DF15 – Vehicle Activated Sign

**Customer Handbook
Model References:**

DF15 YU (Yellow 'Your Speed' Fascia – U Channel Fixing)
DF15 YGU (Yellow/Green 'Your Speed' Fascia – U Channel Fixing)
DF15 WU (White 'Your Speed' Fascia – U Channel Fixing)

DF15 YU (Yellow 'Your Speed' Fascia – Z Bracket Fixing)
DF15 YGU (Yellow/Green 'Your Speed' Fascia– Z Bracket Fixing)
DF15 WU (White 'Your Speed' Fascia – Z Bracket Fixing)

UNIPART DORMAN

Introduction

1.1 Pre-requisites

If you are installing DF15 hardware you must perform the following tasks:

Choose an appropriate installation location.

Manage your own personal safety and safety of other personnel and the public.

Assemble the required equipment and organize/implement Traffic Management arrangements.

Have experience installing electrical equipment at height.

1.2 Important Safety Information

Please review the following information before installation.

Warnings

READ ALL INSTRUCTIONS BEFORE USE AND SAVE THIS MANUAL FOR FUTURE REFERENCE

DF15 units must be installed and adjusted in accordance with the installation instructions contained in this Handbook

Use the DF15 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 during with the equipment and should never be considered as a substitute for your judgment and experience.

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 DF15 sign.

Operate any AC isolation equipment fitted to support structures.

Open the white fuse barrels located on the DIN Rail illustrated in section 2.3.1 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.

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 display face.

An accidental short circuit may instantly heat conductive jewelry, tools, etc to skin-burning temperatures.

Keep tools, jewelry, 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.

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.

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

Use appropriately rated mounting hardware.

1.3 Scope of this Document

This documentation provides the following information for DF15

Setup and Operation

Troubleshooting

Installation of DF15 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 DF15 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

DF15 are electronic vehicle speed activated LED road side signs which are directly targeted, and proven to have an effect on road safety.

The sign provides a digital speed feedback display and user selectable 'Slow Down' or 'Slow Ice' warning legends coupled with flashing amber LED Beacons in each corner of the sign.

The sign is supplied with front fixed plate fascia with YOUR SPEED in black lettering on a choice of diamond grade reflective fluorescent yellow, yellow green or white backgrounds.

Unipart Dorman DF15 signs are available with a speed data logging analysis feature which 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.

A second set of activation trigger points can be applied in school zones where a lower speed limit is required to be enforced at peak times of the day. This allows active reinforcement of separate speed limits at user specified times.

Signs are supplied with either Solar only or dual AC/Solar plug and play compatibility to suit both urban and rural site applications.

The DF15 Sign is fully compliant with the FHWA Manual for Uniform Traffic Control Devices (MUTCD) 2009 Edition and meets the minimum requirements detailed in Section 2B.13 Speed Limit Sign (R2-1) Clause 20.

The DF15 can be configured to deliver a speed warning message that is in direct relation to how far the speed limit is being exceeded. E.g. 2mph above speed limit - display speed solidly,
5mph above limit - display speed solidly with flashing beacons, 10mph over limit - display Speed alternating with SLOW DOWN, 15mph over limit - display SLOW DOWN with flashing beacons.

1.5 Schematic Diagram

Shown overleaf is a schematic diagram which depicts the interfacing of the various components which go to make up a DF15. On solar only versions, the AC Supply, Post Isolator and AC to DC Converter are omitted; and correspondingly on AC Power versions the Solar Panel, Solar Controller and batteries are omitted.

An additional Float Charger which can charge the batteries using an external AC source may also be specified for areas of poor sunlight capture or very high traffic volumes. Please contact Unipart Dorman for more information.

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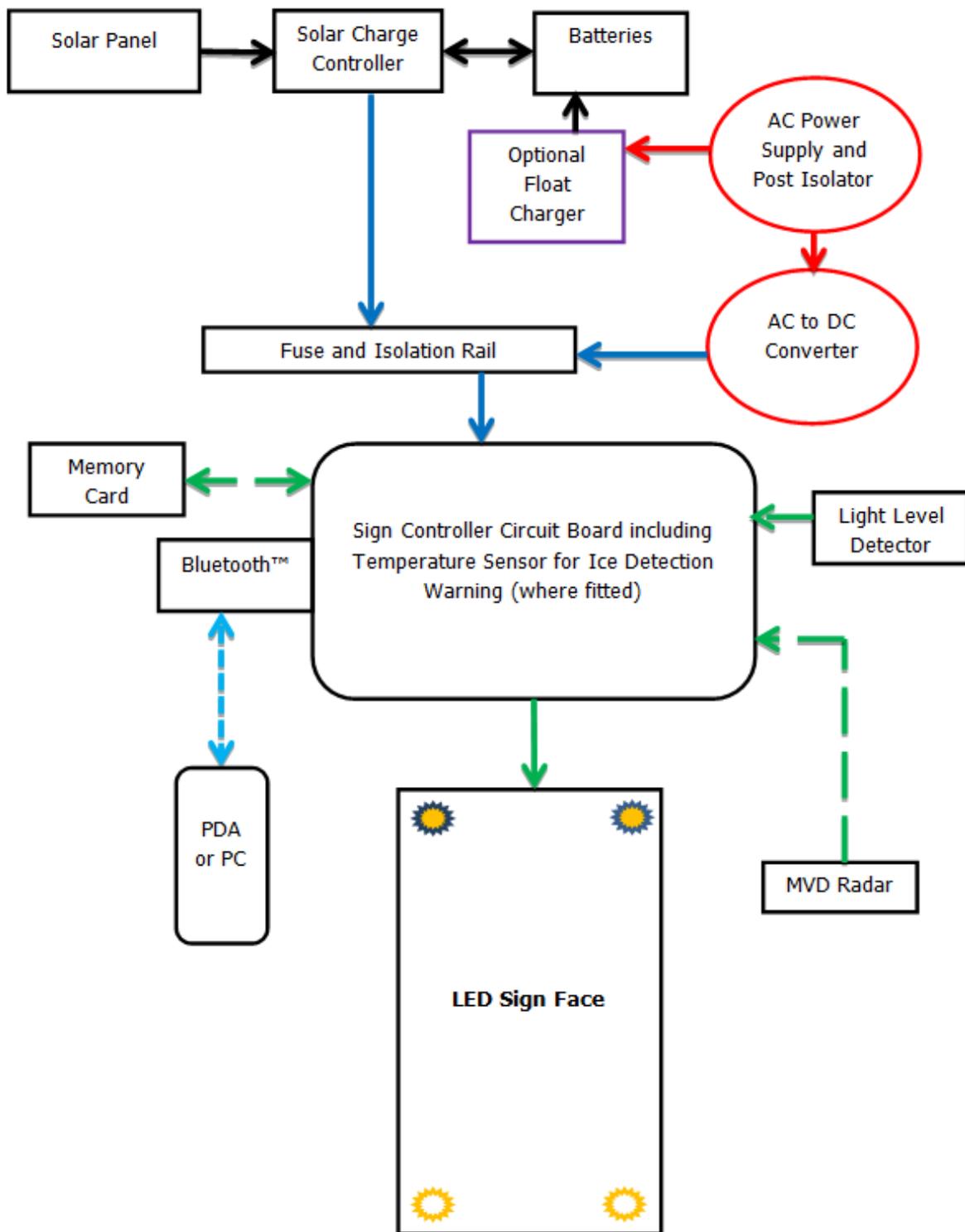
2. Installation

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 DF15

Mark a chalk line on the post at 7 ½ ft/2.28m from ground level (level with the road surface).
This will be the position for the bottom of the sign. For optimum alignment the sign display face should be pointing at the center point of the approach traffic lane at a range of between 300ft (92M) and 500 ft (150M) distance from the sign. In the case of a dual lane approach, use the dividing center line of both approach lanes. (The radar sensitivity may be adjusted to suit local conditions if required by following the instructions shown in section 5.8)

Failure to align the radar correctly may affect radar performance.

Signs are delivered with Signfix Channeling as the mounting hardware and are installed with ¾" / 19mm banding using SX0220 banding adaptors. Unipart Dorman recommends that dual bands should be used on the top and bottom mounting points to add extra strength. The sign can also be affixed using Signfix U brackets for ease of frequent dismantling and re-deployment of the DF15.

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, which should be consulted before installation commences.

2.2 Installing the Solar Panel

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 junction box.

The bracket is assembled using the instructions included in the bracket packaging.

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. >45° in winter.

The bottom cross member of the side of pole bracket should be mounted approximately 12" (305) mm 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.
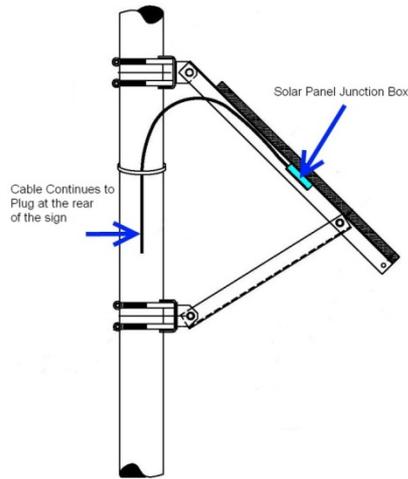
Typical Solar Panel Arrangement

2.3 Electrical Hook Up

All DF15 can be supplied as standard with either Solar only or Dual AC/DC (Solar) functionality,
allowing clients the flexibility to select an appropriate power source to suit each DF15 site location.

2.3.1 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:
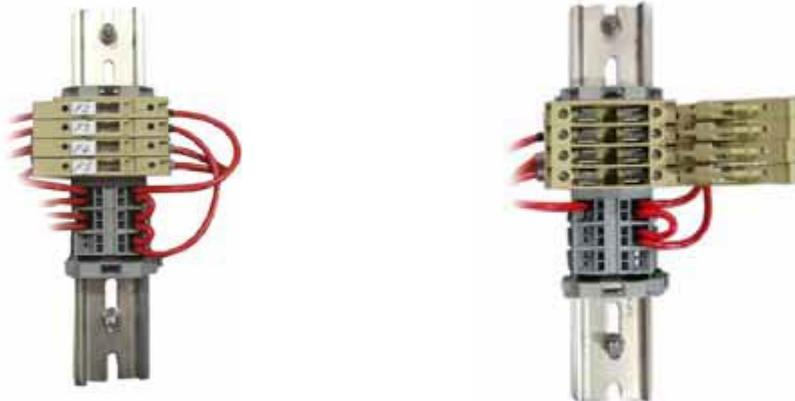
Physically clamp all 20 amp/hr 12v battery cells into position in the compartment provided internally within the bottom section of the DF15
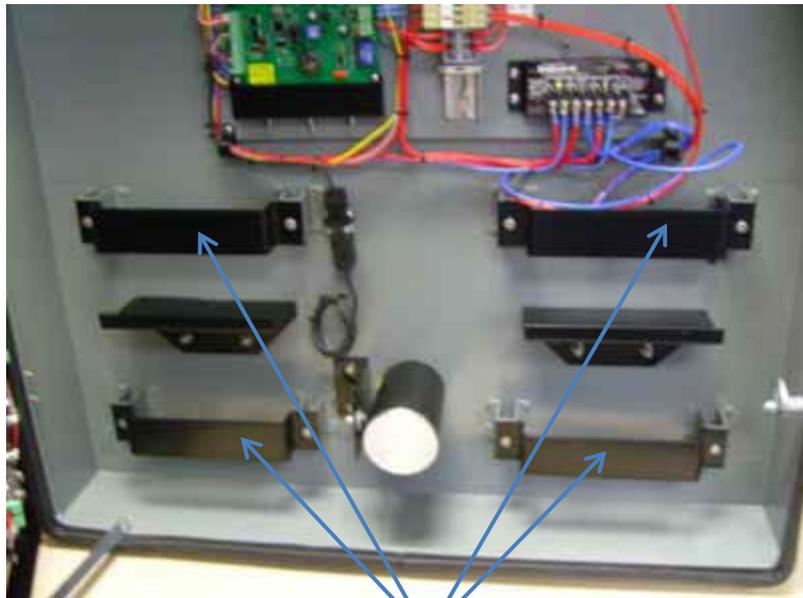
**Battery
Clamps**

WARNING

On Dual AC/Solar devices, if the sign is to be solar powered it is essential that the fuse in position F2 is removed

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.

The supplied lead connects at one end into the solar panel junction box and at the other to the rear of the sign via an IP65 plug/socket arrangement.

Open the junction box on the back of the solar panel by undoing the 4 retaining screws. Fit the ½″ / 13mm plastic cable gland, feed the cable through the gland and terminate to the screw terminal connections. Finally, hand tighten the gland to ensure weatherproofing.

Important Note:

 It is essential that the correct polarity of all connections is maintained to prevent possible damage to the system.

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 to ensure proper fitment which ensures the NEMA Standard 4/IP65 ingress rating. Ensure dust caps are fitted to all unused sockets

Note: Solar Only Signs are supplied with a blanking bung fitted in place of the upper AC Hookup point

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 installer should note that the red LED1 on the DF15 control card will flash to indicate that the system is being powered correctly.
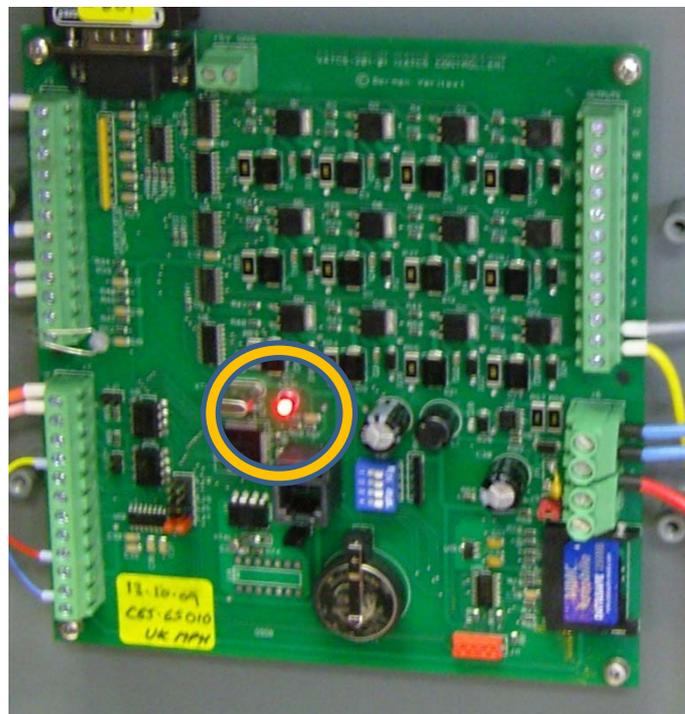
The installer should also at this point take note of the LED indicators on the SunSaver charge controller located within the sign: The green 'charging' LED will light whenever sunlight is available and indicates that the battery reservoir is being charged correctly. The green LED will extinguish at night.

The Red 'Load Disconnect' LED will light to indicate that the charge controller has automatically disconnected the DF15 where the battery charge is very low in order to prevent potential damage. The controller will automatically turn the DF15 back on once the battery charge has returned to acceptable levels Solar Power connection is now complete and the DF15 is ready for sign configuration parameters to be set and deployment. (See section 3)

2.3.2 AC Hook Up (Where supplied)

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

WARNING

If the sign is to be 110V AC powered it is essential that the fuse in position F3 is removed

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

Option 1

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

Or

Option 2

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

Important Note: The following items are to be conducted by an Approved Electrician

Option 1. Install a 3 core, 1.5mm PVC covered armoured flexible cable, terminated at one end into the NEMA Standard 4/IP65 Plug, and at the other connected to a fuse isolated external local AC 110V supply (5amp minimum).

Option 2. Fit an approved outdoor armoured flexible conduit (not supplied) between the sign conduit entry point and the fuse isolated external local (5amp minimum) AC 110V supply.

Install a 3 core, 1.5mm PVC covered flexible cable via the conduit between the external local (5 amp minimum) fuse isolated 110V AC supply and the internally labelled 110VAC F1 supply input fused screw terminal (it will be necessary to disconnect and stow the pre-connected cables leading from the 3 pin socket to the fuse block).

Strip back each core 6mm and connect the green earth core into the terminal marked ⏚ (the middle terminal), connect the black core to the live fused terminal and connect the white core into the neutral terminal. DF15 signs will operate from 100 -110V AC single phase supply. Internal Fuse rating is 3.15A and is of the Time Delay variety.

IT IS ESSENTIAL THAT ALL THE TERMINATIONS AND CONNECTIONS ARE FULLY INSULATED AND THAT NO CURRENT CARRYING CONDUCTOR IS LEFT EXPOSED

Follow the same instructions as per above to connect into the local external fuse isolated supply (provided by others). Connectors required are 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.

AC Power connection is now complete and the DF15 is ready for sign configuration parameters to be set.

2.3.3 Float Charger Hook Up (Where supplied)

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 and 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
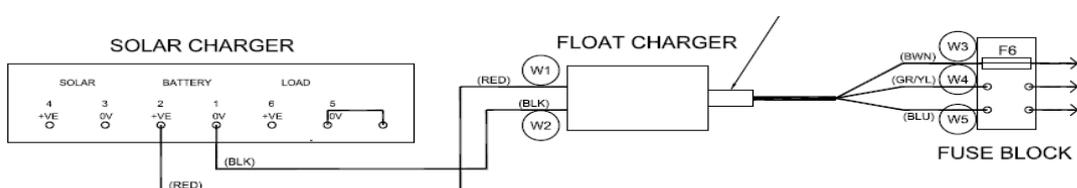
2.4 External Flashing Beacon

An external 12V DC flashing LED Beacon such as the model shown below can be fitted and controlled by the DF15 sign controller. The Beacon is designated to flash constantly unless the sign is set in covert mode using either the Timetable function or an external selector switch.

To allow the control function to be used, a 12V feed (+) should be taken from the WAGO power rail connector as marked by the red arrow in the view below through the Beacon and into Conn 12 on the Sign Control PCB as shown by the green arrow.
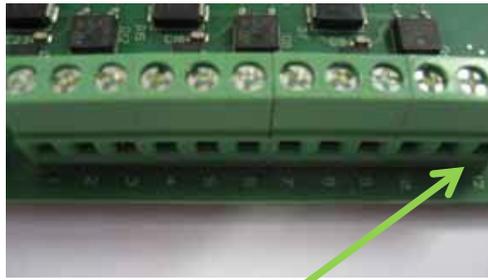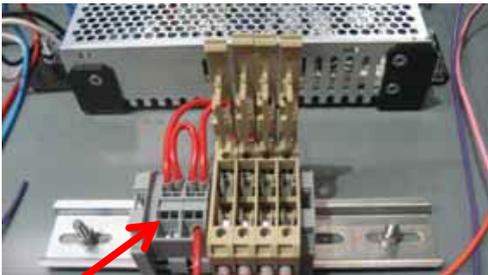
Dual Solar/AC version shown for reference

Simplified, the circuit will be:

12V Supply (+) → Beacon → Conn 12 (-)

3.0 Configuration and Setup

This section provides a guide to configuring of the DF15 once physical and electrical power supply procedures have been completed.

3.1 Setting Normal/Covert Mode

The DF15 Signs have the ability to operate in both active and stealth modes for data logging purposes. When first installed it is normal to set the sign in stealth mode to allow before speed data to be collected. Once a suitable amount of stealth data is collected the sign may be switched to active mode and data collection continued.

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 section 4.

Stealth mode is simply selected on the PDA/Laptop by unticking all the speed parameters.

3.1.2 Setting Normal/Covert Mode Using External Switching

Customers may if they wish utilize an external control means to switch the sign between Normal and Covert modes.

The switch unit should be connected to the main DF15 Control PCB using the screw down terminals for Input 2 and GND as illustrated below.

Simplified, the circuit will be:

CH2 (+) → Switching Unit → GND (-)

3.2 PDA Software

The PDA will come pre-loaded with DF15 software. This software is specific to the DF15 sign and will not operate in conjunction with Unipart Dorman VATCS.

3.3 DF15 Data Logger

This raw data may be downloaded from the sign to a hand held PDA/Laptop operating the Datalogger application software via a wireless Bluetooth connection, where it can then be manipulated in Microsoft Excel to allow the operator to attain average, percentile and percentile ranking of speeds.

More information on the functionality of both the Datalogger, Scheduler and VAMP Desktop applications are covered in the remaining sections of this guide.

4.0 Operating Instructions (PDA)

To run the DF15 data logger application on the supplied PDA, select the start menu and select DF15 V1.3 program shortcut in the drop down menu, this will run the program and will allow the operator to

establish a connection to the sign, configure the sign parameters, set the real time clock, request a status report, download speed data and upload timetable schedules.

Please note that it is not possible to alter the radar sensitivity using the PDA and this must be done from a PC/Laptop etc over the Bluetooth connection.

4.1 Initial Set Up

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

Set the PDA Time by clicking on the Start menu>Settings

Then after selecting the System Tab at the bottom of the screen 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 DF15 v1.3 Operating Software as shown

Once you have done this, click the CONNECT button. Please note that you will need to be within 15 feet of the DF15 sign in order for the Bluetooth™ to pick up a signal.

You will now be presented with a screen asking you to select a Bluetooth device similar to the one on below.

It may take a few seconds for the software to locate all surrounding Bluetooth devices.

A connection to a sign will appear here as an icon with a name that will be your unique Unipart Dorman Project No YYYY--XXX″ where YYYY is project number and XXX is the no of the sign.

E.g. 4321-001

To connect to the sign, select it on the screen and press the OK button. This will take you to the next screen where you will need to enter the Pairing Code/Passkey **0000**
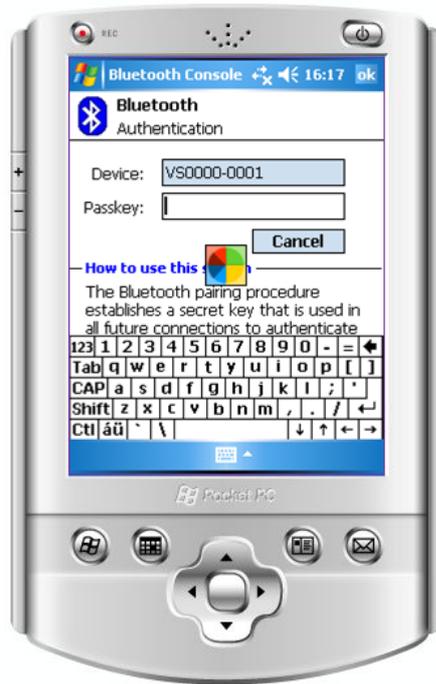
Upload the Real Time Clock Setting if required using the screen shown. (Instructions on setting the RTC are shown further back in this section)
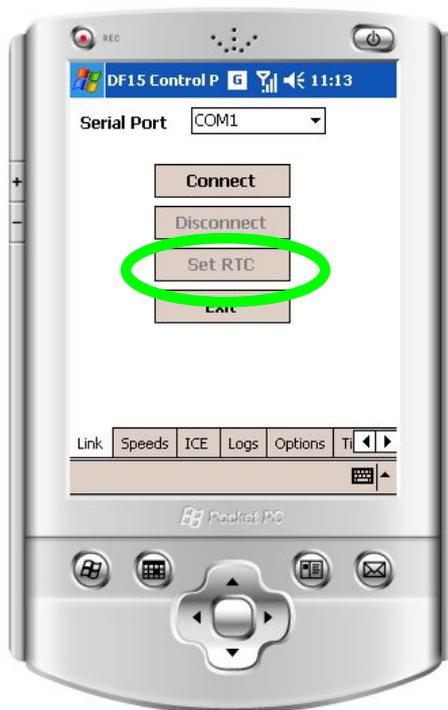
4.2 Setting Speeds

First select the SPEEDS tab at the bottom of the screen and then toggle between KPH or MPH using the radio buttons.

To set the sign in Stealth Mode untick all the speed selection boxes.

The Get Speed button will obtain the values currently set in the sign.

The speeds can now be set by ticking the relevant box and then adjusting the value in the box by clicking on the up or down arrow.

'Activation Speed' is the value at which if exceeded will trigger the sign to display a steady indication of the vehicle's approach speed.

'Notification Speed' is a higher value which if exceeded would cause the speed to be shown accompanied by the flashing Beacons. If the Beacons are disabled using the Options Tab the display will flash the vehicle approach speed at the driver.

'Slow Down Speed' is the next speed increment and above this value the display will alternate between the approach speed and the SLOW DOWN legend. Also, if the Beacons are enabled they will flash.

The Max Speed setting will disable the speed feedback to the driver to prevent the sign being used for 'highest score' competitions. However the Slow Down legend and Beacons (where enabled) will still flash.

4.2.1 Example Settings

Any Combinations of settings can be employed:

This combination would cause the sign to feedback a steady display of approach speed from 30, until 45 when the speed read out would cease. The Slow Down legend and Beacons (where enabled) will still flash.

This following combination would cause the sign to go straight to a speed feedback display plus flashing Beacons at 45. (where the Beacons are disabled the display would flash) At 50 the display would alternate between the speed display and the SLOW DOWN legend; and at 55 the display would change to the SLOW DOWN legend only with flashing Beacons where selected.
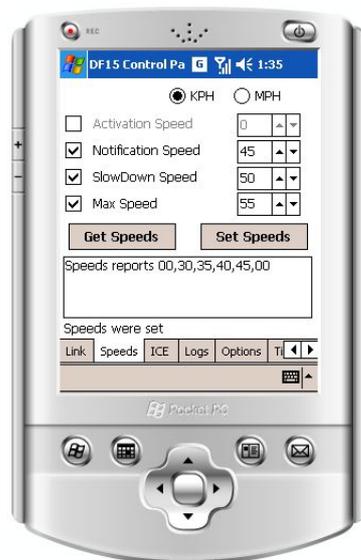
4.3 Setting the ICE warning

First select the ICE tab at the bottom of the screen and then toggle either Celsius or Fahrenheit radio buttons.

Then click SET and use the slider to set the threshold temperature.

The GET TEMP Button will retrieve the parameter already set in the sign.
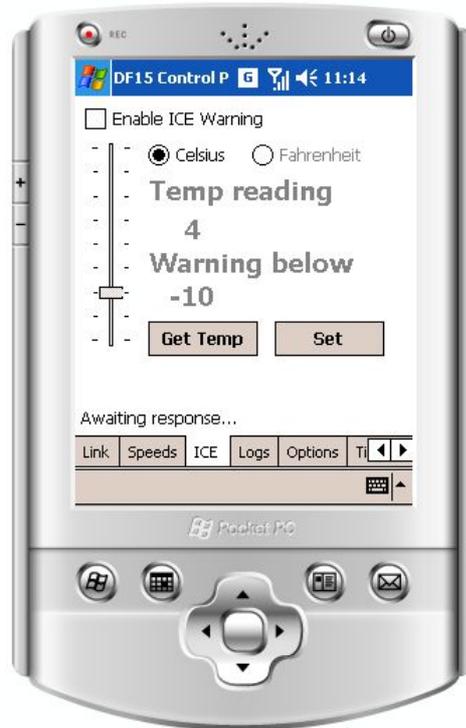
When the value is set ticking the Enable ICE Warning box will set the parameter into the sign.

The SLOW DOWN Legend which would normally be triggered is replaced by the SLOW ICE warning when the temperature drops below the set threshold.

The screen will confirm that the transfer was successful by a 'Temperature Was Set' dialogue appearing above the Tabs.

4.4 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 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.

4.5 Deleting a Log File

To delete the log file from the DF15, 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.

4.6 Options

Clicking on the Options Tab will allow you to set some unique options to enhance the signs operation.

Get Options will download the Options already set in the sign.

Ticking the Beacons Enabled box ensures that where the correct parameters are set all relevant displays will be accompanied by the Beacons in each corner of the sign flashing in alternating horizontal pairs.

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 Speed Feedback into distinct events which will indicate to drivers their individual speed.

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

Toggling between Standard and Power Saving on the brightness option allows the brightness of the displays to be reduced slightly independent of the automatic dimming facility, and can be used to preserve battery life in solar powered signs.

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

6.12 Transferring a Timetable to a DF15 (PDA Only)

Once a timetable file has been created on a Laptop/Desktop and saved, it can then be uploaded to one or more DF15 signs. To do this, the timetable file needs to be transferred to the supplied PDA so that it can be uploaded to the sign wirelessly.

To copy Timetable files to a PDA, the PDA must first be synchronized with the PC where the timetables are saved. This is achieved using Microsoft Active Sync/Windows Mobile Center (supplied with the PDA).

If Active Sync/Windows Mobile Center is not already installed on the PC then it should be installed from the disk that was provided in the PDA's packaging. Please refer to Microsoft's documentation for details of how to install Active Sync/Windows Mobile Center. Once Active Sync/Windows Mobile Center is installed, the PDA must be connected to the PC via the USB cable which was supplied with the device. After connection, Active Sync/Windows Mobile Center will automatically attempt to synchronize with the PDA. If you have already configured Active Sync/Windows Mobile Center to recognize and synchronize with your device, then connect as normal. Alternatively, you can choose to connect as a guest.

Next click the button marked Explore. This will open a window, entitled Mobile Device which displays the PDA's file system. With this window still open, open a new window and locate the previously saved timetable file(s) you wish to upload.

Select the file(s) required and either copy and paste or drag them to the Mobile Device window. You may be asked if you wish to copy the files to your PDA in which case, confirm the transfer. This transfer process will store the timetable files in the My Documents file on the PDA.

First tap the Timetable tab and then tap **SELECT** on the PDA screen.

This will bring up a file browser which will indicate any .vtt files that are stored in the My Documents file of the PDA. If the .vtt file you wish to use is in another directory then you may need to navigate to that directory to locate the file. To choose which file to upload, simply tap on the appropriate filename from the list. This will begin the upload process. A progress bar will appear showing the status of the upload process. The PDA will indicate when the transfer is complete.

Once Uploaded, to enable the timetable, simply tap the button, **ENABLE**. If no timetable has currently been uploaded, the PDA will return an error. Similarly, to return the sign to its default, non-switching mode, the timetable stored can be disabled. To disable the timetable, tap the **DISABLE** button.

4.7 Exiting the PDA Program

From the Link Tab at the foot of the screen, select Disconnect to close the Bluetooth link to the sign and then click Exit. This should return you to the PDA HOME Screen.

4.8 LDR and Advanced Tabs

There are additional Tabs at the bottom of the screen labelled LDR and Advanced. These are for use by Unipart Dorman only and are password protected.

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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 VATCS 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 .
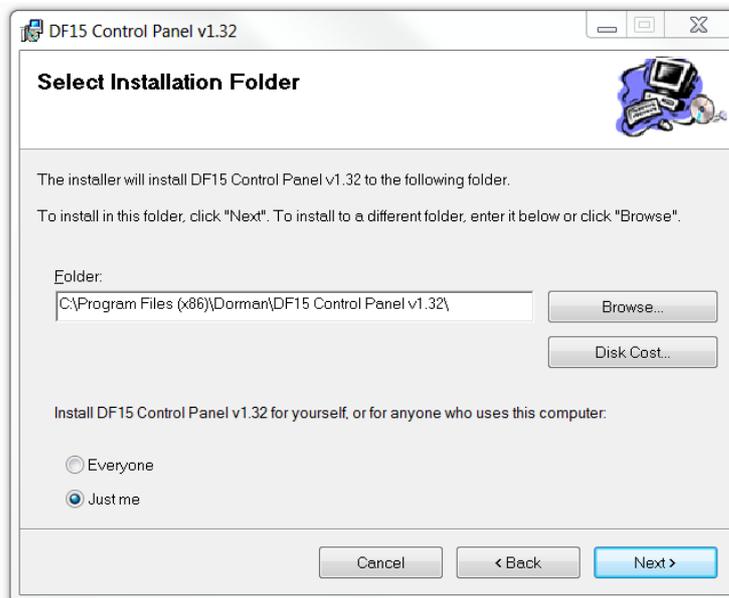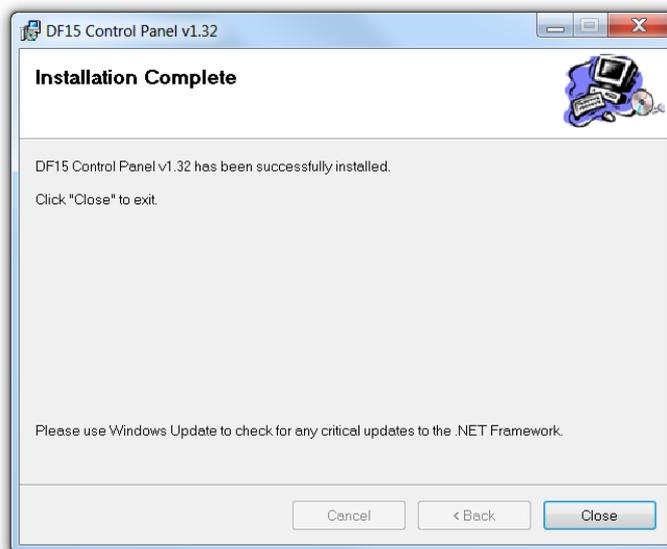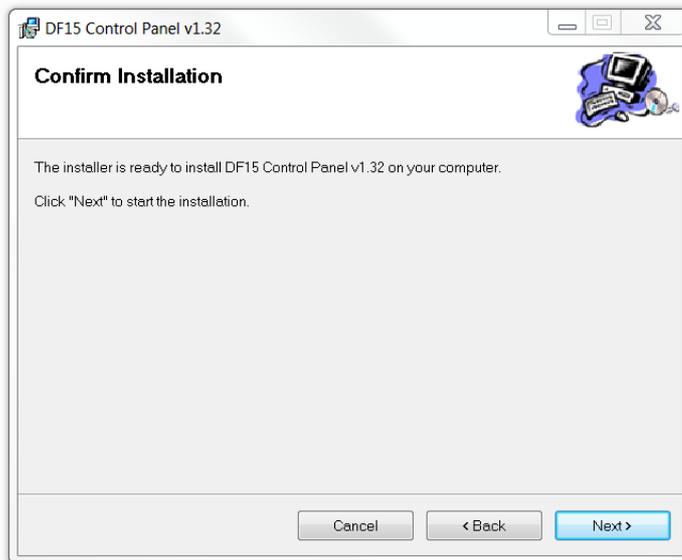
If you are using Windows 7 (or earlier versions of Windows) From the Start Menu please select the DF15 Control Panel v1.32 Operating Software as shown:

29
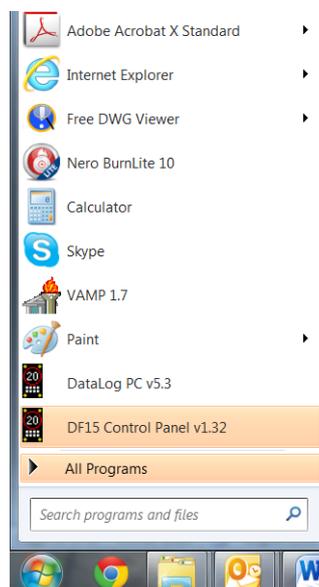
If you have Windows 10, in the Start Menu select All Apps and Programs then open the Unipart Dorman folder. Find the DF15 Control Panel and double click to run it:
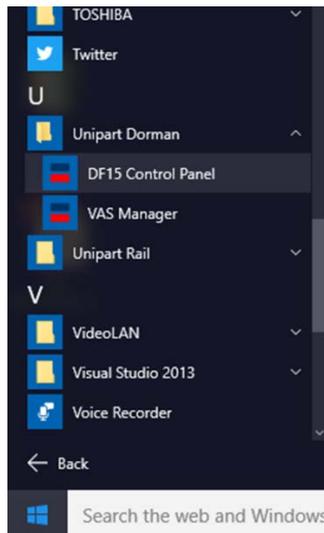
Initially, you will be presented with this screen:
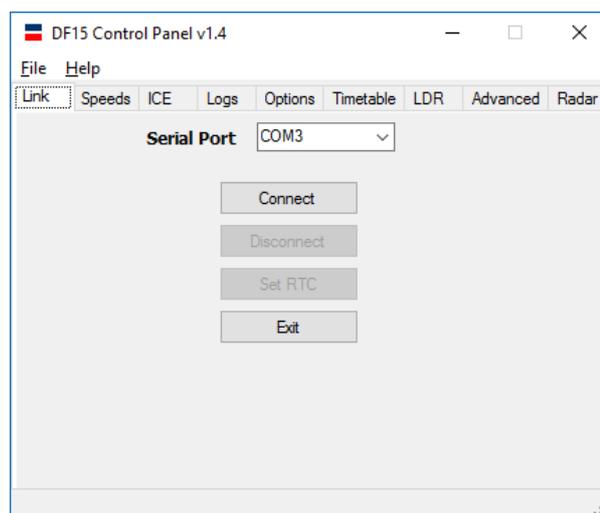
Using the dropdown, select which Serial Port you will be using for Bluetooth communications and once you have done this click the CONNECT button.

Please note that you will need to be within 15 feet of the DF15 sign in order for the Bluetooth™ to pick up a signal.

5.1 Setting Speeds

First select the SPEEDS tab at the top of the screen and then toggle between KPH and MPH using the radio buttons

To set the sign in Stealth Mode untick all the speed selection boxes

The 'Get Speeds' button will obtain the values currently set in the sign. If there are no speeds set in the sign this button will be grayed out. Similarly the 'Set Speeds' button will also be grayed out until changes are made to the parameters and these are ready to be transmitted to the sign.

The speeds can now be set by ticking the relevant box and then adjusting the value in the box by clicking on the up or down arrow.

'Activation Speed' is the value at which if exceeded will trigger the sign to display a steady indication of the vehicle's approach speed.

'Notification Speed' is a higher value which if exceeded would cause the speed to be shown accompanied by the flashing Beacons. If the Beacons are disabled using the Options Tab the display will flash the vehicle approach speed at the driver.

'Slow Down Speed' is the next speed increment and above this value the display will alternate between the approach speed and the SLOW DOWN legend. Also, if the Beacons are enabled they will flash.

The Max Speed setting will disable the speed feedback to the driver to prevent the sign being used for 'highest score' competitions. However the Slow Down legend and Beacons (where enabled) will still flash.

Examples of different combinations can be seen in the PDA section above.

5.3 Retrieving Log Files

To download a log file , hit select button to create a file name under a directory of your choice on your PC, by clicking on file name to save the file , you will be taken back into the program where you can hit use the get log button and download the data into the same file
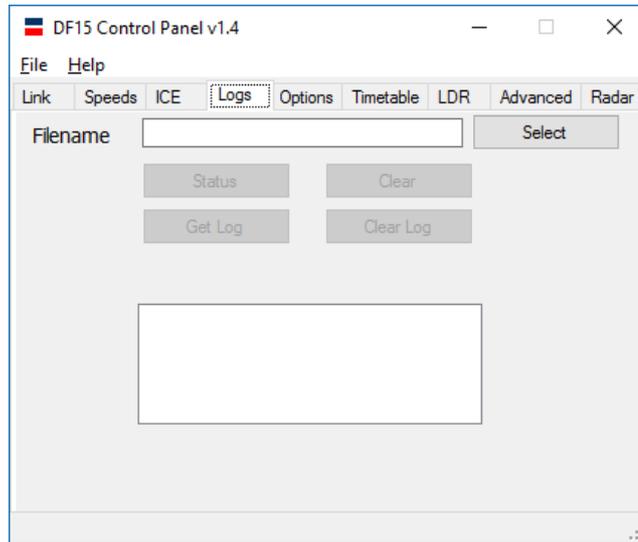
Note:

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.

5.4 Deleting Log Files

To delete the log file from the Sign, type the Password LOGCLR into the Filename box then click the CLEAR LOG button. (This button will remain greyed out until a log file is available for deletion).
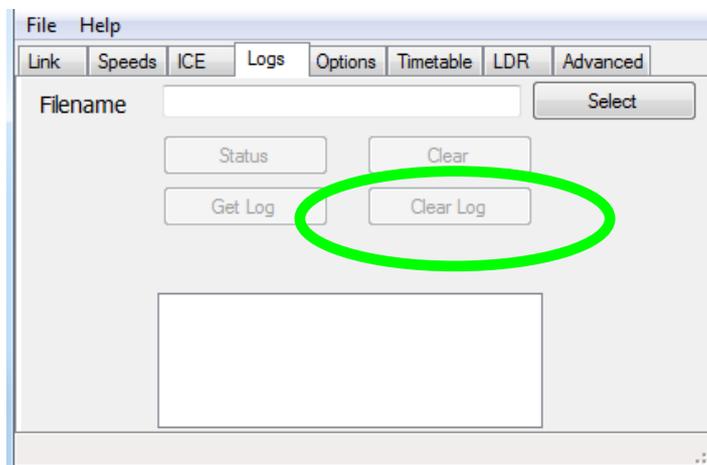
DELETING THE LOG IS A ONE CLICK OPERATION AND IS PERMANENT. THE LOG FILE CANNOT BE RETRIEVED ONCE YOU HAVE DELETED IT.

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

5.5 Options

Clicking on the Options Tab will allow you to set some unique options to enhance the signs operation.

Get Options will download the Options already set in the sign.

Ticking the Beacons Enabled box ensures that where the correct parameters are set all relevant displays will be accompanied by the Beacons in each corner of the sign flashing in alternating horizontal pairs.

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 Speed Feedback into distinct events which will indicate to drivers their individual speed.

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

Toggling between Standard and Power Saving on the brightness option allows the brightness of the displays to be reduced slightly independent of the automatic dimming facility, and can be used to preserve battery life in solar powered signs.

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

5.6 Timetable Management

Before this option is available a Timetable must be created using the V-AMP software. This is covered elsewhere in Section 6.0 of this Handbook. The three buttons enable you to select which timetable to use and whether it is in use or not
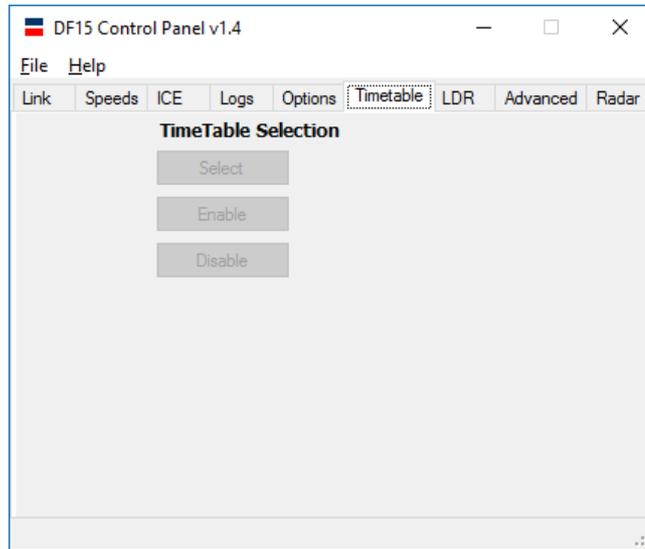
5.7 Setting the Ice Warning

First select the ICE tab at the top fo the screen abd then toggle to either Fahrenheit or Celsius. The GET TEMP button will retrieve the threshold temperature set in the sign.

Simply click on SET and using the sider control set the trigger threshold temperature. When this temperature is detected by the sign, the SLOW DOWN legend is replaced by a SLOW ICE warning. To set this temperature in the sign please check the Enable ICE Warning box.
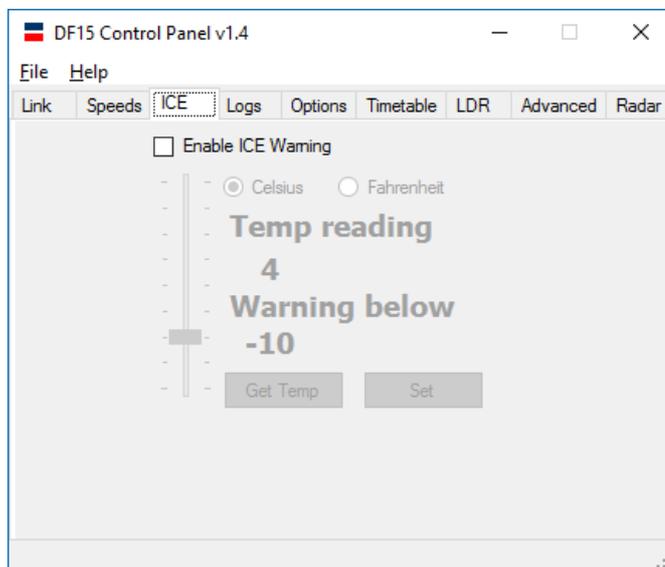
5.8 Adjusting the Radar Sensitivity

Certain site conditions may require the radar sensitivity to be altered from the standard factory setting.

Select the Radar tab and enter a percentage value of between 1 and 99, then click the "Set Sensitivity" button to update the new setting to the sign.

The table shown can be used as a guide to determine the sensitivity setting. (By default all radars are programmed to 40%).
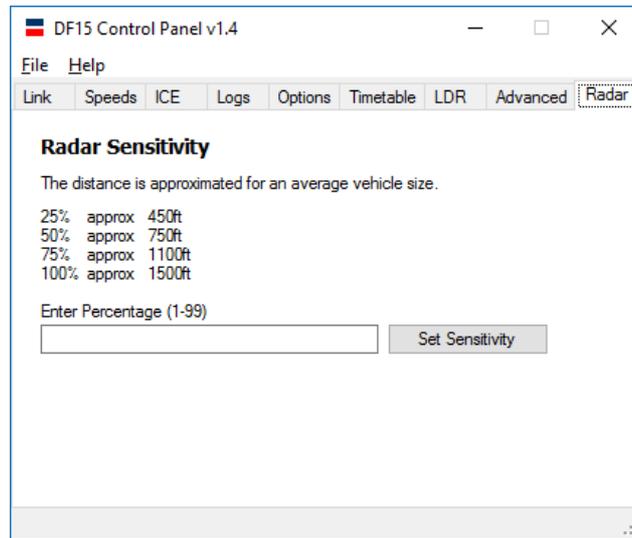
5.9 Exiting the Program

The program is exited after selecting the 'Link' tab and then clicking on 'Exit'
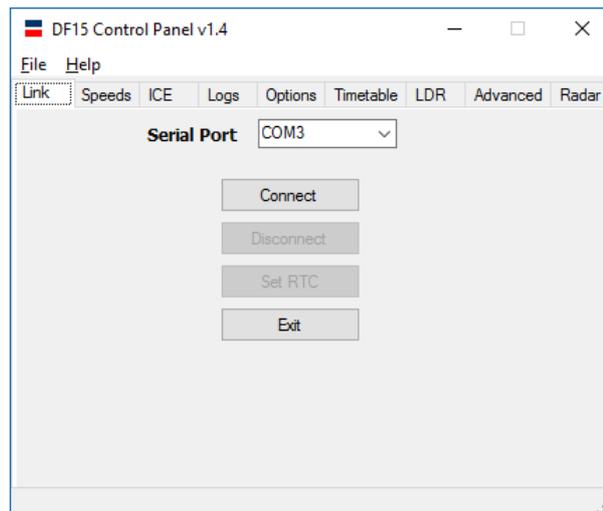
6.0 Setting a Timetable

6.1 Introduction

V-AMP is Unipart Dorman's switching timetable editing application designed to work with DF15 Signs. V-AMP provides tools for designing timetables to instruct the sign to automatically change display modes. Timetables created using V-AMP can then be uploaded to one or more DF15 wirelessly using the supplied PDA via a Bluetooth connection.

6.2 Overview of Timetable System

V-AMP provides a simple method of creating a switching timetable for your DF15. 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. Once a base timetable is defined, 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 schedule defined for the alternative period. 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

When the V-AMP application first opens, the user is presented with the following menu screen, select the DF15 button.
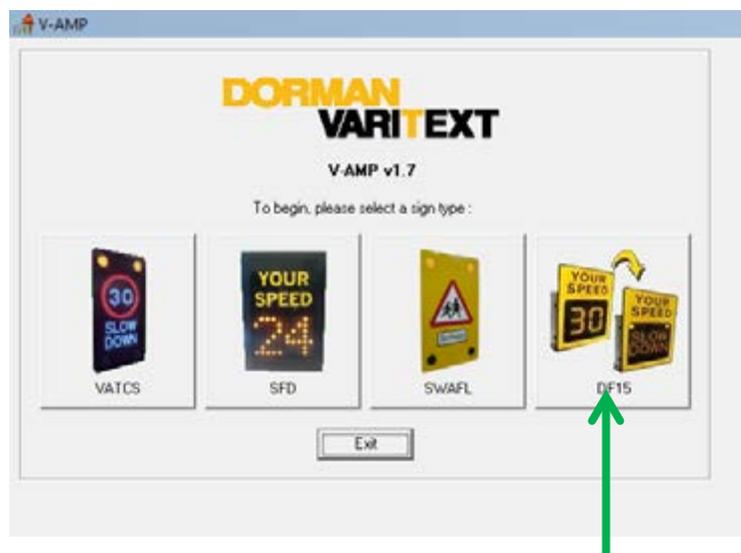
A blank timetable is presented and this allows you to begin editing straight away. If a timetable is already open, a new timetable can be created by selecting File>New Timetable from the menu bar. If the current timetable has unsaved changes, you will be prompted to save, ignore or cancel.

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.
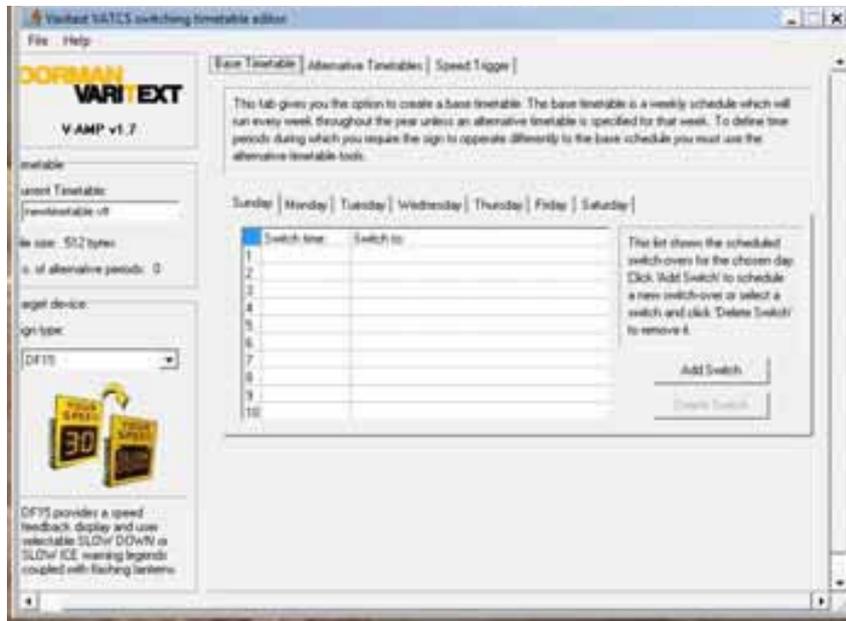
6.5 Adding a Switch-Over to a Schedule

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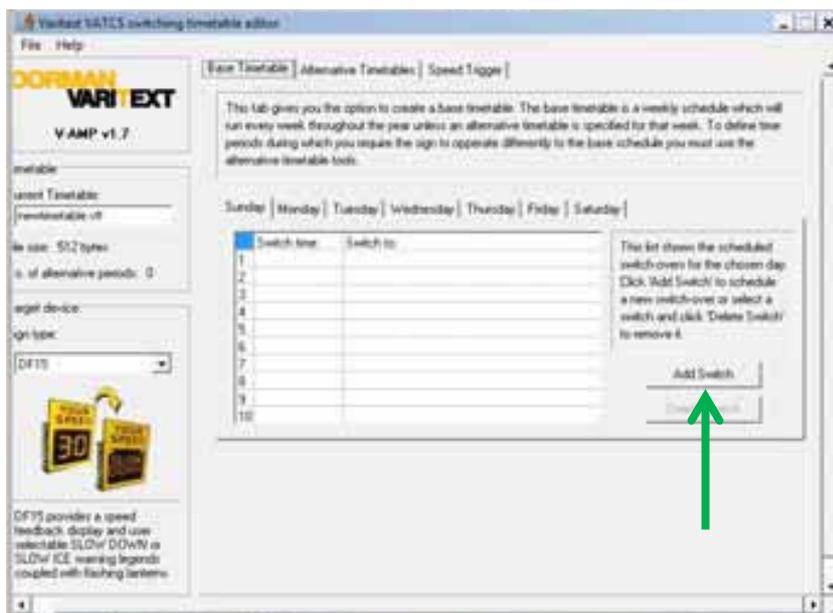
A new window will appear as shown below, giving the various options relating to the switch. The switch-over can be applied to multiple days during the weekly schedule by checking the boxes for the required days. The 'All', 'Weekdays' and 'Weekend' buttons provide a quick method of selecting days.

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.
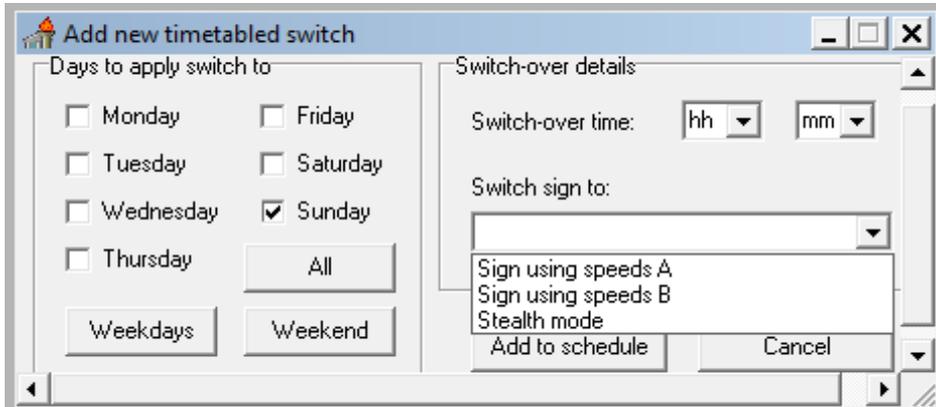
6.6 Removing a Switch-Over from a Schedule

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'.
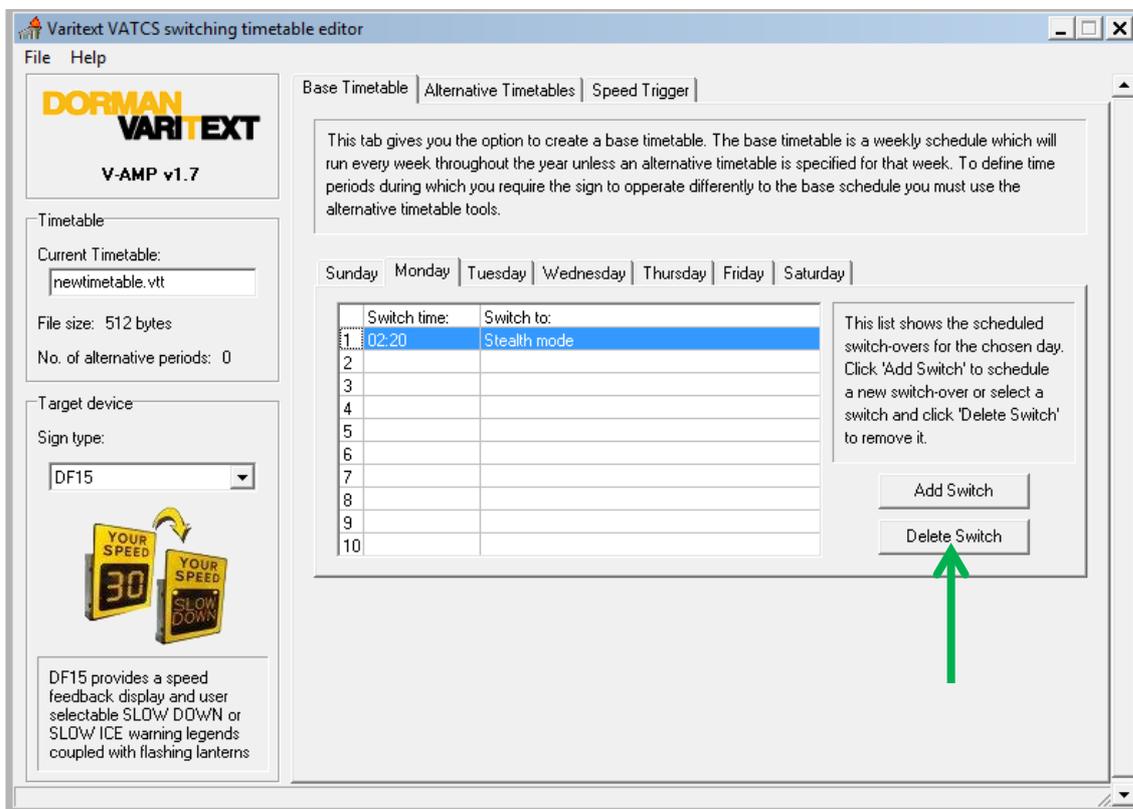
6.7 Creating an Alternative Timetable

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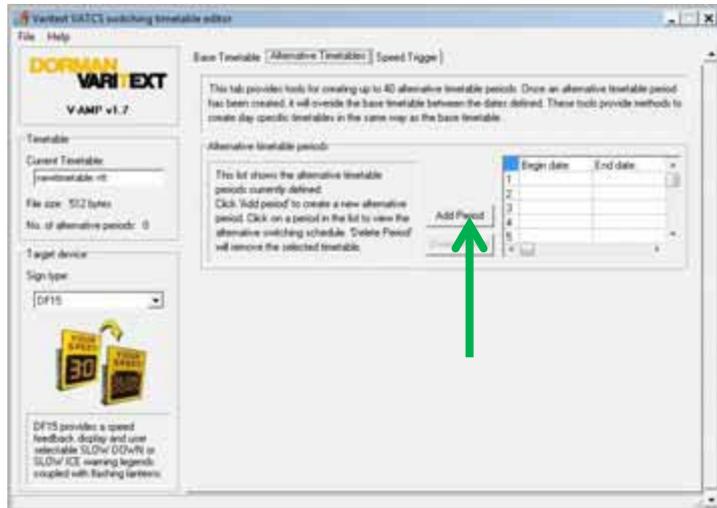
6.8 Adding an Alternative Schedule Period

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 DF15 to remain in its default state for each day defined by the alternative period.
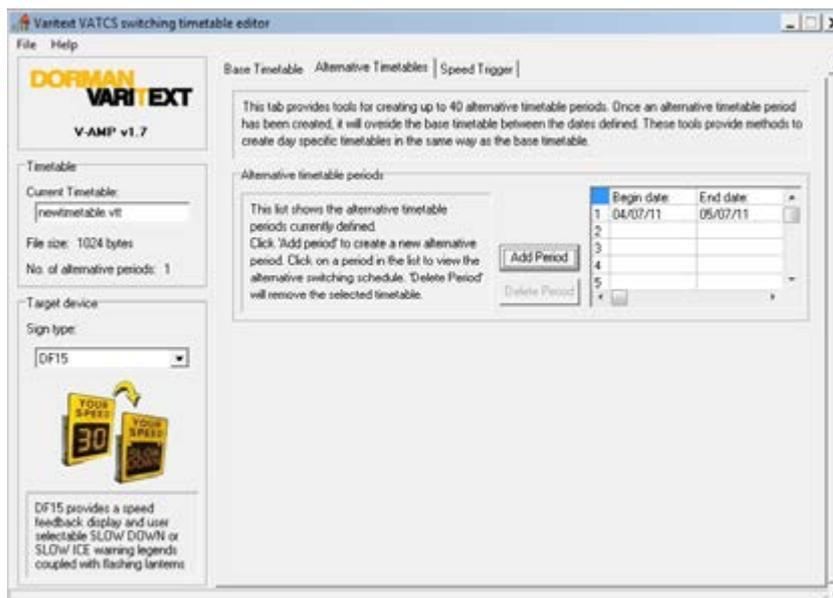
6.10 Removing an Alternative Schedule Period

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

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 by the arrow and then select each individual speed parameter by clicking on the drop downs as shown.
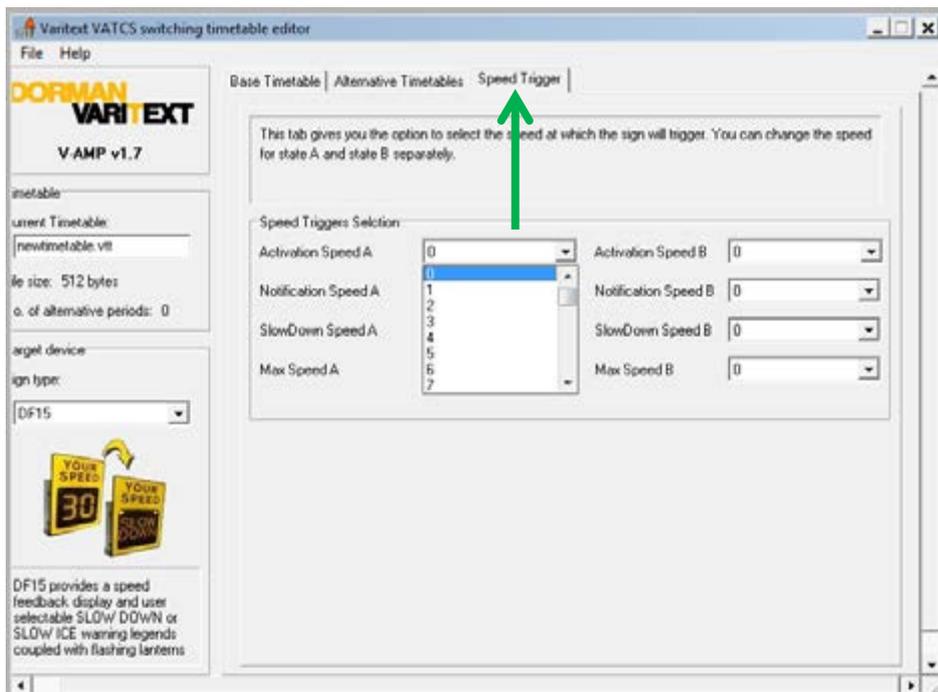
7.0 Repair & Maintenance

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.

7.1 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.

7.2 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.

7.3 First Line LRU Maintenance.

The DF15 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 (line replaceable unit) for return and repair.

The DF15 series of signs is made up of the following LRUs:

Si-3 Radar
DF15 Controller Card
DF15 PSU
DF15 Display Modules (display specific)
SS6 Charge controller
80W Solar Panel
12V 20amphr battery

It is recommended the client maintains a spares holding of LRUs commensurate with the quantity and types of DF15 model deployed to ensure minimum downtime of any DF15 due to failure. It is also recommended that the client maintainers are trained in the operation and maintenance of the DF15 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 DF15 have no field maintainable content. However, a trained maintainer may quickly diagnose the fault and replace the modular item causing it.

7.4 Replacing Components

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.
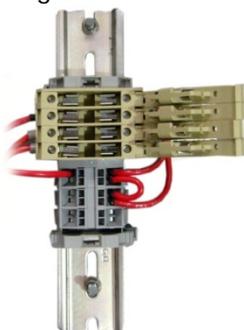
7.5 Replacing the Control Board

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 grub screws securing the cables to the board. (Please note that the picture above is a representation of a control board installation and colors/positions of cables may differ)

Remove the four cross head screws in the corner of the board and lift it out.

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.
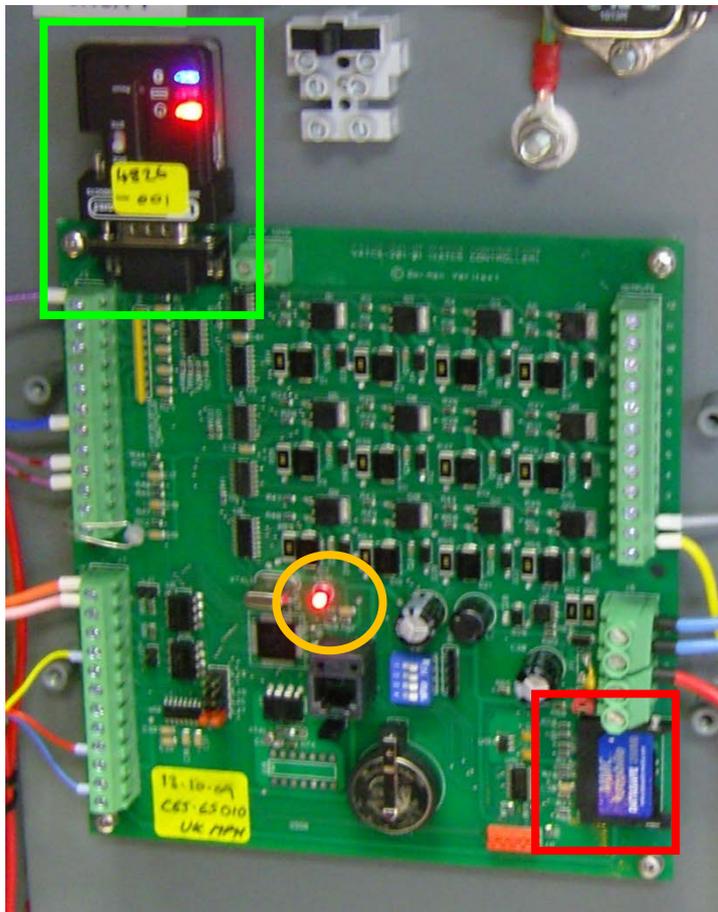
Restore power by refitting the fuse barrels, and ensure the red indicator LED on the control board (ringed in orange above) flashes approximately once every second.

When the control board is replaced it will be necessary to carry out the initial set up as shown in Section4.0/5.0 and reinstall any timetable information. If the radar sensitivity was altered from the factory setting at initial installation or if you are unsure please see section 5.8 to check and adjust as required. (The radar sensitivity cannot be accessed with a PDA).

7.6 Replacing the MVD

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.
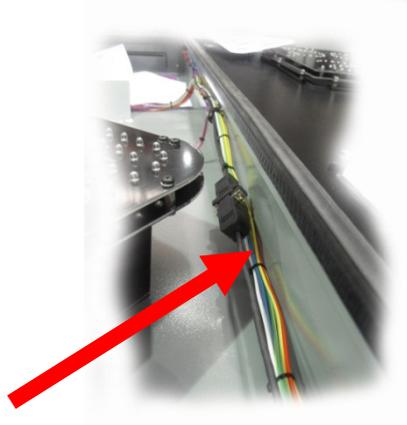
The MVD head can then be removed from the support bracket using a 3/16″ Allen Key.
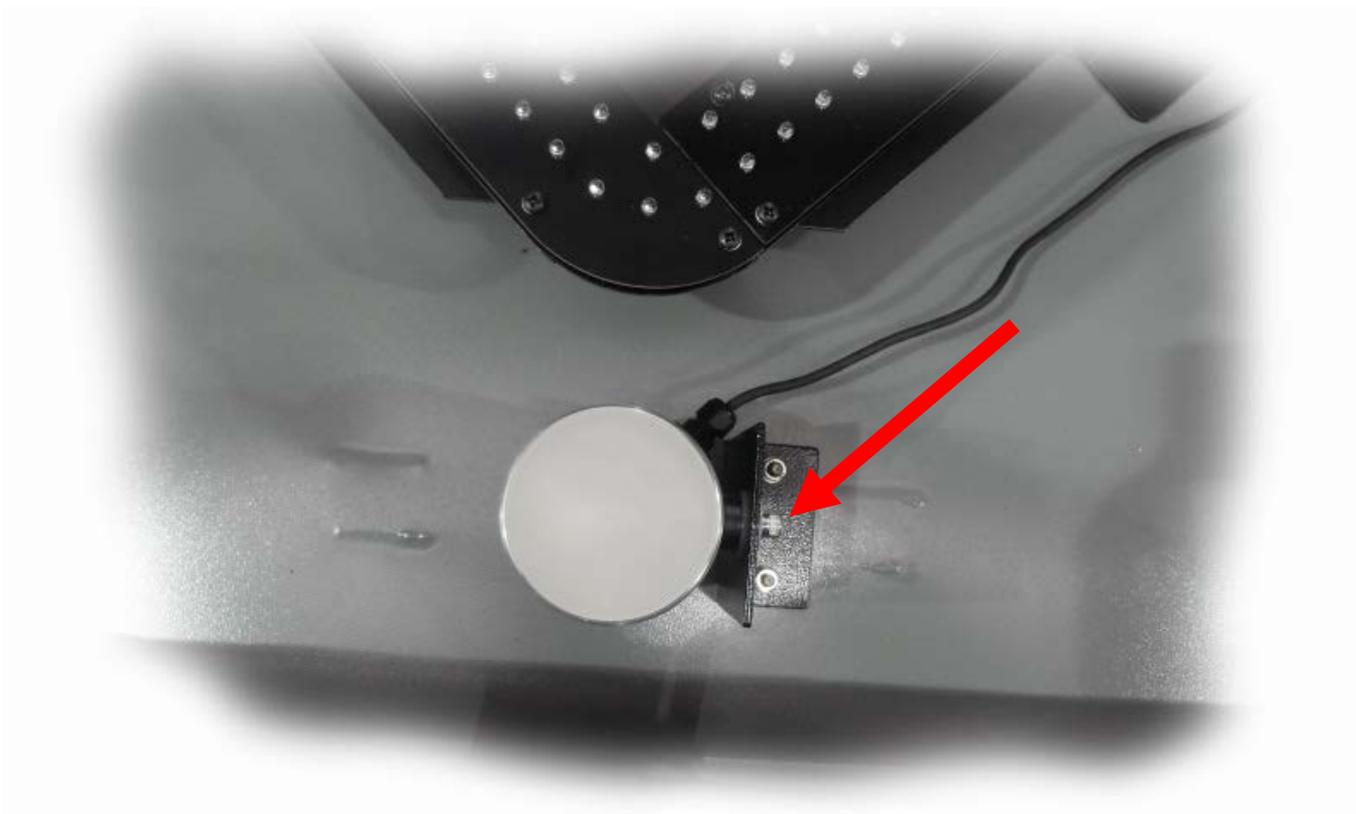
Fitment is a reversal of removal. It should be noted that if the insulating washers indicated in the pictures below are not fitted, and an earth path is created, the MVD will not function and may suffer irreparable damage.

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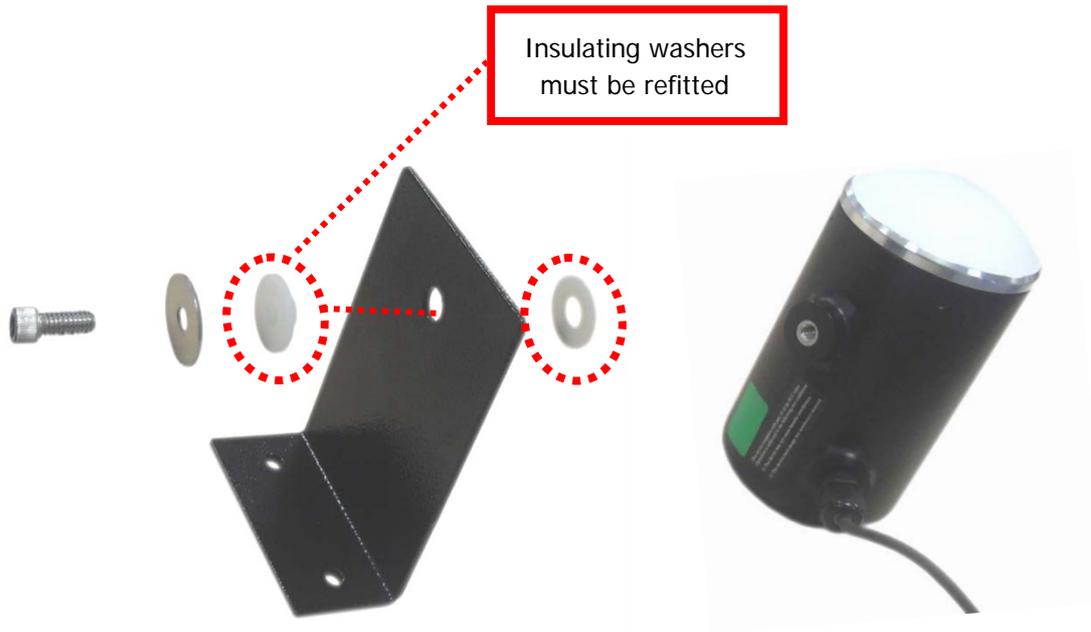
The cable should be tidied and cable ties fitted as required.

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

Replacing the MVD does not alter the radar sensitivity setting

7.6.1 Replacing the MVD (Houston Radar only)

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.

Replacing the MVD does not alter the radar sensitivity setting

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7.7 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 in the red boxes
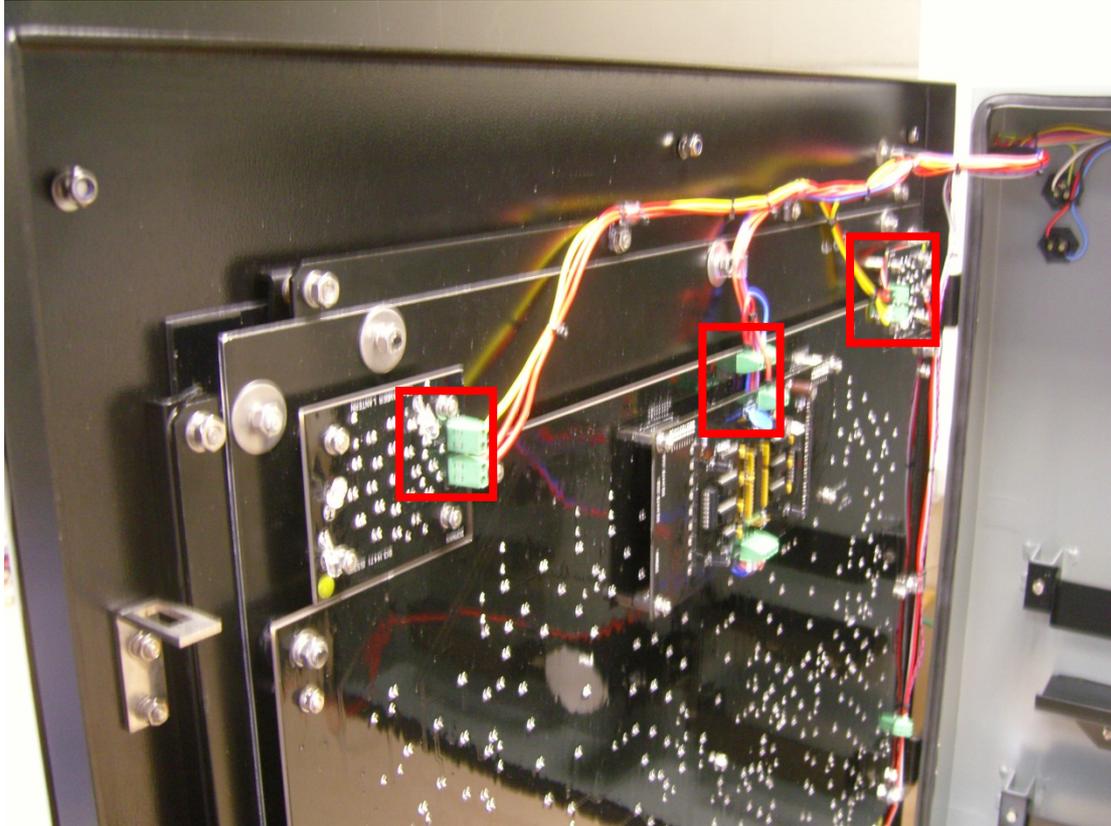
 Please note cable identification may vary with build standard and to ease reconnection Unipart Dorman strongly advise the marking of each cable position prior to disconnecting.

This space intentionally blank

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7.8 Fuse ratings and position

Fuse F1
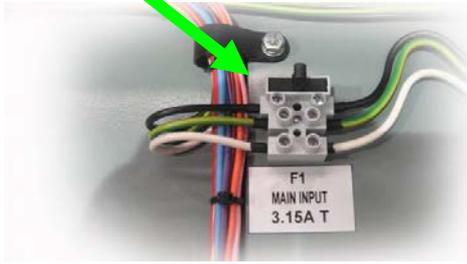
This fuse protects the equipment against AC supply voltage anomalies and is a time delay fuse rated at 3.15 Amps

Fuse F2
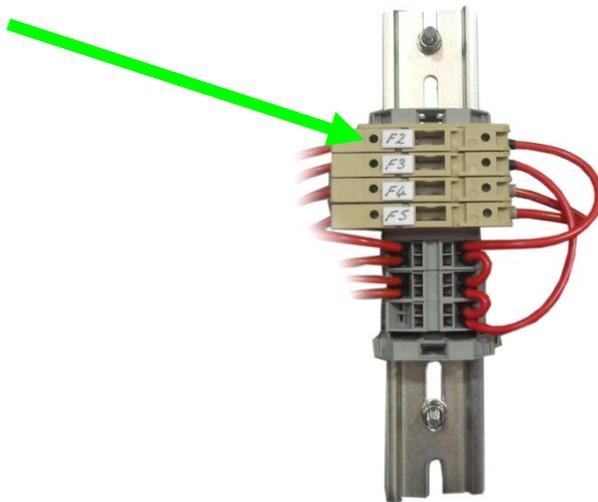
Fuse F2 protects the control board where supplied from the AC-DC PSU and is rated at 5 Amps (Time Delay)

Fuse F3
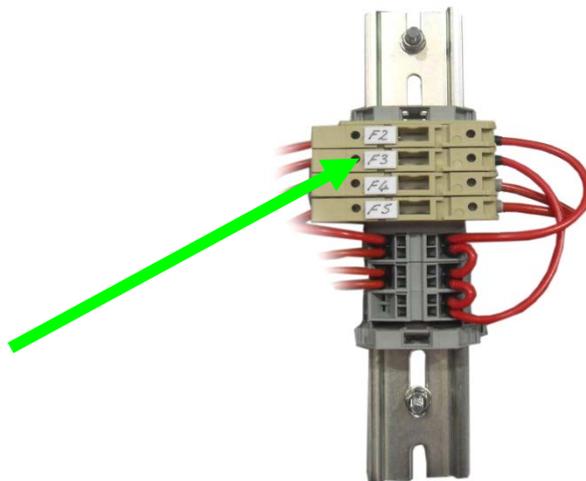
Fuse F3 protects the control board where supplied from the SunSaver 10 Solar Controller and is rated at 5 Amps (Time Delay)
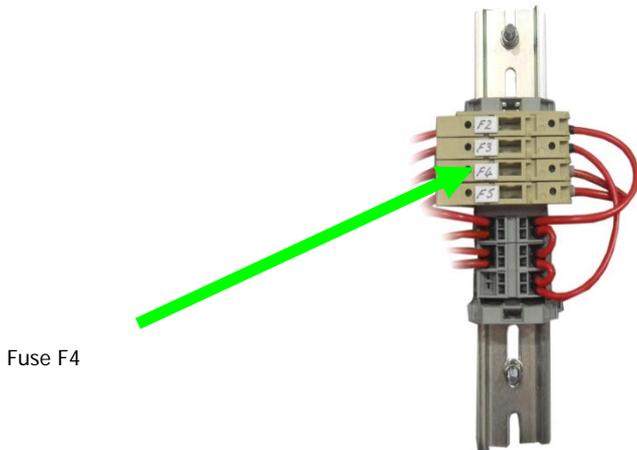
Fuse F4

Fuse F4 protects the battery supply and is rated at 10 Amps (Time Delay)
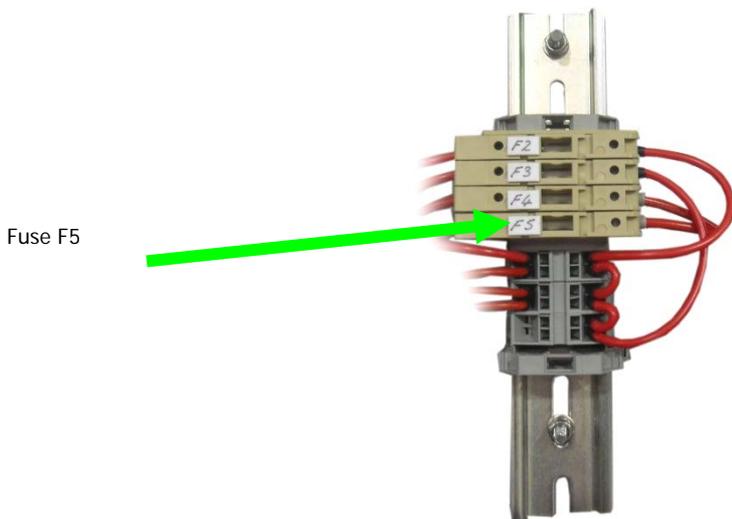
Fuse F5

Fuse F5 protects the battery supply and is rated at 10 Amps (Time Delay)

7.9 Radar Performance

If there are problems where the sign is triggering late or fails to trigger when the approaching vehicle is clearly exceeding the set speed, consideration should be given to clearing all significant radar energy reflectors from within the radar footprint. If the problem persists, please see the instructions for adjusting the radar sensitivity in section 5.8 or contact Unipart Dorman for further advice.

8.0 PDA Software Application Troubleshooting

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

After Selecting the Bluetooth Connection to the Sign, the Software Does Not Reappear On the Display

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.

Keyboard Icon Does Not Appear On Software

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

Sign Remains Connected to the PDA after Closing the Software

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 DF15 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).

The Bluetooth Device Selection Screen Does Not Appear When You Click the CONNECT Button.

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.

Other Problems
If you have any other problems with the software, resetting the PDA will get the DF15 software back into its original state. To do this, use the PDA pen to press and hold the small button at the side of the PDA. The PDA should take a few moments to reset.

9.0 Troubleshooting Flowcharts

The flowcharts provided at the end of this User Guide are not exhaustive but are designed to provide some guidance to fault finding.

10.0 Glossary of Terms

AC   **Alternating Current**

Amp/Hr   **Amperes per Hour**

CD   **Compact Disc**

DC   **Direct Current**

Hz   **Hertz**

IP (65)   **Ingress Protection Rating**

KPH   **Kilometers per Hour**

LRU   **Line Replaceable Unit**

M   **Meter**

MMC/SD   **Memory Card Variants**

MPH   **Miles per Hour**

MVD   **Moving Vehicle Detector (Radar Unit)**

PDA   **Personal Digital Assistant**

PSU   **Power Supply Unit**

RF   **Radio Frequency**

RTC   **Real Time Clock**

V   **Volt**

W   **Watt**

MAIN FAULT FINDING

Speeding vehicles do not trigger sign

Is the red LED on the front of the sign lit ? — **No** → Is the sign powered → Refer to the correct power supply fault finding chart for assistance

Yes

Is the red activity LED flashing on the main PCB? — **No** →

Yes

Is the sign set in Covert Mode? — **Yes** → Set the selector Switch to 'Normal'

No

Are the spped settings and any timetable options — **No** → Refer to relevant section of this handbook tfor checking and

Yes

Does the MVD have an unobscured view of the road?? — **No** → Clear any obstructions

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

No ↓ (from red LED)

Replace Solar Controller

Yes ↓ (green LED)

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.

No ↓ (DIN Rail fuses)

Replace Fuses (See Note 1)

Yes ↓ (red activity LED)

Return to main Fault Diagnosis Chart

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

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) →

↓ **Yes**

Is PSU delivering — **No** → Replace PSU →

↓

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

↓ **Yes**

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

↓ **No**

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

↓ **Yes**

Replace PCB

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

End of Process

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