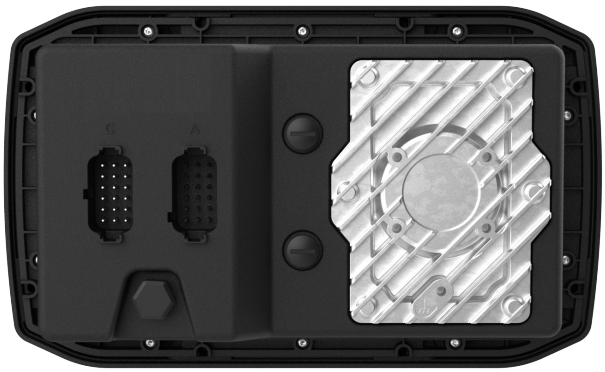
DSE**Control**® Data Sheet

DSE**M870** – 7” Programmable Display

Part Numbers: M870-01, M870-02, M870-03

Portrait or **Landscape**





Overview

The DSE**M870** is a 7” programmable display designed for use on vehicles and off highway machinery. Developed for use as a standalone product or with the DSE**M640** programmable controller, the DSE**M870** provides users with outstanding flexibility.

The DSE**M870** is configured using CODESYS 3.5 (M870-01 / M870-02 / M870-03)

Key Features

- Robust HMI/programmable display specifically designed for mobile applications
- Optically bonded 7” colour screen for harsh environments
- Capacitive touchscreen (M870-02 variant)
- Powerful ARM Cortex A9 processor with 800 MHz clock speed
- 512 MB of DDR3 SDRAM and 2 GB of NAND mass storage
- 4 configurable inputs, 4 configurable digital outputs
- Supports landscape and portrait orientation
- 2 independent CAN interfaces, J1939, CANopen and Raw CAN
- Ethernet interface for communication
- Flexible user programming via CODESYS 3.5
- IP67 protection/NEMA 6
- 2 camera inputs

Product Variants

M870-01 - CODESYS (Keyed)
M870-02 - CODESYS (Keyed & Touchscreen with WebVisu)
M870-03 - CODESYS (Keyed with WebVisu)

Product Approvals
+ CE
+ UL Listed: UL Standard - 6200:2019
+ E11: Approval Number - E11*10R06/02*11025*03

Product Documentation

057-246 – DSE**M870** Installation and Operator Manual
057-320 - DSE**M870** CODESYS Software Manual

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DSEM870 – 7” Programmable Display

Part Numbers: M870-01, M870-02, M870-03



Portrait or **Landscape**

Specifications	
DC Supply	
Continuous Voltage Rating	8 V DC to 32 V DC continuous
Maximum Operating Current	< 1000 mA at 12 V and 24 V without external loads < 1500 mA at 12 V and 24 V with Htr
Display	
Measurement	800 x 480 resolution 24 bit colour. Optically bonded.
Brightness	500 cd/m² (nit)
Inputs	
Quantity	4
Type	Voltage 0 V to 5 V, 0 V to 10 V, 0 V to 32 V Current 0 mA to 20 mA Ratiometric Resistive 0 Ω to 3 kΩ Frequency 5 Hz to 30 kHz Digital Positive / Negative
Outputs	
Quantity	4
Type	Digital - High side / low side
Processor	
Type	ARM Cortex a9
Speed	800 MHz Clock Speed
NAND Mass Storage	2 GB
RAM	512 MB
Analogue Camera	
Number	2
Type	Composite (CVBS) PAL / NTSC

Product Documentation

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DSE**M870** – 7” Programmable Display

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Portrait or **Landscape**

Specifications	
Interfaces / Communications	
CAN 1 and 2	CAN Interfaces 2.0 A/B, ISO11898 50 kbits/s... 1 Mbit/s CANopen, SAE J1939 or Raw CAN
Ethernet	10 Mbit/s / 100 Mbit/s Duplex CODESYS Modbus TCP Client
USB	USB 2.0 host (480 Mbit/s)
Temperature	
Operating Temperature	-30 ˚C to +85 ˚C / -22 ˚F to + 185 ˚F
Storage Temperature	-40 ˚C to +85 ˚C / -40 ˚F to +185 ˚F
Dimensions	
Overall (W x H x D) with buttons	272 mm x 165 mm x 81 mm / 10.7” x 6.5” x 3.2” (W x H x D)
Panel Cut-Out (W x H)	231 mm x 133 mm (R 12 mm) / 9.1” x 5.24” (R 0.5”)
Weight	1.25 kg 2.76 lb
Maximum Panel Thickness	6 mm / 0.2”
RAM Mountable	AMPS Hole Pattern

Related Products		
Programmable Controllers		
DSEM643	Programmable Controller (34 I/O)	M643-01
DSEM640	Programmable Controller (68 I/O)	M640-01
Expansion Devices		
DSE2170	CAN RTD / Thermocouple / Analogue Output Expansion Module	2170-01
DSE2160	CAN Input / Output Expansion Module	2160-01
Accessories		
DSEM870 Wiring Harness 1.2 m		016-167
DSEM870 Connector A Set (including pins)		007-850
DSEM870 Connector C Set (including pins)		007-851
Ethernet Cable		016-160
USB Cable		016-161

Product Documentation

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DSEM870 – 7” Programmable Display

Part Numbers: M870-01, M870-02, M870-03

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Environmental Testing Standards	
CE Marking	
EN 61000-6-2	Electromagnetic compatibility (EMC) noise immunity
EN 61000-6-4	Electromagnetic compatibility (EMC) emission standard
BS EN 61010-1	Safety requirements for electrical equipment for measurement, control and laboratory use
E Marking	
UN/ECE-R10.05	E11
Water and Dust	
IEC 60529	IP67 / NEMA6
Salt Spray	
BS EN 60068-2-52	Test Kb - Salt Mist Cyclic (Sodium Chloride Solution) Severity 3 One test cycle consisting of: Salt mist temperature: +15 ˚C to +35 ˚C Spray period: 2 hours Followed by humidity storage period: 20 hours to 22 hours at 93 + 2 % to 3 % rh and +40 ˚C ± 2 ˚C Four test cycles (as above) to be applied followed by a Storage Period: 3 days @ 45 % to 55 % rh and +23 °C ± 2 °C
Mechanical Tests	
EN 60068-2-6	Vibration Resonance Search Freq range: 10 Hz to 2 kHz Acceleration: 10 g
EN 60068-2-64	Vibration Random Freq range: 10 Hz to 350 Hz
ISO 16750-3	Test VII; Commercial vehicle, sprung masses Random vibration Mounting location; vehicle body
EN 60068-2-27	Mechanical Shock: Operational Shock Pulse Shape: Half Sine Amplitude: 50 g Duration: 11 ms Number of Shocks: 3 in each direction of each axis (9 in total of each duration)
EN 60068-2-27	Mechanical Shock Amplitude: 50 g Duration: 6 ms
ISO 16750-3	Bumps Amplitude: 30 g Duration: 6 ms; 24,000 shocks
Load Dump	
ISO 7637-2	151 V (Ri 1 Ω) 202 V (Ri 8 Ω)

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DSEM870 – 7” Programmable Display

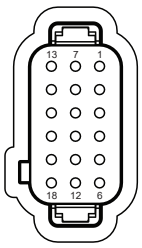
Part Numbers: M870-01, M870-02, M870-03

Portrait or Landscape

Connector A	
Pin	**Description**
1	ECU Supply GND
2	CAN1 SCR
3	CAN2 SCR
4	No Connection
5	Camera 1 SCR
6	Camera 2 SCR
7	ECU Supply +VE
8	CAN1 H
9	CAN2 H
10	No Connection
11	Camera 1 Signal
12	Camera 2 Signal
13	Ignition +VE (15)
14	CAN1 L
15	CAN2 L
16	No Connection
17	No Connection
18	No Connection

Connector Diagrams

Connector A



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DSEM870 – 7” Programmable Display

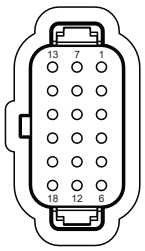
Part Numbers: M870-01, M870-02, M870-03

Portrait or Landscape

Connector C			
Pin	**Description**	**Comments**	**Switching Current**
1		Input / Output Supply +VE	
2	QC001	OUT H, L	2 A
3	QC002	OUT H, L	2 A
4	QC003	OUT H, L	2 A
5	QC004	OUT H, L	2 A
6		Input +ve ref	
7		Output Supply GND	
8		No Connection	
9		No Connection	
10		No Connection	
11		No Connection	
12		VREF Out -ve	
13		VREF Out +ve	100 mA
14	IC001	AIN, DIN H, L, FREQ	
15	IC002	AIN, DIN H, L, FREQ	
16	IC003	AIN, DIN H, L, FREQ	
17	IC004	AIN, DIN H, L, FREQ	
18		Input GND ref	

Connector Diagrams

Connector C



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DSEM870 – 7” Programmable Display

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Ethernet - M12 ‘D’ Coded	
Pin	**Description**
1	Tx+
2	Rx+
3	Tx-
4	Rx-

USB Host	
Pin	**Description**
1	+5 V DC
2	Data -
3	Data +
4	0 V
5	Shield

Connector Diagrams

Ethernet



USB Host



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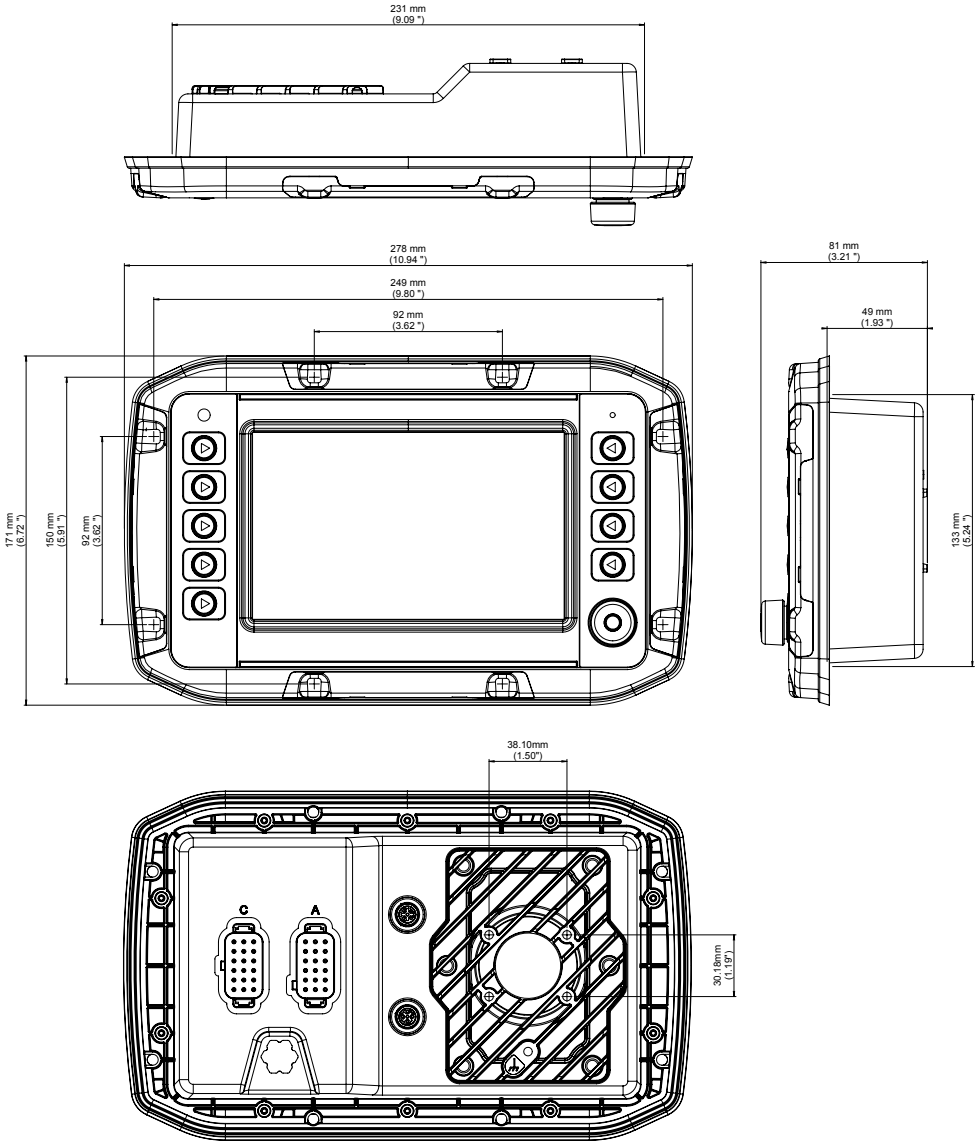
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Technical Drawing



Product Documentation

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057-320 - DSE**M870** CODESYS Software Manual

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