



# DSEM835

## PROGRAMMABLE DISPLAY FOR USE IN VEHICLES AND OFF-HIGHWAY MACHINERY



### KEY FEATURES / SUMMARY

- Robust HMI/programmable display specifically designed for mobile applications
- Optically bonded 3.5" colour screen for harsh environments
- Auto on / off heated display for use in low temperatures
- Powerful processor with Cortex M7 400 MHz clock speed
- 512 KB of SDRAM and 8 MB of flash storage
- 4 configurable inputs, digital and analogue capability
- 3 configurable digital outputs
- 1 VREF output (to power sensors)
- CAN interfaces, J1939 and Raw CAN
- PCAN interface for programming
- Flexible user programming via CODESYS 3.5
- IP67 protection / NEMA 6

### ADDITIONAL HARDWARE

Deutsch connector A, 18 way complete with pins  
 E050 connector harness  
 E050 configuration harness  
 PCAN USB PC configuration interface

### DSE PART

007-850  
 016-177  
 016-176  
 016-179

### OVERVIEW

#### DC SUPPLY

8 V DC to 32 V DC

#### CURRENT CONSUMPTION

**OPERATING CURRENT**  
 < 1000 mA at 12 V and 24 V without external loads

#### DISPLAY

320 px x 240 px  
 24 bit colour  
 Optically bonded

#### INPUTS (4)

**CONFIGURABLE INPUTS 1 to 4**  
 Configurable as: digital, current, voltage, resistance  
 0 V to 10 V  
 0 mA to 20 mA  
 0-3 kΩ

#### OUTPUTS (3)

**DC OUTPUTS 1 to 3**  
 1 A continuous at supply voltage

#### VREF OUT

100 mA at 10 V / 5 V

#### INTERFACES

**CAN 1**  
 CAN Interface 2.0 A/B, ISO11898  
 50 kbits/s... 1 Mbit/s  
 SAE J1939 or Raw CAN  
 Configurable internal software 120 Ω resistor

#### DIMENSIONS

**OVERALL (W x H x D)**  
 112.5 mm x 115 mm x 49 mm  
 4.43" x 4.53" x 1.93"

**PANEL CUT-OUT**  
 80 mm / 3.15" Diameter

**TORQUE SETTING**  
 8 Nm / 5.9 ft-lb

#### WEIGHT

< 1 kg

#### STORAGE TEMPERATURE RANGE

-40 ° C to +85 ° C  
 -40 ° F to +185 ° F

#### HEATED DISPLAY OPERATING RANGE

Turns on at -25 ° C / -13 ° F  
 Turns off at -5 ° C / 23 ° F

#### OPERATING TEMPERATURE RANGE

-40 ° C to +85 ° C  
 -40 ° F to +185 ° F

#### PROTECTION RATING

IP67 / NEMA 6 (with mating connectors)

### RELATED MATERIALS

#### TITLE

M835 Operators Manual  
 M835 Installation Instructions

#### PART NO.

057-313  
 053-250

#### DEEP SEA ELECTRONICS LTD UK

Highfield House, Hunmanby Industrial Estate, Hunmanby YO14 0PH  
**TELEPHONE** +44 (0) 1723 890099 **FACSIMILE** +44 (0) 1723 893303  
**EMAIL** sales@deepseaelectronics.com **WEBSITE** www.deepseaelectronics.com

#### DEEP SEA ELECTRONICS INC USA

3230 Williams Avenue, Rockford, IL 61101-2668 USA  
**TELEPHONE** +1 (815) 316 8706 **FACSIMILE** +1 (815) 316 8708  
**EMAIL** usasales@deepseaelectronics.com **WEBSITE** www.deepseaelectronics.com

**Technical Data****DSEM835**

<b>Supply</b>		<b>Connector A</b>
Operating voltage	8 V DC to 32 V DC	Pin 7
Unit power supply maximum current consumption, full backlight (no external loads)	< 1000 mA at 12 V and 24 V	
<b>Fusing</b>		<b>Connector A</b>
Unit power supply external protection fuse rating	3 A	Pin 7
<b>Housing</b>		
PC PBT alloy plastic resin		
<b>Dimensions</b>		
Overall (W x H x D) 112.5 mm x 115 mm x 49 mm (4.43" x 4.53" x 1.93")		
<b>Weight</b>		
< 1 kg		
<b>Temperature</b>		
Operating temperature	-40 °C to +85 °C / -40 °F to +185 °F	
Storage temperature	-40 °C to +85 °C / -40 °F to +185 °F	
<b>Protection Rating</b>		
	IP67 (mating connectors)	
	NEMA 6 (mating connectors)	
<b>Display</b>		
Resolution, pixel	320 px x 240 px	
Colour	24 bit	
Format	3.5" diagonal	
Mounting	Optically bonded	
Illumination	LED (lifetime > 30,000 hrs)	
<b>Connectors</b>		
Connector A	18 pin TE connectivity DT16-18SA-K004	
<b>Digital Inputs</b>		<b>Connector A</b>
Digital inputs configured high or low		Pin 5, 6, 12, 18
High level voltage threshold	Configurable	
Low level voltage threshold	Configurable	
<b>Analogue Voltage Inputs</b>		<b>Connector A</b>
0 V to 5 V programmable voltage range	0 V to 5 V	Pin 5, 6, 12, 18
0 V to 10 V programmable voltage range	0 V to 10 V	
0 V to 32 V programmable voltage range	0 V to 32 V	
Voltage measurement resolution	12 bits	
Voltage measurement accuracy	± 1% FSD	
Voltage measurement input resistance	≥ 7.5 kΩ	
Voltage measurement sampling rate	500 Hz	
<i>FSD = Full Scale Deflection</i>		



## DSEM835

Analogue Current Inputs		Connector A
Current measurement direction	Current sink only	Pin 5, 6, 12, 18
Current measurement ranges	0 mA to 20 mA	
	4 mA to 20 mA	
Current measurement resolution	12 bits	
Current measurement accuracy	± 1% FSD	
Current measurement input sink resistance	150 Ω ± 1%	
Current measurement sampling rate	500 Hz	
<i>FSD = Full Scale Deflection</i>		
Analogue Resistive Inputs		Connector A
Resistance measurement range	0 Ω to 3200 Ω	Pin 5, 6, 12, 18
Resistance measurement source voltage	12 V maximum	
Resistance measurement current	3 mA	
Resistance measurement resolution	12 bits	
Resistance measurement accuracy	± 1% FSD	
Resistance measurement sampling rate	500 Hz	
<i>FSD = Full Scale Deflection</i>		
Digital Outputs High Side		Connector A
Switching current	1 A	Pin 14, 15, 16
Digital output active high 'ON' state internal voltage drop at rated current	< 100 mV	
Digital output active high 'OFF' state leakage current	< 120 µA at 24 V	
Reference Voltage		Connector A
Reference voltage output	Programmable 5 V or 10 V, 100 mA accuracy ±5%	17
		VRef GND Pin 13
CAN Interfaces		Connector A
Number of CAN ports	1	Pin 2, 3, 4 / 8, 9, 10
Supported protocols	J1939	
	Raw CAN	
Supported programmable baud rates	50 kbit/s, 125 kbit/s, 250 kbit/s, 500 kbit/s, 800 Mbit/s, 1 Mbit/s	Programmable using PCAN Interface
Processor		
STM 32h743	Cortex ARM M7	
	400 MHz	
Memory		
Flash	8 MB	
RAM	512 KB	
Non Volatile	16 KB	



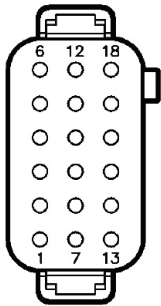
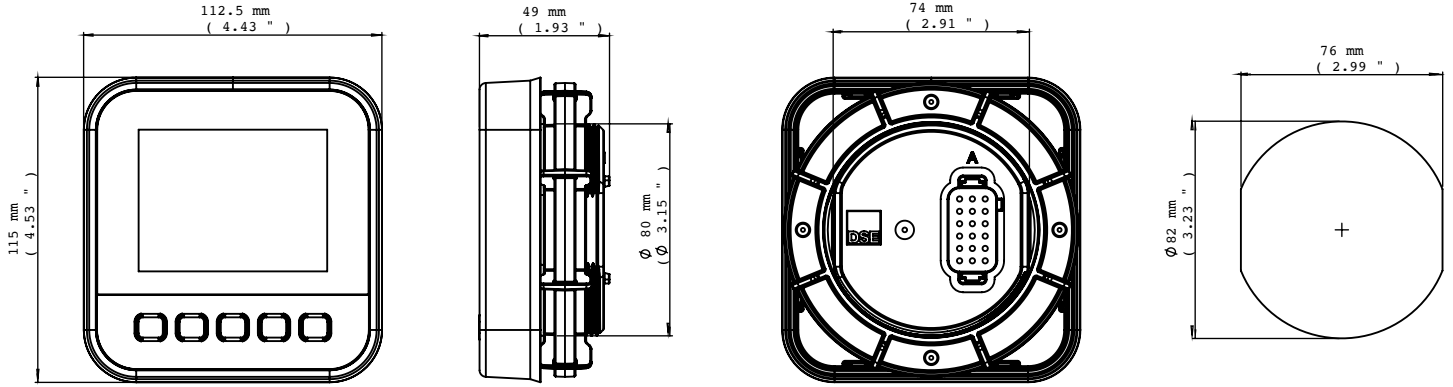
DSEM835

Environmental and Testing		
Electro Magnetic Compatibility	Noise immunity Emission standard Road vehicles Road vehicles - electrical disturbances from conduction and coupling. Part 3: Electrical transient transmission by capacitive and inductive coupling via lines other than supply lines	BS EN 6100-6-2 BS EN 6100-6-4 ISO 11452 ISO 7637-3: 2016
Electrical Safety	Safety requirements for electrical equipment for measurement, control & laboratory use Part 1: General requirements Part 2-030: Particular requirements for testing measuring circuits	BS EN 61010 BS EN 61010:2010 BS EN 61010-2-30: 2010
Electrical tests	Road vehicles - environmental conditions and testing for electrical & electronic equipment Part 2: Electrical loads 4.6.3 Starting profile 4.6.4 Load dump	ISO 16750-2: 2012
Climatic tests	Damp heat, cyclic upper temperature 55°C, number Damp heat, steady state test temperature 40 °C / 93% RH	EN 60068-2-30 EN 60068-2-78
Mechanical tests	Part 2-6: Tests - Test Fc: Vibration (sinusoidal) Part 2-27: Tests - Test Ea: Shock	EN 60068-2-6 EN 60068-2-27
Temperature	Ab / Ae cold test -40 °C (-40 ° F) Bb / Be dry heat +85 °C (185 ° F)	
Chemical	Chemical testing for electrical and electronic equipment - road vehicles	ISO 16750-5
Degrees of protection provided by enclosures	IP67 / NEMA 6	BS EN 60529



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### Connector A

PIN	DESCRIPTION
1	GND
2	CAN Screen
3	CAN L In
4	CAN H In
5	Input 4
6	Input 1
7	VDC Batt +
8	CAN Screen
9	CAN L Out
10	CAN H Out
11	GND
12	Input 2
13	GND Batt
14	Output 1
15	Output 2
16	Output 3
17	VREF Out
18	Input 3

Abbreviations  
OUT H, L  
AIN  
A GND

Output can be configured as digital high-side or digital low-side  
Input can be configured to accept signals from positive digital, negative digital, 0 V to 10 V, 4mA to 20 mA, ratiometric, resistive or frequency  
Ground connection for the analogue input channels