



Technical Bulletin

DFS Speed Data Logging

January 2004

Intelligent Transportation Systems

Driver Feedback Sign

1. Introduction

This technical bulletin describes the speed data logging feature for Driver Feedback Signs (DFS) equipped with remote and/or local communication devices. The following items are addressed in this document:

- Speed data logging overview
- Speed data processing
- Speed data storage
- Speed data download

Note that this feature requires installing DFS-SCS (Speed Collection Software) on a personal computer and having a communication link to the DFS.

For wireless GSM communication a data modem and access to a GSM network is required (*please refer to GSM Comm. Setup technical bulletin*). For a wireless Radio Frequency link a RF modem is required. In case a DFS provides an external serial port communication can also be established with a serial cable using a PC's local serial port (Does not apply to signs built before 2004).

2. Speed Data Logging Overview

Speed data logging provides users a means to collect vehicle speed data recorded by the sign's internal radar. Speed data download using the DFS Configuration Software tool with speed data logging (DFS-SCS) allows users to create reports of vehicle speeds on their roadway.

Within the sign, the speed data logging feature involves several logical units as shown in the image below. On the input side is the actual traffic; on the output side is a text file that contains information about the speed of the traffic.

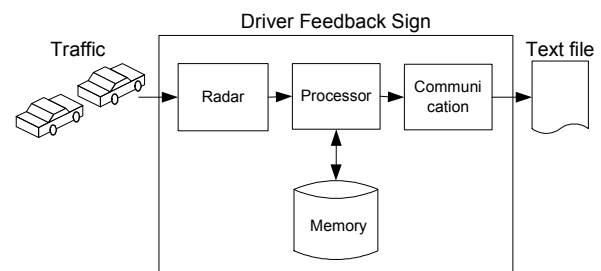


Figure 1 Logical schematic of speed data logging

The DFS registers the speed of on-coming vehicles when it is in radar mode and the sign is scheduled to be active (*refer to DFS User Manual*). It processes speed information according to a specific scheme and stores the data in the internal memory.

The DFS-SCS software can be used to communicate to the sign in order to download the speed data into a formatted file on the PC. From there, the speed information may be imported into other applications like MS Excel for report and/or graphical representations.

3. Speed Data Processing

Although the radar within the sign can deliver several measurements per second the display of the sign is updated only every second to avoid overloading the drivers with information.

As shown in Figure 2, for speed data logging purposes only the highest measured speed within each ten-seconds interval is used if available. A measurement reflects the speed of the one fastest vehicle in the ten-seconds interval. The speed of any other vehicles within this interval is not recorded.

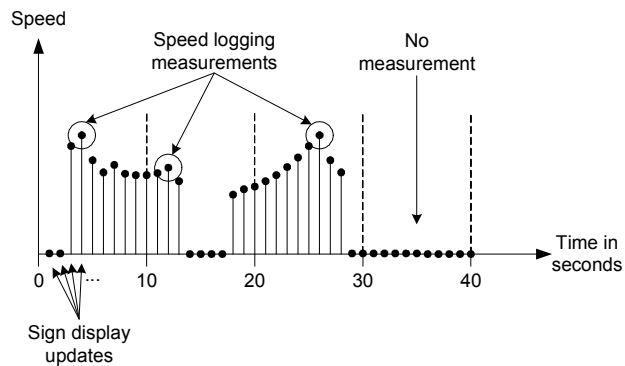


Figure 2 Ten-seconds speed measurement intervals

The processing unit creates a histogram with 10 bins, where each bin represents a speed range as specified by two user-defined parameters: “Lowest measured Speed” and “Speed Interval”. The speed measurement for each consecutive ten-seconds interval increments the corresponding speed bin.

After the ten minutes the histogram is stored in the memory module and a new histogram is created. The maximum number of entries in one histogram equals the number of ten second intervals in ten minutes, i.e. 60.

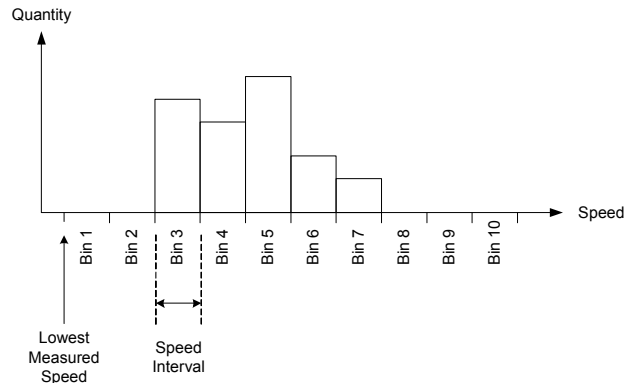


Figure 3 Ten-minutes speed histogram

4. Speed Data Storage

The data is stored in a memory module. This module provides enough memory space for approximately 129 hours of continuous traffic observation. After that time, i.e. when the memory is full, new data entries will replace the oldest entries first (FIFO-memory).

The memory module requires power to maintain the stored data. A small rechargeable battery is used to prevent data loss during a power failure. A charged battery protects the memory from data loss for approximately four weeks. The battery is recharged as soon as the DFS is powered up again. Recharging a completely drained battery takes two weeks.

5. Speed Data Download

The traffic speed data in the memory can be downloaded into a text file with comma-separated values (.csv) by using the DFS-SCS software. The file is placed in the DFS-SCS program startup folder by default and it can be identified by its filename according to the following scheme:

sp_AAA_YYYY_MM.csv

Here AAA is the address of the sign, YYYY is the year, and MM is the month.

The file contains one line of text for each ten-minutes speed histogram and for some additional information. The following lines are an example for the content of the speed data file.

```
2003/09/17 17:05:33,001,40,5,0,0,0,3,6,20,8,0,0,0
2003/09/17 17:15:33,001,40,5,0,0,2,7,7,18,2,4,0,0
2003/09/17 17:25:33,001,40,5,0,0,0,3,0,10,3,0,2,0
```

...

Each row consists of 14 comma-separated entries that have the following meaning and format:

1. Date and Time in this format
YYYY/MM/DD hh:mm:ss
(e.g. 2003/09/17 17:05:33)
2. Sign address in three digit format (e.g. 001)
3. Lowest Measured Speed (e.g. 40 km/h)
4. Speed Interval (e.g. 5 km/h)
5. Bin1 (e.g. 40 - 45 km/h),
6. Bin2 (45 - 50 km/h),
...
14. Bin10 (85 - 90 km/h)

The speed data download always begins with the oldest (i.e. first) line and ends with the newest one. In case the download is interrupted before it could be completed, the file will not contain the latest added lines. Only a partially downloaded file is available then.

However, the software will append data to the monthly speed file. In case the download fails it can

be restarted and will automatically pick up where the failed attempt left off.

A new speed file will be created upon the first download of the new month.

Related Documents

- *Driver Feedback Sign Installation Manual*
- *Driver Feedback Sign Service Manual*
- *Driver Feedback Sign User Manual*
- *GSM Comm. Setup Technical Bulletin*

Technical Support

If you have questions or comments concerning this Technical Bulletin, please call the 3M Intelligent Transportation Systems Technical Service department at: 1-800-258-4610 (Press 5 when prompted for Driver Feedback Signs) or 651-575-5072 or contact your local 3M subsidiary.

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