



Driver Feedback Sign

DFS 700 Model

3M™ Driver Feedback Signs (DFS) are effective speed calming tools for traffic authorities. The new DFS 700 model offers a state-of-the-art LED display technology for informing drivers about their vehicle's speed and/or reminding them of the given speed limit.

Vehicle speeds measured by the built in microwave radar are displayed to drivers and logged for analysis of average and 85th percentile speeds, speed trends by time of day, etc.

Driver feedback signs are often used on road where compliance with the posted speed limit is essential for traffic safety.

Example locations are:

Areas where Speeds change

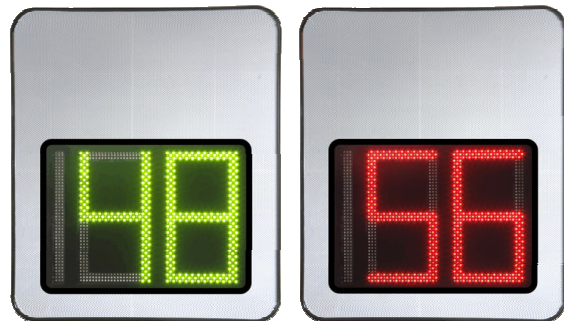
- Residential areas
- Work zones
- City entrances / Village gateways

Accident Sites

- Dangerous curves
- Bridges
- Tunnels

Vulnerable Road User Areas

- Hospitals
- School vicinities
- Near retirement homes
- Factory premises
- Bus stops
- University grounds



Product Features

Multiple Operating Modes

- Radar Mode displays real-time speed information
- Speed Limit Mode displays the posted speed
- Covert Mode measures speed but does not display to drivers
- Demo Mode for demonstrations and testing of display colour, brightness, and flashing

LED Display

- Display can flashing for additional warning
- Display is legible to drivers from 100 metres
- 13-segment LED digits provide better readability than more commonly used 7 segment LED displays
- Photocell controls the brightness of the display to match ambient light conditions

User Defined Range Settings

- Limit the highest speed displayed to prevent intentional speeding at the DFS
- Limit lowest shown speed so that pedestrians runners and bicycles are not detected

High Visibility Signface

- 3M™ Diamond Grade™ Reflective Sheeting on the surround increases sign visibility in all weather conditions and at night

Multiple Power Options

- Operate with mains power using power supply unit, e.g. for fixed installations
- Operate with one or two optional 12 volt, 17Ah batteries for temporary applications
- Operate with battery buffered mains power using optional charger in locations with part time mains power
- Operate with optional solar panel and batteries for semi-permanent installations

Multiple Communication Options

- USB cable links unit directly with local PC
- Bluetooth wireless link to PC or PDA
- Optional modem for long distance wireless data connection from the office (data SIM card supplied free of charge by 3M)

Text Message Notification (when equipped with a modem)

- Sends a text when battery voltage is low
- Sends a text when memory is almost full or full and old data about to be overwritten
- Sends a text when diagnostic check identifies a fault

Diagnostic Functions

- Diagnostic check verifies data memory integrity, supply voltage, radar operation, modem communication, Bluetooth communication etc.
- A self diagnostic check at startup, at midnight or on user demand
- Status of component

Speed Data Analysis

Easy downloading and speed data analysis

- Identify traffic volume and speed at a location
- Create tables and charts with just a few mouse clicks
- Produce before & after studies to evaluate what effect the DFS has on speed

Day and Time Scheduling

Set on/off time schedules by day of the week

- Tailor on times to coincide with periods of activity e.g. at school times, lunchtime pedestrian surges
- Prevent habituation of drivers
- Extend battery life

User friendly Design

- Lightweight design – sign can be installed by one person
- User friendly software interface
- Mounting box adapts to a range of post diameters (60 – 140 mm)
- Lockable mounting box provides vandal resistance for sign and accessories (modem, batteries, etc)

High Quality Standard

Trust in highest reliability

- Closed design ensures protection against humidity and dust (IP54)
- Self diagnostic functions allow quick verification of operability
- Text message notification (when used with modem) to inform of service needs
- Sign sets on hinge pins which makes it easy to install. When unlocked the sign swings open for service

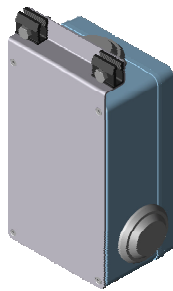
Included Components

The DFS 700 is delivered as plug-and-play device including built in radar, a mounting box, software, and cables to directly operate and install it.

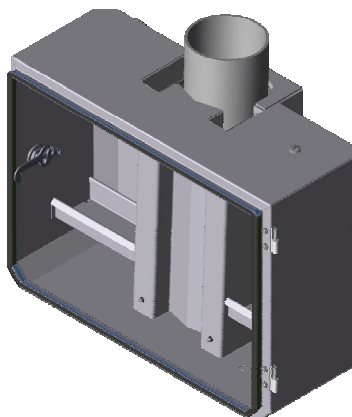
Components Supplied as standard



- CD with PC and PDA software and DFS 700 installation and user manual. Also a USB cable and a Bluetooth stick for PC USB port



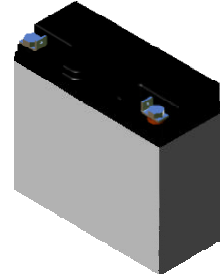
- Power supply unit for converting 240 Volt AC mains power to 12 Volt DC



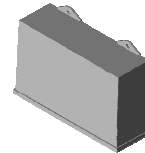
- Lockable mounting box which provides a secure area for batteries, modem. Adapts to post diameters of 60 to 140 mm

Optional Accessories

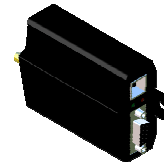
Additional accessories can be purchased separately to suit the specific needs of the customer and the application.



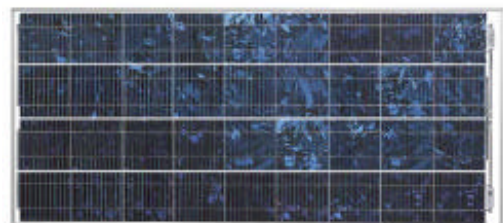
- 12 Volt 17 Ah lead-gel battery with cable and polarity protected connector. Up to two such batteries can be connected to a DFS 700



- Battery charger for recharging batteries from the mains supply or when DFS is installed where only part time power is supplied



- GSM/GPRS modem for remote communication over 900 and 1800 MHz GSM networks



- 80 Watt or 125 Watt solar panel for semi-permanent installations. A charge controller and bracket are also required. The 80 Watt panel should provide an 80% 'uptime' subject to traffic density, optimum positioning and the number of batteries utilised. The 125 Watt panel should provide 90%+ 'uptime'

Technical Data

Dimensions & Weight

660 × 770 × 110 mm (w × h × d), 8.5 kg

Operating Voltage

11.3 V – 15.0 V

Current (Power)

Standby 0.02 A (0.24W)

Radar mode w/o traffic (display inactive)

0.08 A (0.96 W)

Radar mode with traffic (display active, one

colour @ med brightness) 1.00 A (12 W)

Peak current (less than 1 second with all

components on) 5 A (60 W)

Power Supply Unit

Input 100 V – 240 V AC @ 50 – 60 Hz

Protection class 1

Output 12 V / 100 W

IP 55, ca. 2 kg

Battery Standby Time

Approx. 850 hours using one completely charged 12 Volt 17 Ah battery

Fuse

ATO Fuse 4A T

Cabinet Rating

IP 54

Cabinet Color

7042 RAL

Sign Face

White Diamond Grade™ reflective sheeting

Printable area 530 × 290 mm (w × h)

Operating Temperature Range

–35 to + 75 °C (DFS 700 internal temp.)

Humidity Range

Up to 95 %

Display

330 mm high, 450 mm wide

2 ½-digits (speed up to 199), 13 segments

LEDs

InGaAIP SMD LEDs, viewing angle 16 – 18°

3 rows green (570 nm), 3 rows red (635 nm)

Backup Battery

Lithium 3V CR2450, ca. 2 years lifetime

Data Memory

1 MB non-volatile flash memory

100,000 data entries

Radar Frequency

24.15 GHz – 24.25 GHz

Radar Power

20 dBm, 100 mW e.i.r.p.

Radar Speed Range and Accuracy

Measures from 2 mph to 120 mph (can be limited)

± 1.2 mph for speeds below 60 mph

± 2 % for speeds above 60 mph

Radar Detection Range

Approximately 100metres for average saloon car

Radar Beam Width

14° horizontal, 24° vertical

Bluetooth

Class 2 module, 4dBm transmission power, up to 20 m range

Interfaces

USB, Bluetooth, Charger input, Battery 1 input (charges when battery charger

connected), Battery 2 input, Power switch, RS-232 (for modem), modem power supply,

Switchgear for ext. devices, Grounding bolt

Switchgear

24 VAC / DC, 150 mA, connector type

Weidmüller BLZF 3.5/3/F SNOR

Firmware

Flashable

Software

DFS-CAS for Windows 2000/XP PC

DFS-CAS for Windows Mobile 5.0 PDA

Mounting Box / Battery Box

For 60 to 140 mm pole diameters, ca. 7.5 kg

GSM Modem*

Wavecom 900 MHz / 1800 MHz

(SIM card with Circuit Switched Data

Services provided with modem), ca. 0.25 kg

Batteries*

12 V, 17 Ah, ca. 6kg

Battery Charger*

100 V – 240 V AC @ 50 – 60 Hz

Protection class 2

Max output 12 V / 60 W

Temperature range - 40° to +40°

IP 67, ca. 1kg

* Optional accessories

EU Standards Compliance

Device	Standard (Directive / Council Recommendation)
DFS 700	EN 50293 (89/336/EEC EMC Directive) Electromagnetic compatibility - Road traffic signal systems - Product standard
DFS 700	EN 300 440-2 (99/5/EC R&TTE Directive) Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range devices; Radio equipment to be used in the 1 GHz to 40 GHz frequency range; Part 2:Harmonized EN under article 3.2 of the R&TTE Directive
DFS 700	EN 60950 / EN 60215 (73/23/EEC Low Voltage Directive) Safety of information technology equipment including electrical business equipment / Safety requirements for radio transmitting equipment
DFS 700 Radar Unit	EN 301 489-3 (99/5/EC R&TTE Directive) Electromagnetic compatibility and Radio spectrum Matters (ERM): Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 3: Specific conditions for Short-Range Devices (SRD) operating on frequencies between 9 kHz and 40 GHz EN 50392 (99/519/EC EMF Recommendation) Generic standard to demonstrate the compliance of electronic and electrical apparatus with the basic restrictions related to human exposure to electromagnetic fields (0 Hz - 300 GHz)
DFS Bluetooth Module	EN 301 489-17 (99/5/EC R&TTE Directive) Electromagnetic compatibility and Radio spectrum Matters (ERM): Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 17: Specific conditions for 2.4 GHz wideband transmission systems and 5 GHz high performance RLAN equipment EN 300 328 (99/5/EC R&TTE Directive) Electromagnetic compatibility and Radio spectrum Matters (ERM); Wideband Transmission systems; Data transmission equipment operating in the 2.4 GHz ISM band and using spread spectrum modulation techniques; Harmonized EN covering essential requirements under article 3.2 of R&TTE Directive EN 50392 (99/519/EC EMF Recommendation) Generic standard to demonstrate the compliance of electronic and electrical apparatus with the basic restrictions related to human exposure to electromagnetic fields (0 Hz - 300 GHz)
DFS 700 GSM Modem*	EN 301 489-7 (99/5/EC R&TTE Directive) Electromagnetic compatibility and Radio spectrum Matters (ERM): Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 7: Specific conditions for mobile and portable radio and ancillary equipment of digital cellular radio telecommunications systems (GSM and DCS) EN 301 511 (99/5/EC R&TTE Directive) Global System for Mobile communications (GSM); Harmonized standard for mobile stations in the GSM 900 and DCS 1800 bands covering essential requirements under article 3.2 of the R&TTE directive (1999/5/EC) EN 50392 (99/519/EC EMF Recommendation) Generic standard to demonstrate the compliance of electronic and electrical apparatus with the basic restrictions related to human exposure to electromagnetic fields (0 Hz - 300 GHz)

99/5/EC R&TTE Directive

Directive of 9 March 1999 of the European Parliament and of the Council on Radio Equipment and Telecommunications Terminal Equipment and the mutual recognition of their conformity

89/336/EEC EMC Directive

Council Directive of 3 May 1989 on the approximation of the laws of the Member States relating to electromagnetic compatibility

73/23/EEC Low Voltage Directive

Council Directive of 19 February 1973 on the harmonization of the laws of Member States relating to Electrical Equipment designed for use within certain voltage limits

99/519/EC EMF Recommendation

Council Recommendation of 12 July 1999 on the limitation of exposure of the general public to electromagnetic fields (0 Hz to 300GHz)

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