

Emtron ED10M Datasheet

Datasheet
Rev 1.0



EMtron
Australia

DISPLAY UNIT

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1.0 General

Power Supply

- Operating voltage: 7.20V to 20.0V DC
- Operating current: 800 mA at 14.0V 50% Backlight Duty Cycle(excluding sensor and load currents)
- Reverse battery protection

Operating Temperature

- Max operating range: -30 to 85°C (-22 to 230°F)

Physical

- Aluminium 6061 grade CNC billet enclosure
- Enclosure size 284 X 140mm
- Weight: xxx
- Connector system: 55 Pin Circular Mil Spec Series III Connector
 - Pin diameter: 1 mm
 - Current rating: maximum 5.0A per pin at 22AWG

Internal: Specification of the SoM

- NXP® i.MX 8M Plus Quad Core
- 4 x Arm Cortex A-53
- 1 x Arm Cortex-M7 CPU 1.8GHz Core
- Arm Cortex M4 170MHz Microcontroller
- eMMC 32GB + 32GB external = 64GB total storage
- Gigabit Ethernet
- On-Board 6-axis IMU with 3-axis accelerometer and 3-axis gyroscope

2.0 Main Features

- 10.3 inch TFT Screen – 1920 * 768 Resolution
- Anti Glare / Scratch Resistant Optical Bonded Glass
- 16x High Intensity RGB LEDs
- High Speed Gigabit Ethernet 1000Mbps
- High Speed Logging (Up to 2000Hz)
- eMMC 64GB On-board logging memory
- Real-Time clock for datalogging
- 3-axis Accelerometer and 3-axis Gyroscope
- 4x CAN Bus
- 4x Video Input
- Headphone LR Output
- Mic LR Input
- 8 x Analog External 0.0 -5.0V Inputs (see Pinout)
- Selectable CAN 120 Ohm Termination

3.0 Analog Audio

- High quality 24-bit stereo audio codec with built-in stereo headphone amplifier
- Left and Right Mic Inputs
- Left and Right Speaker Outputs

4.0 Analog Inputs

8x Analog Voltage

- Accepts a 0.0 - 5.0V Analog input. Resolution is 1.22mV (12-Bit)
- Selectable 1k Ohm pull-up resistor to 5V Sensor Supply on ANV1 – ANV4
- Selectable Range control on ANV5 – ANV8; 0.0- 5.0V or 0.0 - 15.6V
- Input Impedance 100k Ohms to ground
- Sample Rate 2000Hz

5.0 Frequency Inputs

4x Frequency Inputs

- Tolerant of inputs signals -50.0V to 50.0V
- Accepts Magnetic and Hall effect signals.
- User adjustable trigger thresholds from -10.0V to 10.0V with 0.25V built in hysteresis.
- Range 0.1Hz up to 20,000.0Hz, Resolution. 0.1Hz
- Input Impedance 100k Ohms to ground
- Selectable 4k7 Ohm pull-up resistor to 8.5V

6.0 Analog Video Inputs

- Accepts Analog baseband video signals.
- 4x Composite Inputs OR 2x S-Video Inputs

7.0 Communications

- 1x High Speed Gigabit Ethernet 1000Mbps IPv6
 - Auto IP Config
- 4x CAN 2.0B
 - ESD Protection
 - Selectable 120 Ohm Termination Resistors
- 1 x RS232
- 1 x Lin Bus
- 1 x USB C
- 1 x Wi-Fi IEEE 802.11 ac/a/b/g/n Dual-Band (2.4/5 GHz)
- 1 x Bluetooth 5/BLE

8.0 Infield firmware update

Full In-field firmware updatable over Ethernet using the Emtron Display Setup Tool

9.0 Voltage and Ground Supplies

1x 14V Supply Input

- 5.0A Max (pin limited)
- 7.2V - 20.0V Range
- Supplies Device power

1x Backup Supply Input

- 5.0A Max (pin limited)
- 7.2V - 20.0V Range
- Supplies device power during shutdown

3x 5.0V Sensor Supply

- 5V Sensor Supply, Output current 400mA
- Accuracy: +/- 0.8% at 25 °C
- Short circuit, Reverse Battery Protection, Thermal overload protection
- Operating temperature range -40°C ~ 85°C

1x 12.0V Regulated Output

- 12V Regulated Supply, Output current 700mA
- Accuracy: +/- 1.0% at 25 °C
- Short circuit, Reverse Battery Protection, Thermal overload protection
- Operating temperature range -40°C ~ 85°C

1x Main Ground

- 5.0 A pin Limited

2x Analog Input 0V Reference

- Analog Sensor 0V Reference with short to battery protection

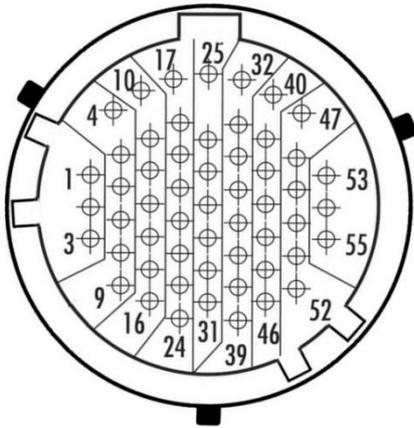
1x Speed 0V Reference

- Speed Sensor 0V Reference with short to battery protection

10.0 ED10M Pinout

Connector 8D0C17Z35PN

(5.0A continuous current. Shell size 17, 55 Pin, 22 AWG)



Looking into Connector

Mating Connector 8DA5-17Z35SN

Pin	Channel Name	Pin	Channel Name
1	14V Switched Supply	29	CAN 3 Low
2	Ground	30	CAN 4 High
3	Gigabit Ethernet Shield	31	CAN 4 Low
4	12V Regulated Output	32	Analog Input Channel 5
5	14V Backup Supply	33	Analog Input Channel 6
6	Gigabit Ethernet +Tx/Rx Pair 1	34	Analog Input Channel 7
7	Gigabit Ethernet -Tx/Rx Pair 1	35	Analog Input Channel 8
8	Gigabit Ethernet +Tx/Rx Pair 3	36	Headphone LH
9	Gigabit Ethernet -Tx/Rx Pair 3	37	Headphone RH
10	Sensor Supply: 5.0V	38	Mic Input LH
11	Sensor Supply: 5.0V	39	Mic Input RH
12	Sensor Supply: 5.0V	40	RS232 Transmit Output
13	Gigabit Ethernet +Tx/Rx Pair 2	41	RS232 Receive Input
14	Gigabit Ethernet -Tx/Rx Pair 2	42	RS232 0V Reference
15	Gigabit Ethernet +Tx/Rx Pair 4	43	Video Input 1
16	Gigabit Ethernet -Tx/Rx Pair 4	44	Video Input 2
17	Analog Input Channel 1	45	Video Input 3
18	Analog Input Channel 2	46	Mic 0V Reference
19	Analog Input Channel 3	47	Speed Input 1
20	Analog Input Channel 4	48	Speed Input 2
21	CAN 1 High	49	Speed Input 3
22	CAN 1 Low	50	Speed Input 4
23	CAN 2 High	51	Video Input 4
24	CAN 2 Low	52	Video 0V Reference
25	Analog Input 0V Reference	53	LIN Bus
26	Analog Input 0V Reference	54	Speed 0V Reference
27	Headphone 0V Reference	55	ED10M Recovery
28	CAN 3 High		

10.1 Function Pin Assignments

Power:

Pin	Channel Name
1	14V Supply +
2	Ground -
5	14V Backup Supply +

Sensor Supply :

Pin	Channel Name
10	Sensor Supply: 5.0V
11	Sensor Supply: 5.0V
12	Sensor Supply: 5.0V
4	12V Regulated Output

Gigabit Ethernet Communications T-568A Standard :

Emtron Pin	RJ45 Pin T-568A	Description	Cat5e Wire Colour
3	-----	Ethernet Shield	-----
6	1	Ethernet Tx/Rx + Pair 1	Green/White
7	2	Ethernet Tx/Rx - Pair 1	Green
13	3	Ethernet Tx/Rx + Pair 2	Orange/White
14	6	Ethernet Tx/Rx - Pair 2	Orange
8	4	Ethernet Tx/Rx + Pair 3	Blue
9	5	Ethernet Tx/Rx - Pair 3	Blue/White
15	7	Ethernet Tx/Rx + Pair 4	Brown/White
16	8	Ethernet Tx/Rx - Pair 4	Brown

NOTE: The Orange/White and Brown/White can often look very similar in colour so make sure the correct wire is used.

CAN Communications :

Pin	Channel Name
21	CAN 1 High
22	CAN 1 Low
23	CAN 2 High
24	CAN 2 Low
28	CAN 3 High
29	CAN 3 Low
30	CAN 4 High
31	CAN 4 Low

RS232/LIN Communications :

Pin	Channel Name
40	RS232 Transmit Output
41	RS232 Receive Input
42	RS232 0V Reference
53	LIN Bus

** See Important Wiring Notes below.

Analog Inputs :

Pin	Channel Name
17	Analog Input Channel 1
18	Analog Input Channel 2
19	Analog Input Channel 3
20	Analog Input Channel 4
32	Analog Input Channel 5
33	Analog Input Channel 6
34	Analog Input Channel 7
35	Analog Input Channel 8
25	Analog Input 0V Reference
26	Analog Input 0V Reference

Speed Inputs :

Pin	Channel Name
47	Speed Input 1
48	Speed Input 2
49	Speed Input 3
50	Speed Input 4
54	Speed 0V Reference

Video Inputs :

Pin	Channel Name
43	Video Input 1
44	Video Input 2
45	Video Input 3
51	Video Input 4
52	Video 0V Reference

Audio :

Pin	Channel Name
36	Headphone Output LH
37	Headphone Output RH
27	Headphone 0V Reference
38	Mic Input LH
39	Mic Input RH
46	Mic 0V Reference

10.2 Important Wiring Notes

14V Switched Supply (Pin 1)

This is a switched 14V supply. Constant power should not be supplied on this pin.

14V Backup Supply (Pin 5)

A Constant 14V supply should be wired to this pin. When the power is removed from pin "14V Switched Supply" the ED10M automatically switches to the "14V Backup Supply" to keep itself powered. This will allow the ED10M to complete critical tasks before shutting itself down (for example data logging storage).

NOTE: When the "14V Backup Supply" is wired to the ED10M, no additional current is drawn when the device is OFF.

Analog Sensor 0V Reference (Pin 25, 26)

As the name indicates these should be connected directly to the 0V (Ground) pin on any low current analog sensor, for example Pressure or Temperature.

- **DO NOT** connect these pins directly to the Engine Block or ED10M Ground. These are dedicated and specialised ground outputs for all analog channels and should be connected directly to the sensor.
- **DO NOT** connect speed-based sensors to this ground, use the Speed 0V Reference Pin 51.

Mic 0V Reference (Pin 46)

This is a dedicated 0V reference for the microphone. **DO NOT** share this pin!

Video Input Config

x4 Composite Video

x2 S-Video - Y input on AIN1; C input on AIN2), (Y input on AIN3; C input on AIN4)

RS232 Communications

Pin 40 is the ED10M RS232 Transmit Output. As the name suggests this is an Output and should be connected to the Receive Input of the wired external device.

Pin 41 is the ED10M RS232 Receive Input. As the name suggests this is an Input and should be connected to the Transmit Output of the wired external device.

This is the wiring standard when working with RS232 communications.

ED10M Recovery (Pin 55)

In the unlikely event the SOM becomes bricked after a software update, grounding this pin at power-on allows the device to be recovered by loading software through the USB Port.(Normally this would be done over Ethernet using the Display Editor software)