

ehb SMARTdisplay 840

PROGRAMMABLE DISPLAY FOR USE IN
VEHICLES AND OFF-HIGHWAY MACHINERY

ehb5497



KEY FEATURES / SUMMARY

- Robust HMI/programmable display specifically designed for mobile applications
- Optically bonded 4.3" colour screen for harsh environments
- Powerful Cortex M7 400 MHz clock speed + M4 200 MHz clock speed
- 64 MB of SDRAM / 20 MB CODESYS Application / 20 MB User Data
- 8 KB retained data
- 4 configurable inputs, digital and analogue capability
- 4 configurable digital outputs
- 2 independent CAN interfaces, J1939, CANopen and Raw CAN
- Ethernet interface for communication
- Flexible user programming via CODESYS 3.5
- IP67 protection

ADDITIONAL HARDWARE

ehb SMARTdisplay 840 connector harness
Ethernet programming cable
M12 to USB cable
Deutsch Connector A, 18-pin compl. with pins / Plug set for self-assembly

PART

ehb2401
M11350
M11351

ZUB0004

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

480 px x 272 px
24 bit colour
Optically bonded

INPUTS/OUTPUTS (total)

4 inputs / 4 outputs

INPUTS

Configurable,
Digital inputs (positive / negative)
Analogue inputs (Voltage 0 V to 5 V, 0 V to 10 V, 0 V to 32 V, current 4 mA to 20 mA, Ratiometric, Resistive, Frequency)

OUTPUTS

Configurable
Digital Output High-Sided/Low-Sided

INTERFACES

CAN 1.2

CAN Interfaces 2.0B, ISO11898
50 kbits/s... 1 Mbit/s
CANopen, SAE J1939 or Raw CAN

ETHERNET

10/100 Mbit/s

USB

USB Host 2.0 (12 Mbit/s)

DIMENSIONS

131 mm x 208 mm x 56 mm (H x W x D)

WEIGHT

< 1 kg

STORAGE TEMPERATURE RANGE

-40 ° C to +80 ° C

OPERATING TEMPERATURE RANGE

-30 ° C to +70 ° C

PROTECTION RATING

IP67 (with mating connectors)

MOUNTING

4 x M5 bolts / RAM arm

RELATED MATERIALS

ehb SMARTdisplay 840 Installation Instructions
ehb SMARTdisplay 840 Operators Manual

ehb electronics gmbh

Hans Böckler-Straße 20, 30851 Langenhagen, Germany

TELEPHONE +49 (0) 511 / 123207 - 0

EMAIL info@ehb-electronics.de WEBSITE www.ehb-electronics.de / www.ehbshop.de

Technical Data
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Supply		Connector A
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	
Unit power supply current consumption after controlled shutdown has occurred due to the ignition being turned off	< 5 mA at 24 V	
Fusing		Connector A
Unit power supply external protection fuse rating	3 A	Pin 7
High current outputs supply input external fuse protection rating (i.e. sum of output currents from all outputs provided for by an individual supply to external fuse rating in total)	10 A	Pin 7
Housing		
PC PBT alloy plastic resin		
Dimensions		
H x W x D	131 x 208 x 56 mm	
Weight		
	< 1 kg	
Temperature		
Operating temperature	-30 °C to +70 °C	
Storage temperature	-40 °C to +80 °C	
Protection Rating		
	IP67 (mating connectors)	

Display		
Resolution, pixel	480 px x 272 px	
Colour	24 bit	
Format	4.3" diagonal	
Mounting	Optically bonded	
Illumination	LED (lifetime > 50.000 hrs)	
Connectors		
Connector A	18 pin DT16-18SA-K004	
Ethernet	M12, D-coded 4 pole socket	
USB	M12, B-coded 5 pole socket	
Digital Inputs		Connector A
Digital inputs configured high or low		Pin 10, 11, 16, 17
High level voltage threshold	> 6 V	
Low level voltage threshold	< 2 V	
Analogue Voltage Inputs		Connector A
0 V to 5 V programmable voltage range	0 V to 5 V	Pin 10, 11, 16, 17
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	≥ 30 kΩ	
Voltage measurement sampling rate	500 Hz	
<i>FSD = Full Scale Deflection</i>		

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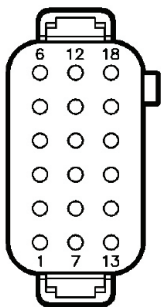
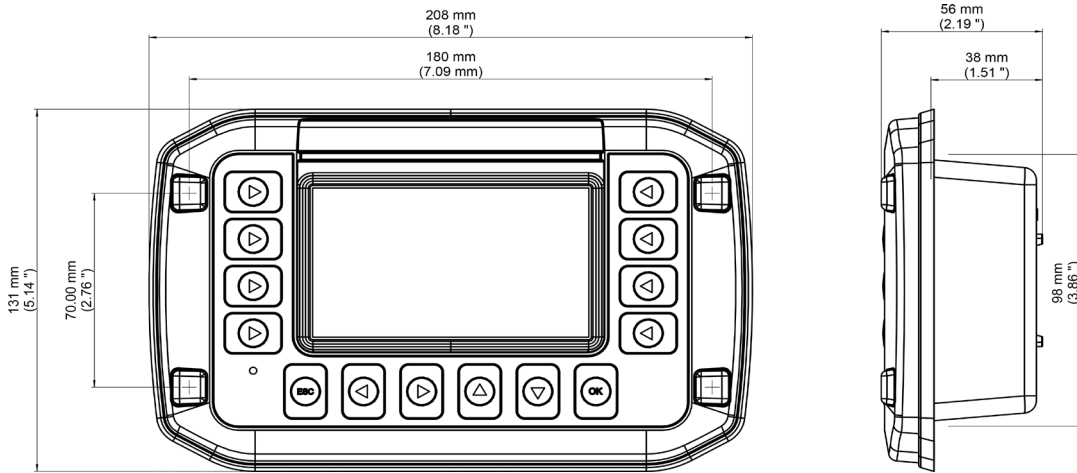
Analogue Current Inputs		Connector A
Current measurement direction	Current sink only	Pin 10, 11, 16, 17
Current measurement ranges	0 mA to 20 mA	
	4 mA to 20 mA	
Current measurement resolution	12 bits	
Current measurement accuracy	± 1% FSD	
Current measurement input sink resistance	150 Ω ± 1%	
Current 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 10, 11, 16, 17
Resistance measurement source voltage	12 V maximum	
Resistance measurement current	1 mA	
Resistance measurement resolution	12 bits	
Resistance measurement accuracy	± 1% FSD	
Resistance measurement sampling rate	500 Hz	
<i>FSD = Full Scale Deflection</i>		
Analogue Ratiometric Inputs		Connector A
Voltage ratiometric measurement voltage range		Pin 10, 11, 16, 17
Voltage ratiometric measurement Vref	Supply/Vref	
Voltage ratiometric measurement	Ratio of input pin to supply voltage	
Voltage ratiometric measurement accuracy	± 1% FSD	
<i>FSD = Full Scale Deflection</i>		
Frequency Inputs		Connector A
Frequency range	5 Hz to 30 KHz	Pin 10, 11, 16, 17
Resolution	100 Hz at max. freq	
Accuracy	400 Hz at max. freq	
Maximum space voltage	< 0,9 V	
Minimum mark voltage	> 2,4 V	
Digital Outputs High Side		Connector A
Switching current	1 A	Pin 2, 3, 4, 5
Digital output active high 'ON' state internal voltage drop at rated current	< 1500 mV	
Digital output active high 'OFF' state leakage current	< 10 µA at 24 V	
Digital Outputs Low Side		Connector A
Switching current	1 A	Pin 2, 3, 4, 5
Digital output active low 'ON' state maximum voltage at rated current	< 500 mV	
Digital output active low 'OFF' state leakage current	< 2 mA at 24 V	
Reference Voltage		Connector A
Reference voltage output	Programmable 5 V or 10 V, 100 mA accuracy ±5%	6
		VRef GND Pin 18
Auxiliary Voltage		Connector A
8 V - 32 V ignition input	max 150 mA	Pin 13

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RTC		
Real time clock	Standard RTC, backup time ~ 5 years	
Camera		
Analogue video input (supported video standards: PAL and NTSC)	1	Connector A 12,18
CAN Interfaces		
Number of CAN ports	2	Connector A Pin 8, 9, 14, 15
Supported protocols	J1939	
	CANopen	
	Raw CAN	
Supported programmable baud rates	50 kbit/s, 125 kbit/s, 250 kbit/s, 500 kbit/s, 800 Mbit/s, 1 Mbit/s	
Ethernet Interface		
Number of Ethernet ports	1	M12, 4 pole D-coded 4 pole socket
Supported data rates	10/100 Mbit/s	
Supported protocols	Modbus TCP	
USB Interface		
Number of USB host ports	1	M12, 5 pole B-coded, 5 pole socket
Supported USB version	2.0	
Speeds supported	Full speed (12 Mbit/s)	
Device class supported	08 (Mass Storage)	
Supported filing system	FAT32	
Processor		
	STM32H745	
Clock frequency	M7 400 MHz + M4 200 MHz	
Memory		
Flash	32 MB / 20 MB CODESYS - 20 MB User Data - 2 MB CODESYS Log - 8 KB retained data	RAM 64 MB
LED		
A status LED to indicate internal states and errors		
Colour	Red, amber, green	
Environmental and Testing		
CE marking	Electromagnetic compatibility (EMC) noise immunity Electromagnetic compatibility (EMC) emission standard	ISO 13766-1
Electrical tests	Pulse 1, severity level: IV; function state C Pulse 2a, severity level: IV; function state B Pulse 2b, severity level: IV; function state C Pulse 3a, severity level: IV; function state A Pulse 3b, severity level: IV; function state A Pulse 4, severity level: IV; function state B Pulse 5a, severity level: III; function state C	ISO 7637-2
Climatic tests	Damp heat, cyclic upper temperature 55°C, number Damp heat, steady state test temperature 40 °C / 93% RH Test duration: 21 days Salt spray test severity level 3 (vehicle)	EN 60068-2-30 EN 60068-2-78 EN 60068-2-53
Mechanical tests	Test VII; vibration, random mounting location: vehicle body Vibration, sinusoidal 2000 Hz: 0,73 mm / 10g: 10 cycles/axis Bumps 30 g / 6 ms; 24.000 shocks	ISO 16750-3 EN 60068-2-6 ISO 16750-3

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Connector A

PIN	DESCRIPTION
1	ECU Supply GND
2	DOUT 2
3	DOUT 1
4	DOUT 4
5	DOUT 3
6	VREF OUT
7	Battery
8	CAN1 H
9	CAN 2 H
10	AIN 1
11	AIN 2
12	Camera 1
13	Ignition
14	CAN1 L
15	CAN2 L
16	AIN 3
17	AIN 4
18	Camera 1 GND

Ethernet

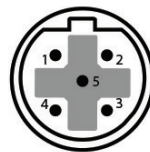
M12 "D" coded - 4 pin female



Pin - 01	TX+
Pin - 02	RC+
Pin - 03	TX-
Pin - 04	RC-

USB Host

M12 'B' coded - 5 pin female



Pin -01	5 V
Pin - 02	Data+
Pin - 03	Data-
Pin - 04	0 V
Pin - 05	Shield