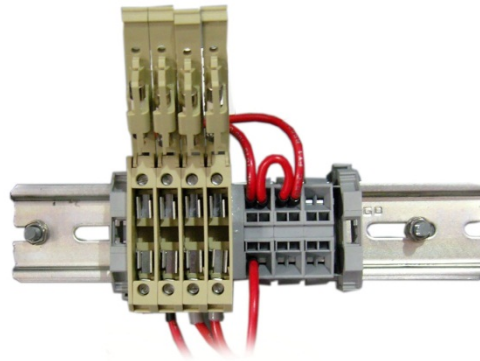
8.5 Replacing the Control Board
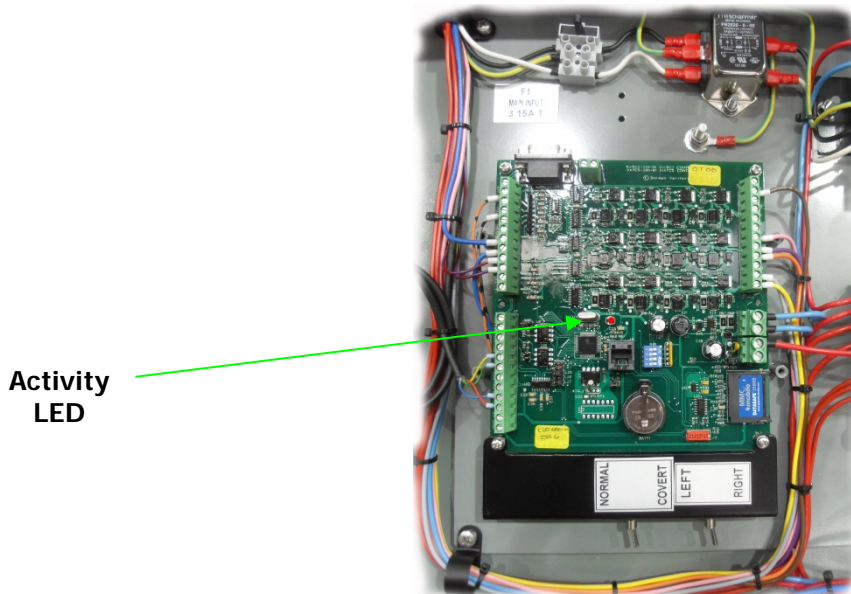
Activity LED

After locating the Control Board, all cables linking it to the rest of the sign should have their positions carefully noted and then be disconnected by undoing the terminal screws securing the cables to the board. (Please note that the picture above is a representation of a control board installation and colours/positions of cables may differ)

Remove the four cross head screws in each corner of the board and lift it out. The switch housing should be supported during the board removal and the cables clearly marked before disconnection and removal from the main board.

If an MMC Card as shown by the red box below is fitted to the board, it will need to be transferred to the replacement board during fitment. Also the Bluetooth dongle as shown by the green box below will need to be transferred between the old and new board.
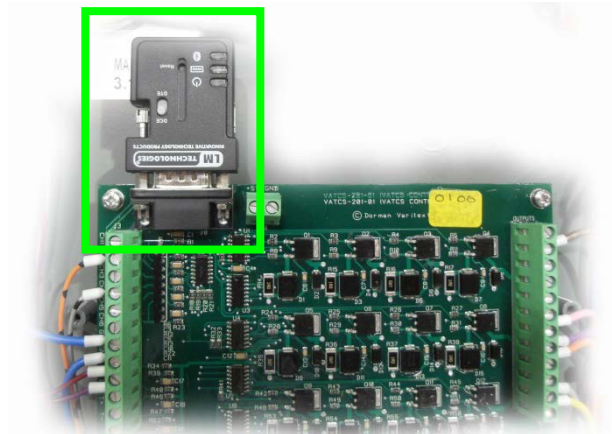
Fitment is a reversal of removal. Restore power by refitting the fuse barrels, and ensure the red indicator LED on the control board flashes approximately once every second.

8.6 Replacing the MVD (Decatur Radar)

After Locating the MVD, first trace the cable run around the sign, and then disconnect it from the sign at the disconnection break seen below removing cable ties as required.
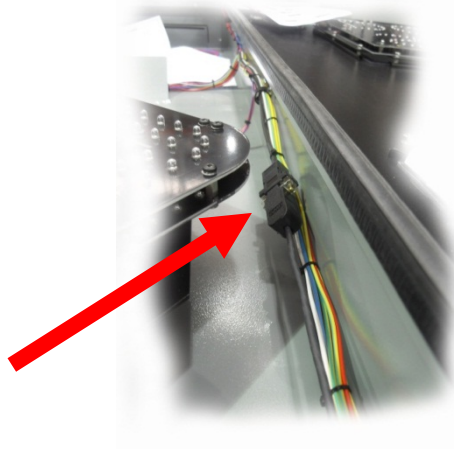
The MVD head can then be removed from the support bracket using a 3/16″ Allen Key.
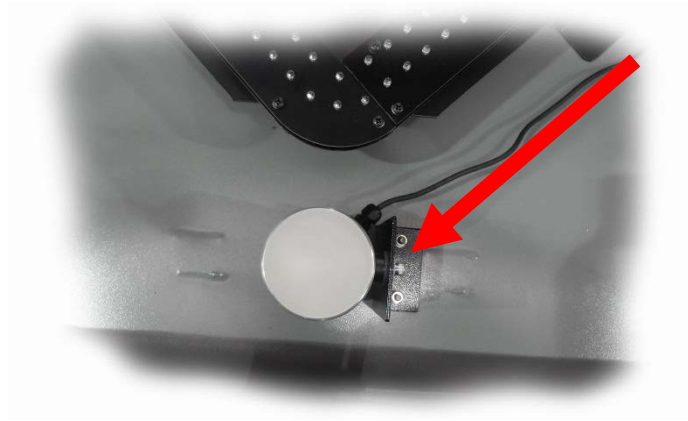
Fitment is a reversal of removal. It should be noted that if the insulating washers indicated in the pictures below are not fitted, and an earth path is created, the MVD will not function and may suffer irreparable damage.

Insulating washers must be refitted
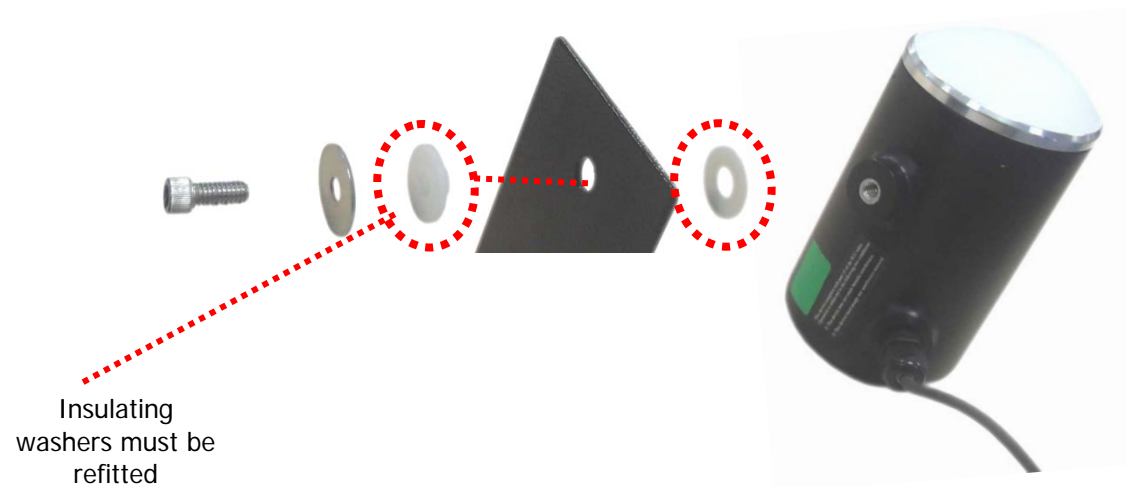
The cable should be tidied and cable ties fitted as required.

Restore power by refitting the fuse barrels, and ensure the red indicator LED on the control board is illuminated.

The MVD is specifically matched to Dorman applications and as such an 'off the shelf' unit will not function correctly.

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8.6.1 Replacing the MVD (Houston Radar)

The Houston Radar unit does not have the convex end cap and is mounted in the support bracket using the two cross head screws. Otherwise replacement is the same procedure as the Decatur Radar with the exception of the requirement to fit insulating washers.

8.7 Replacing the LED Arrays

There are a variety of displays fitted in many variants of sign but essentially the arrays are secured using simple nut and bolt fasteners. Note the position of any washers fitted and ensure they are replaced in the same order.

Electrical connection is achieved by using screw down terminals as shown below. Please note cable identification varies between models and to ease reconnection Unipart Dorman strongly advise the marking of each cable position prior to disconnecting.
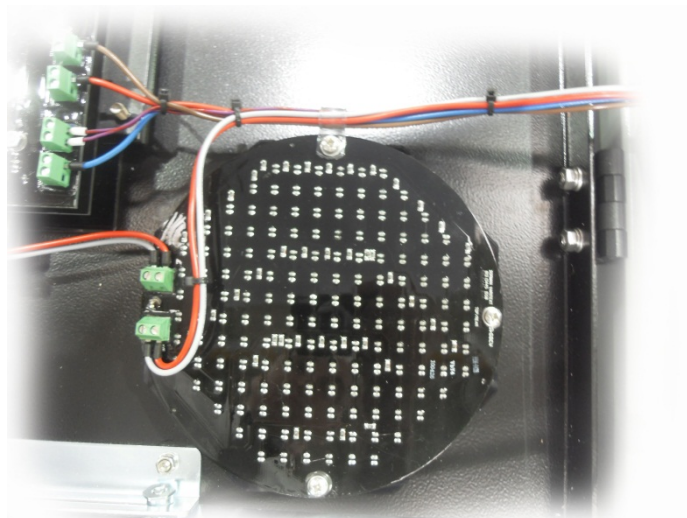
Beacon Array shown for illustrative purposes only

8.8 Fuse ratings and position

Fuse F1

This fuse protects the equipment against mains supply voltage anomalies and is a slow blow/Time Delay fuse rated at T3.15A

Fuse F2
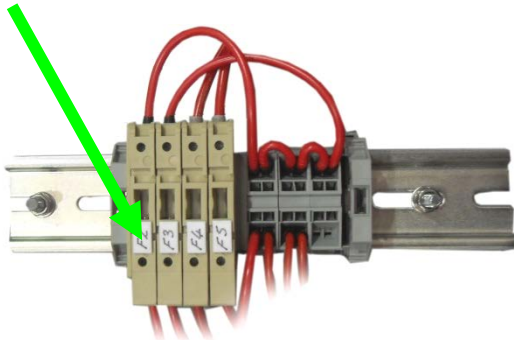
This fuse protects the display against voltage anomalies and is a slow blow/Time Delay fuse rated at T5.0A

Fuse F3
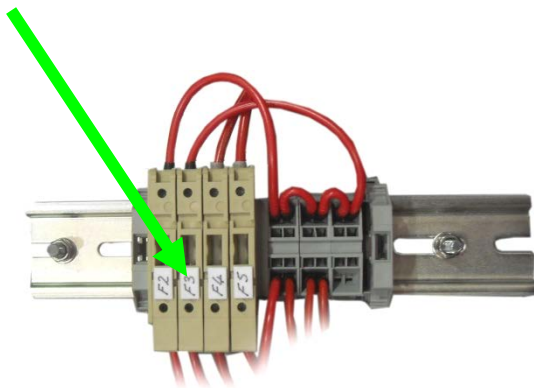
This fuse protects the Main Control Board and the MVD against voltage anomalies and is slow blow/Time Delay fuse rated at T5.0A

Fuse F4
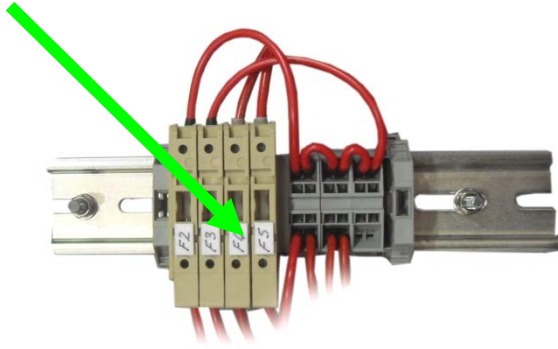
This fuse protects Battery 1 & 2 against voltage anomalies and is a slow blow/Time Delay fuse rated at T10.0A
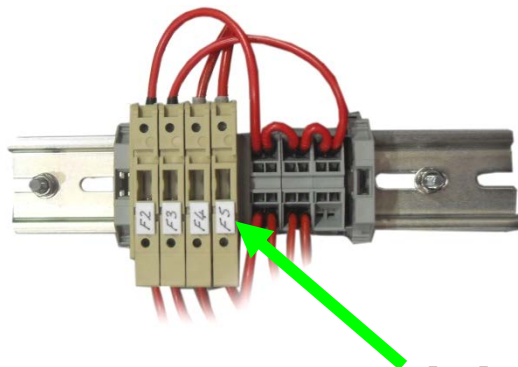
Fuse F5

This fuse protects Battery 3 & 4 against voltage anomalies and is a slow blow/Time Delay fuse rated at T10.0A
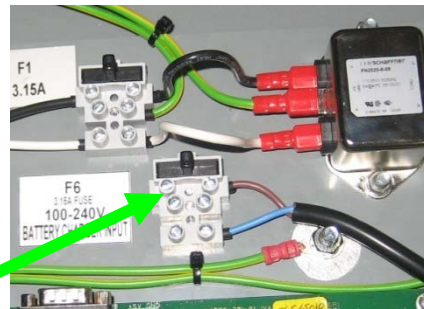
Fuse F6

This fuse protects the Float Charger (where fitted) against voltage anomalies and is a slow blow/Time Delay fuse rated at T3.15A

9.0 PDA Software Application Troubleshooting

Here are some answers to some common problems that may be encountered during use of the Communicator software.

<u>After Selecting the Bluetooth Connection to the Sign, the Software Does Not Reappear On the Display</u>

If this occurs, the PDA does not have Bluetooth turned on. Please see the section "Establishing a Connection to the Sign" on how to do this.

<u>Keyboard Icon Does Not Appear On Software</u>

When trying to enter a name for the log file, the keyboard icon has not appeared in the bottom right hand corner of the screen.

To fix this, go to START→SETTINGS and select the SYSTEM tab. Click the MEMORY icon and then select the RUNNING PROGRAMS tab. In the list you should see "Unipart Dorman Sign", click this and then click the ACTIVATE button. The keyboard will now be available in the software

<u>Sign Remains Connected to the PDA after Closing the Software</u>

When you have exited the software, the dongle connection light remains on, meaning that the software has not disconnected from the sign. The problem here is that the software is still running in the PDA memory, usually because you exited the software via the X button rather than the EXIT button.

To fix this go to START→SETTINGS and select the SYSTEM tab. Click the MEMORY icon and then select the RUNNING PROGRAMS tab. In the list you should see one or more "Unipart Dorman Sign" entries. This is the VATCS Communicator software. Click each one of these entries and click the STOP button to remove them from memory. Next turn the Bluetooth on and then off (See the "Establishing a Connection to the Sign" section).

<u>The Bluetooth Device Selection Screen Does Not Appear When You Click the CONNECT Button.</u>

The PDA by default is set to display a device selection screen as it is searching for Bluetooth devices. However, the setting may have been turned off which would prevent this screen from appearing when you clicked CONNECT.

To fix this, follow the instructions for determining the outbound communication port settings found in the section "Establishing a Connection to the Sign". On the screen displaying these settings, check the box stating "Default Device for outgoing serial connections..." This causes the device selection screen to be displayed.

<u>Other Problems</u>
If you have any other problems with the software, resetting the PDA will get the VATCS software back into its original state. To do this, use the PDA stylus to press and hold the small button at the side of the PDA. The PDA should take a few moments to reset.

10.0 Troubleshooting Flow Charts

The charts situated at the very end of this handbook are not exhaustive but are designed to provide some guidance to fault finding. There are three separate flow charts, a main fault finding guide and individual diagrams to assist in fault finding on the power supply systems.

11.0 Annual Maintenance

The following table lists the requirements of an annual maintenance programme:

Task	Remarks
Inspect the post, post mountings and the exterior of the sign for signs of tampering, security of attachment and surface finish damage	Ensure Adequate Traffic Management arrangements are in place before starting work. The post and mountings are not supplied or installed by the Contractor therefore any responsibility for installation, operation and maintenance remains with the customer
Using the original sighting information from the Site Acceptance Test, ensure the sign is correctly aligned in both azimuth and elevation and also is at the correct height (This should be a minimum of 2.4m from the bottom of the sign to ground level). Ensure that since sign commissioning, no structural or natural obstructions to the signs viewability to oncoming drivers, and/or the ability of the speed measuring device to detect vehicles have appeared.	Commonly overhanging trees/foliage, sign hoardings etc.
Test the post electrical isolator and all earth/grounding connections for electrical integrity and correct operation. Leave the sign isolated from the mains supply during the remainder of the maintenance procedure. If the sign cannot be electrically isolated at this point any further maintenance should be abandoned until such time as the isolator is repaired.	The isolator manufacturer's instructions should be referred to for the correct operation and test methods. The isolator is not supplied or installed by the Contractor, therefore any responsibility for installation, operation and maintenance remains with the Customer
Clean the sign face using a mild soap solution or approved foam cleaner. **Use of harsh abrasives will cause irreparable damage to the sign front**	Ensure any soap residue is removed after cleaning
Confirm all three locking devices are correctly engaged prior to opening the sign and the edge of the door has not suffered any distortion or signs of attempted unlawful entry	
Unlock and open the sign and inspect the door seals for completeness, correct fitment and signs of wear or damage	
Inspect the door stay assembly where fitted	

for security of attachment and correct operation	
Vacuum clean the interior of the sign	Care should be taken not to damage any components or circuits etc with the nozzle.
Inspect the sign interior including cable entry gland nuts/bungs for signs of moisture ingress. This may include presence of water/ heavy condensation, water staining on components and surface finish, or signs of fungal growth	Any sign of excessive moisture ingress MUST be investigated and remedial work carried out. Consider photographing the area affected by moisture ingress to generate a comparison record for future visits and copying the photographs to Technical Support at Unipart Rail Ltd – Dorman Varitext for comment
Inspect each Fuse and ensure that it is of the correct rating and blow rate as shown in the O&M Manual	
Ensure all cable terminations, cable support fittings; nuts, bolts and fixing devices are secured correctly and in good condition	
Ensure all electrical earthing and bonding devices are secured correctly and in good condition.	
Restore electrical power to the sign.	
Check the Light Detector for correct operation by covering the light sensor and ensuring the sign visibly dims to approximately half brightness within 60 seconds. Then assumes the original brilliance within 60 seconds of removing the cover. (This operation can only be carried out during the hours of daylight).	
Check the speed measuring device for security of attachment and correct alignment Ensure that the device is working correctly by observing the oncoming traffic and sign activation	
Operate the legend changeover switch and ensure that the display changes.	
Close the sign making sure no distortion of the door seal takes place and ensure all three locking devices are correctly engaged.	

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12.0 GLOSSARY OF TERMS

AC   **Alternating Current**

ADT   **Average Daily Traffic**

Amp/Hr   **Amperes per Hour**

CD   **Compact Disc**

DC   **Direct Current**

Hz   **Hertz**

IP (65)   **Ingress Protection Rating**

KPH   **Kilometres per Hour**

LRU   **Line Replaceable Unit**

M   **Metre**

MMC/SD   **Memory Card Variants**

MPH   **Miles per Hour**

MVD   **Moving Vehicle Detector**

PDA   **Personal Digital Assistant**

PSU   **Power Supply Unit**

RF   **Radio Frequency**

RTC   **Real Time Clock**

V   **Volt**

VATCS   **Vehicle Activated Traffic Calming Sign**

W   **Watt**

MAIN FAULT FINDING

```
┌─────────────────────────────────────┐
│  Speeding vehicles do not trigger sign │
└─────────────────────────────────────┘
                    │
                    ▼
          ╱╲
         ╱   ╲                    No        ╱╲                    ┌──────────────────────────┐
        ╱ Is the ╲──────────────────────▶ ╱    ╲ ──────────────▶ │ Refer to the correct power supply │
        ╲ red LED on ╱                    ╲ Is the ╱               │ fault finding chart for assistance │
        ╱ the front of the                ╲ sign  ╱               └──────────────────────────┘
         ╲ sign  lit ? ╱                    ╲ powered ╱
          ╲╱                                  ╲╱
           │
          Yes
           │
           ▼
          ╱╲
         ╱   ╲                    No
        ╱ Is the red ╲──────────────────────────────────────────────────────────────▶
        ╲ activity    ╱
        ╱ LED flashing on
         ╲ the main PCB? ╱
          ╲╱
           │
          Yes
           │
           ▼
          ╱╲                      Yes                            ┌──────────────────────────┐
         ╱   ╲──────────────────────────────────────────────▶   │ Set the selector Switch to  │
        ╱ Is the sign ╲                                          │ 'Normal'                     │
        ╲ set in Covert ╱                                        └──────────────────────────┘
        ╱ Mode? ╱
          ╲╱
           │
          No
           │
           ▼
          ╱╲                      No                             ┌──────────────────────────┐
         ╱   ╲──────────────────────────────────────────────▶   │ Refer to relevant section of this │
        ╱ Are the spped ╲                                        │ handbook tfor checking and │
        ╲ settings and any ╱                                     └──────────────────────────┘
        ╱ timetable options
          ╲╱
           │
          Yes
           │
           ▼
          ╱╲                      No                             ┌──────────────────────────┐
         ╱   ╲──────────────────────────────────────────────▶   │ Clear any obstructions     │
        ╱ Does the MVD have ╲                                    └──────────────────────────┘
        ╲ an unobscured view ╱
        ╱ of the road?? ╱
          ╲╱
           │
          Yes
           │
           ▼
┌──────────────┐                          ╭──────────────────╮
│  Replace MVD │──────────────────────▶   │  End of Process  │
└──────────────┘                          ╰──────────────────╯
```

DC POWER CHECKS

Is the panel intact, aligned correctly, clean and connected? —No→ Remedy any problems, ensure there are no obstructions to the panel achieving a clear view of the sky.

Yes ↓

Is the green LED lit on the Solar Controller? (Daytime only) —No→ **Is the red LED lit on the Solar Controller??** —Yes→ The charging system iis in 'Hibernation' See Note 2

Yes ↓   No ↓ (from red LED) → Replace Solar Controller

Note 1
Ensure Replacement fuses are of the correct rating and fail speed

Is the Solar Controller delivering 12V DC?

Yes ↓

Is the red activity LED flashing on the main PCB? —No→ **Are all the DIN Rail fuses intact?** —Yes→ If the fuses are intact and the wiring checks out OK between the Controller and PCB, replace the Controller.

Yes ↓   No ↓ (from DIN Rail fuses) → Replace Fuses (See Note 1)

Return to main Fault Diagnosis Chart

No

Note 2:
During periods when the battery use is high or the charging capability is compromised by prevailing conditions, the Solar Controller will place the sign into a state of 'Hibernation' until the battery capacity has returned to >11.5V. There are a number of measures that can combat this effect and The Unipart Dorman Sales Team will be happy to provide advice if required.

AC FAULT FINDING

Is there an AC supply at the Post? — **No** → Call Utility Provider

Yes ↓

Is Fuse F1 intact? — **No** → Replace Fuse (See Note 1) → End of Process

Yes ↓

Is PSU delivering — **No** → Replace PSU → End of Process

↓

Are all the DIN Rail — **No** → Replace Fuses (See Note 1) → End of Process

Yes ↓

Is the red activity LED flashing on the main PCB? — **Yes** → End of Process

No ↓

Is there 12VDC at the main control PCB input — **No** → Check wiring from PSU → End of Process

Yes ↓

Replace PCB

Note 1
Ensure Replacement fuses are of the correct rating and fail speed

End of Process

Contact Us